

Water Supply Activity Management Plan 2018



Quality Assurance Statement

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1 Executive Summary

1.1 What We Do

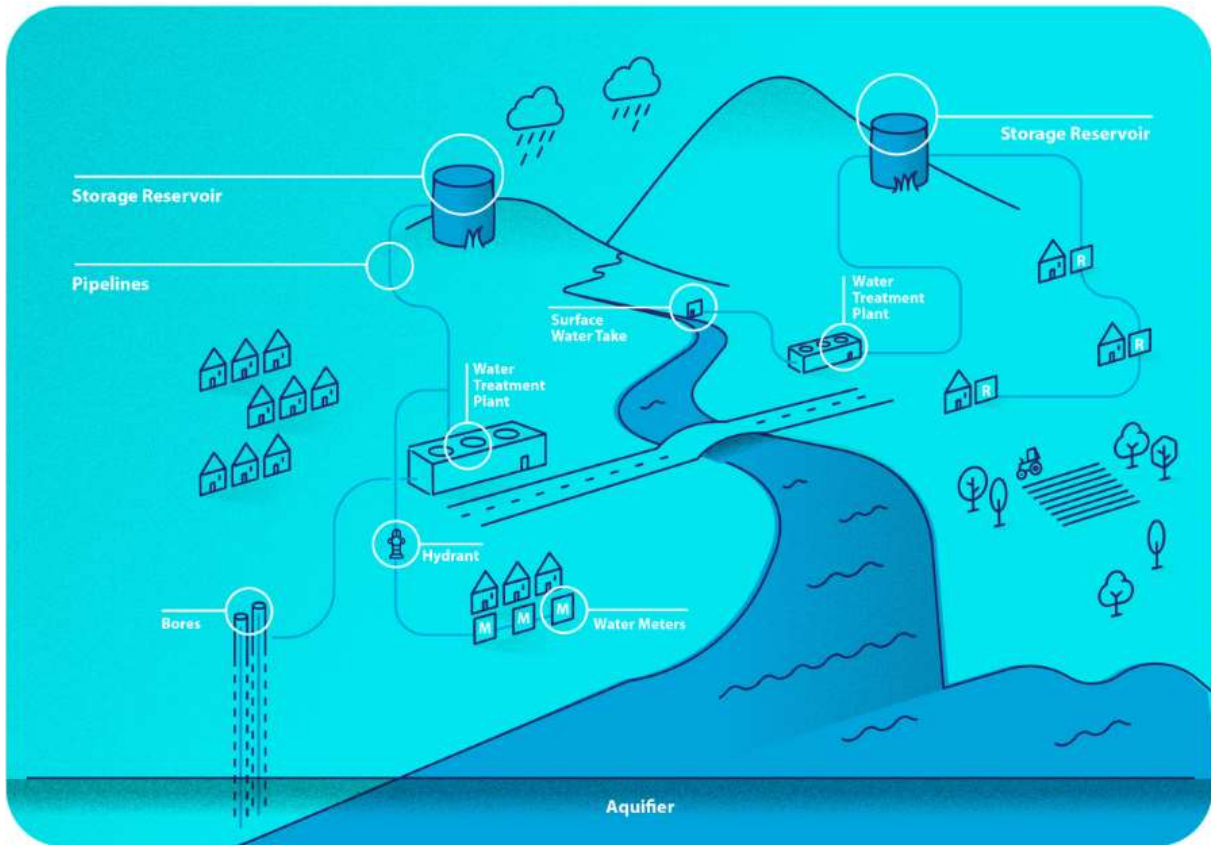
This activity comprises the provision of potable water (i.e. water suitable for use and consumption by people) to properties within 18 supply schemes. This consists of 11 urban water supply schemes (known as the urban water club), Motueka water supply scheme, four rural supply schemes (Dovedale, Eighty-Eight Valley, Redwoods 1 and 2) and the Hamama neighbourhood scheme. The Mapua Rise Water Scheme was transferred to Council in May 2017. In addition, the Takaka Firefighting Scheme supplies the central Takaka area with a non-potable firefighting supply.

Council's existing network is extensive and continuing to grow. At present, the network comprises 15 water treatment plants, 21 pump stations, 756km of reticulation pipeline, 61 reservoirs, 32 bores, 11,200 metered connections and 1,520 rural restrictors. In addition, Council manages the Wai-iti water storage dam to provide supplementary water into the Lower Wai-iti River and aquifer. This enables sustained water extraction for land irrigation at times of low river flows.

Council aims to provide a continuous supply of water to its users but this cannot always be guaranteed.

The following diagrams summarises the key components of the water supply activity.





1.2 Why We Do It

We aim to provide and maintain water supply systems to communities in a manner that meets the levels of service.

Clean and safe drinking water is fundamental to public health. Council provides ready access to high quality drinking water in the urban areas to enhance the health of Tasman's communities. Ready access to water also facilitates economic growth and enables the protection of property through the provision of water at a pressure adequate for firefighting needs. The service provides many public benefits and Council considers it necessary and beneficial to the community to undertake the planning, implementation and maintenance of water supply services in the District. Territorial authorities have numerous responsibilities relating to the supply of water. One key responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the District.

1.3 Levels of Service






Council aims to provide the following levels of service for the Water Supply activity:

"Our water takes are sustainable."	"Our use of the water resource is efficient."	"Our water is safe to drink."
"Our water supply systems provide fire protection to a level that is consistent with the national standard."	"Our water supply systems are built, operated and maintained to that failures can be managed and responded to quickly."	"Our water supply activities are managed at a level that the community is satisfied with."
"Our water supply systems are designed and operated to be resilient."		

Providing safe and secure infrastructure services is a priority for Council. Council plans to invest \$21 million in new and upgraded water treatment plants between 2018-2025. Council are also planning to invest in proactive leak detection and repairs, and on-going pipe renewal in order to reduce water loss. These investments should lift Council's performance against its agreed levels of service.

1.4 Key Issues

The most important issues for this activity and how Council is planning to respond are summarised below.

KEY ISSUE	COUNCIL RESPONSE
 <p>Water sources for community water supplies in the Waimea Basin and Dovedale are not secure</p>	<p>The construction of the proposed Waimea Community Dam is Council's preferred option to provide a secure water source for the Waimea Basin, this will enable Council to provide an increased level of service to existing customers, provide water for new customers; and address the environmental flow issues in the river system. \$24 million has been allocated in year one (2018/19) as Council's contribution to the WCD.</p> <p>Council plans to construct a new bore by the Motueka River. This will enable Council to provide a secure groundwater source for the Dovedale scheme. The bores will be accompanied by a new water treatment plant. This will enable Council to provide customers with increased water quality. \$3.1 million has been allocated between 2018 – 2025 to address water security and quality.</p>
 <p>Meeting the Drinking Water Standards New Zealand (DWSNZ)</p>	<p>In order to comply with the DWSNZ, Council need to upgrade existing or build new water treatment plants (WTP). There are 13 WTP projects planned between 2018-2025. The first two projects are new WTPs for Motueka and Wakefield. These are followed by a major upgrade to the Brightwater WTP and upgrades to the remaining treatment plants. Council staff are focused on completing Water Safety Plans to specifically identify and address the risk for each water supply.</p>
 <p>Meeting residential and commercial growth demand is a challenge in some key areas.</p>	<p>Enabling growth is a priority. Council plans to provide new water infrastructure in Richmond and Motueka and infrastructure upgrades in Mapua/ Ruby Bay.</p>
 <p>Asset information needs improving to allow better asset management and to facilitate sound decision making</p>	<p>Improving asset information is long-term strategic process. Council plans to conduct regular condition assessments; improve data requirement specifications in the Land Development Manual; develop asset data standards, and work towards adopting proposed metadata standards.</p>
 <p>Currently Council does not meet the performance targets in five of the urban water supplies and improvements are required</p>	<p>Council is committed to a proactive approach to network water loss and have increased the operational budget for Demand, Flow & Leak Management to \$150k per annum. This budget will help target water loss by enabling funds for targeted leak detection surveys, day/ night flow monitoring and other network modelling to identify sources of water loss.</p>

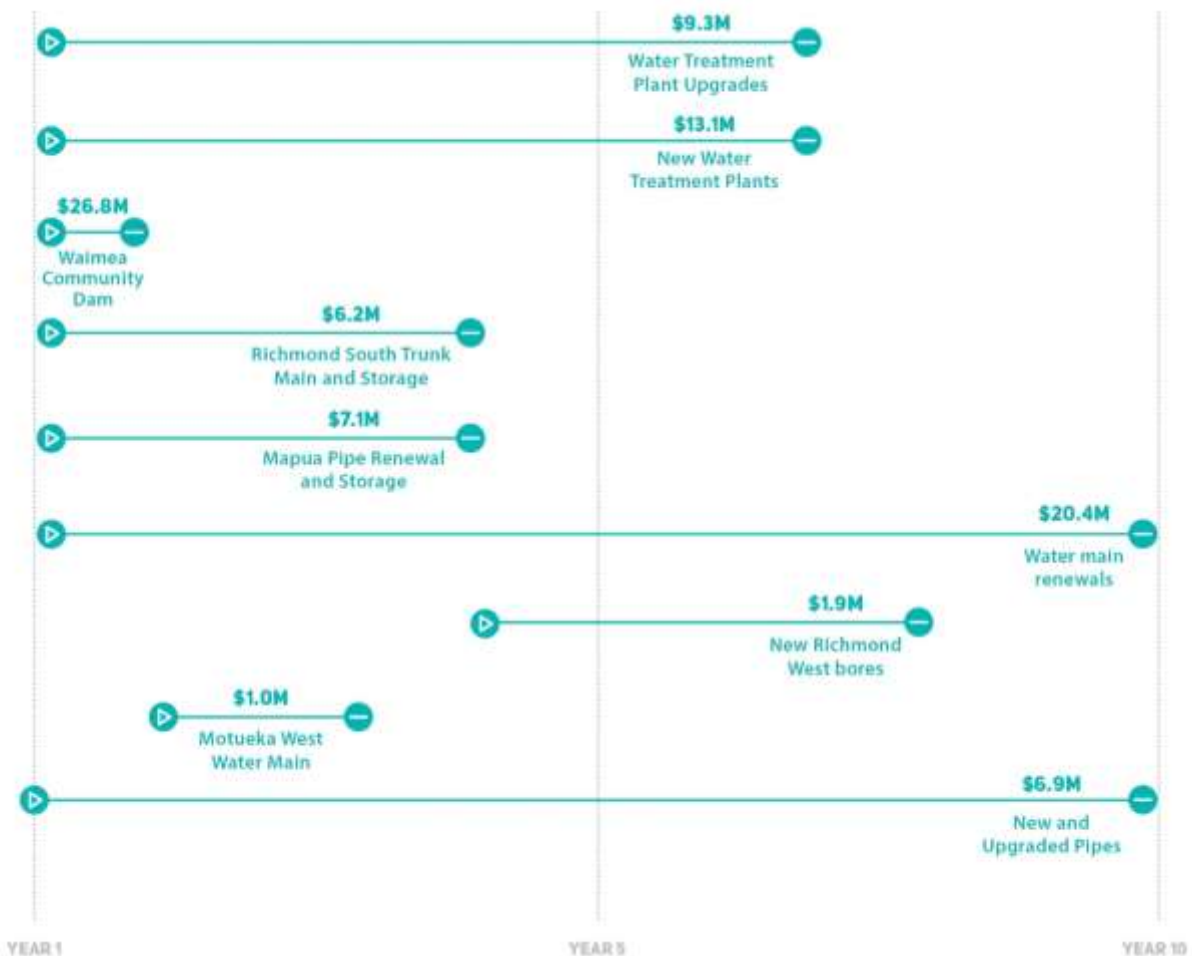
1.5 Operational Programme

The operations and maintenance programme covers all day to day activities that are required to manage the water supply activity. Council plans to spend around \$5 million per year over the next 10 years. The major activities in this programme and the forecast spend over 30 years is summarised below.



1.6 Capital Programme

Council plans to spend around \$90 million on capital improvements over the next 10 years. Of this 16% is attributed to growth, 51% for level of service improvements, and 33% for asset renewal. Council will invest most in level of service improvements for the first four years. This is due to the planned water treatment plant upgrades which are required to meet the NZ Drinking Water Standards. Council anticipates that the majority of investment being made to enable growth will be required within the first four years. After this, there should be sufficient capacity within the majority of the water supply network to enable growth for the next 20 years. Beyond the next 20 years, it is likely that additional infrastructure will be required to enable growth in the elevated areas of Richmond South. Accordingly, Council has planned to install high level reticulation and storage in Richmond South between 2040 and 2044. Long term, capital expenditure notably increases in Year 26 to Year 30 timeframe. This is due to the Motueka and Marahau new town supplies. **Note, Council's share of the capital cost for the Waimea Community Dam is \$26.8 million. The cost to Council's water supply activity is \$9.58 million including inflation.**



1.7 Key Changes

Key changes between the 2015 Activity Management Plan and the 2018 plan are summarised in Table 1 and Table 2 below.

Table 1 Summary Key Changes to Capital Programme

Key Change	Reason for Change
Growth projects brought forward in the capital programme	Growth is happening faster than Council expected. Generally, water supply infrastructure needs to be in place before residential and commercial development can occur. Mapua and Richmond have several projects that have been brought forward to meet projected demand. Council has also added a new project to construct a water main to Motueka West that was not identified in the previous AMP.
Council has given priority to water treatment plant upgrades. These projects are also estimated to cost more due to increased treatment requirements.	Council considers water quality to be a priority and have planned \$21 million for 13 treatment projects between 2018 and 2025. The previous programme budgeted \$10 million for treatment projects over a longer timeframe. The scope of treatment plant projects are more complex and expensive than Council previously estimated.
Reticulation & storage projects brought forward to address growth and resilience	New and upgraded reticulation projects have been prioritised depending on their urgency. New township reticulation programme for Motueka & Marahau have been deferred.
Delays with the Waimea Community Dam (WCD) project	The 2015 AMP planned to contribute \$21 million over five years to the WCD, with \$13.5 million to be spent by the end of the 2017-18 financial year. This did not occur as planned. The 2018 AMP has budgeted \$26 million in Year 1 for Council's share of the WCD capital costs.

Table 2 Summary Key Changes to Operations and Maintenance Programme

Key Change	Reason for Change
Delays with the Waimea Community Dam project	In the previous AMP, Council planned that the WCD would be fully operational by 2019. There have been unexpected delays, and this has not occurred. Council plan for the WCD to be fully operational by 2021/22. The proposed budgets reflect more accurate operational estimate and the new timing.
Increase budget for demand, flow and leak management	Council plans to take a proactive approach to network water loss and have increased the budget for Demand, Flow & Leak Management to \$150k per annum. This budget will be used for leak detection surveys, day/ night flow monitoring and other network modelling.
Increased budget for backflow prevention	Council have included an annual budget for backflow prevention testing. This will be used to test key sites to prevent potential water supply contamination.
New budgets for strategic studies	Council has included new budgets for strategic studies for the district wide initiatives to improve infrastructure risk, resilience and recovery for water supply assets.

1.8 Key Risks and Assumptions

There are factors outside of Council's control that can change, these have an impact on Council's ability to do what it planned. Sometimes the impact can be significant. There is always uncertainty in any planning process but the key to good quality planning is to make clear assumptions to help address this uncertainty. The key risks and assumptions that relate to this activity are:

- Council cannot be certain what the actual climatic conditions of the future will be, nor the demand for community water supplies, but has assumed both will increase. Council has instigated a process to secure an augmented water source in the Waimea Basin to address the risks associated with drought, increasing demand, and existing over subscription of the aquifers. **Council's preferred solution is the construction of the Waimea Community Dam.** Council has assumed that the dam will be built as planned. If this is not the case, Council will need to implement an alternative urban water augmentation solution or demand management measures to address the risk and demand. Costs of alternatives may be more than those budgeted for Council's contribution to the dam. Without the dam, there will be greenfield growth areas in Brightwater, Richmond and Mapua that Council will not be able supply water to. **In a 'no dam' scenario, there will be associated infrastructure planned for these areas that will no longer be necessary, or the timing may be delayed until an alternative water supply source is found.**
- Central Government is currently considering a Bill, which if passed would give power to District Health Boards to make decisions and give directions about the fluoridation of local government drinking water supplies in their areas. It is unclear whether the Bill will be successful and what the actual implications for Council will be. For this AMP, Council has assumed that its drinking water supplies will not be fluoridated. If the bill is passed and the Nelson Marlborough District Health Board instructs Council to fluoridate its supplies, it will create additional capital and operating costs.
- An inquiry into the Havelock North drinking water contamination incident has been undertaken by the Government. Recommendations have been released but uncertainty remains about which of these recommendations will be made mandatory. Some recommendations **relates to water from previously 'secure' sources' and network disinfection (permanent chlorination).** Council is planning to incorporate emergency chlorination in its water treatment plant upgrades. Council has not planned for permanent chlorination. If the Government requires continuous chlorination of all drinking water supplies, it is estimated this would require **additional capital expenditure of approximately \$1 million to apply this to all of Council's urban water schemes** and an increase in annual operating expenditure of approximately \$50,000 per annum.
- Council cannot be certain about the quantity of water that industrial users will require. Council has assumed that future consumption by existing industries will be in line with historic use. Council has planned for one additional wet industry in a medium growth scenario and two wet industries in a high growth scenario. If consumption is significantly different than assumed, it may have an impact on Council's **funding requirements.** If growth is significantly different to the medium or high projections, the number of wet industries may be different.
- Council cannot be certain how long each individual asset will last. To address this uncertainty, Council assigns an average expected life for types of assets to assist with renewal planning. Some assets will fail before reaching the end of their expected life useful life, and some will last longer. Council has assumed that it will be able to manage this variance within its budgets it set by prioritising renewals annually.

2 Introduction

The purpose of this activity management plan is to outline and to summarise in one place, Council’s strategic management and long-term approach for the provision and maintenance of its Water Supply activity.

2.1 Rationale for Council Involvement

The provision of water supply services is considered to be a core public health function of local government and is something that Council has always provided. The service provides many public benefits and it is considered necessary and beneficial to the community that Council undertakes the planning, implementation and maintenance of water supply services in the district.

Territorial authorities have numerous responsibilities relating to the supply of water. A key responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the District. This implies that, in the case of the provision of potable water, councils have the obligation to identify where such a service is required, and to either provide it directly themselves, or to maintain an overview of the supply if it is provided by others.



This document outlines and summarises Council’s strategic and long-term management approach for the provision and maintenance of potable water supplies to properties throughout the District (excluding those that service single premises that have their own rainwater tanks or bores).

2.2 Description of Assets & Services

Table 3 below provides an overview of the water supply networks assets and valuation data (as of April 2017).

Table 3: Summary of Water Supply Assets

Water Supply		Replacement Value	Depreciated Value
	15 Water Treatment Plants	\$6.5M	\$5.9M
	21 Pump Stations	\$16.4M	\$6.9M

Water Supply	Replacement Value	Depreciated Value
	756km of reticulation pipe	\$118.8M
	4548 Valves	\$3.3M
	1437 Hydrants	\$3.3M
	117 Backflow Prevention	\$0.3M
	61 Reservoirs	\$21.5M

Water Supply		Replacement Value	Depreciated Value
	11,199 Meters	\$5.2M	\$2.3M
	1522 Rural Restrictors	\$0.4M	\$0.1M
	32 Bores	\$0.9M	\$0.3M
TOTAL VALUE OF OTHER ASSETS		\$ 2.3 M	\$ 1.7 M
TOTAL VALUE OF WATER SUPPLY ASSETS		\$171.3M	\$104.8M

2.2.1 Water Supply Scheme Overview

There are 18 water supply schemes within the District. The table below provides a summary of the schemes, a classification of the type of supply, and the size of the scheme as classified by the Health Act 1956. The following sections provide a high-level overview and description of the water supply schemes. Detailed information about each scheme is available in **ActiveManuals™** for those staff and contractors that require access to more technical information about specific assets.

Table 4: List of Water Supply Schemes

Urban Metered	Rural Restricted	Other Schemes	Size of Scheme
Brightwater/Hope	Brightwater Rural	N/A	Minor
Collingwood	N/A	N/A	Small
N/A	Dovedale	N/A	Small
N/A	Eight-Eight Valley	N/A	Small

Urban Metered	Rural Restricted	Other Schemes	Size of Scheme
N/A	N/A	Hamama	Neighborhood
Kaiteriteri/Riwaka	N/A	N/A	Small
Mapua Rise	N/A	N/A	Small
Mapua/Ruby Bay	Mapua Ruby Bay Rural	N/A	Minor
Motueka	N/A	N/A	Minor
Murchison	N/A	N/A	Small
Pohara	N/A	N/A	Small
N/A	Redwoods 1 (Golden Hills)	N/A	Small
N/A	Redwoods 2 (O'Connor Creek)	N/A	Small
Richmond	Richmond Rural	N/A	Large
N/A	N/A	Takaka (fire-fighting)	N/A
Tapawera	N/A	N/A	Small
Upper Takaka	N/A	N/A	Neighborhood
Wakefield	Wakefield Rural	N/A	Minor

2.2.2 Water Supply Scheme Descriptions

Brightwater/Hope

The Brightwater supply was constructed in 1976 and serves the Brightwater urban area, the Main Road Hope area and the following rural extensions areas:

- Mt Heslington Road to the lower end of the Eighty-Eight Valley Rural scheme at River Terrace Road;
- Teapot Valley;
- Jeffries Road;
- Hope (e.g. Paton's Road and Pugh's Road) (largest extension).

The scheme takes water from three bores located in a vineyard close to the Wairoa River, just south of the Brightwater Bridge (SH6).

From the bores, water is pumped to a water treatment plant on the other side of the state highway. Here, water is chlorinated in line before entering a contact tank. Three high lift pumps extract water from the contact tank and deliver it to the town and the reservoirs.

The town's two main reservoirs are located above Katania Heights to the south-west of the town. Adjacent to the main reservoir a subdivision is supplied by a booster pump station which runs on demand.

In the event of an emergency, water can be diverted from either the Richmond Water Supply or the Wakefield Water Supply for a short period.

The supply serves a mix of urban and rural lifestyle/agricultural properties with few commercial properties. There are 1068 metered connections (December 2017) and 299 restricted rural connections (June 2017), and a total estimated population of approximately 2,100.

During periods of heavy rain the Wairoa River becomes dirty which affects the bore water quality. The higher turbidity water reduces the effectiveness of the chlorination. In the past (April 2017) this has lead to Council to issues a Boil Water Notice.

This scheme is subject to TRMP rationing rules associated with the Waimea Community Dam. If the dam does not proceed, users of this scheme are likely to experience increased rationing restrictions.

Collingwood

The Collingwood water supply was constructed in 2003 and commissioned in January 2004. A shallow bore situated beside the Aorere River supplies water for the Collingwood water supply. The bore is located about 3km south of Collingwood off the end of Swamp Road. The groundwater source is considered unsecure because the bore is less than 10m deep and the bore head is subject to flooding from the Aorere River. A stout rail fence keeps stock away from the bore head and the pump controls are elevated above the 50 year flood plain.

There are 229 metered connections (December 2017) and one small rural extension at the end of Beach Road. The permanent residential population of Collingwood is approximately 244 people.

Dovedale

The Dovedale water supply is obtained from Humphries Creek, a tributary of the Dove River. There are two surface intakes on the stream - **the 'upper intake' located close to the headwater of the stream and the 'lower intake' located fairly close to the confluence with the Dove River.** The lower intake is only used during peak summer demand.

The Dovedale water supply covers a large rural area, supplying properties in the Dovedale, Rosedale and Upper Moutere areas. The reticulation is approximately 150km in length. The area is very hilly and pumping costs are quite high. Most of the reticulation is on private land and access to some sites is difficult especially in winter.

Thorns Reservoir receives water by gravity from the intake from where it is pumped to Silcocks Reservoirs. These two reservoirs are the two main storage facilities for the scheme. Between the WTP and Thorns, there are 3 pump stations which boost water up to smaller high level reservoirs. From Silcocks the Upper Moutere and Rosedale area are fed by gravity with the water passing through numbers break pressure tanks.

The WTP is located on Dovedale Road near the confluence of the Humphries Creek and Dove River. Treatment consists of inline chlorination. There has been a permanent boil water notice in place since 1989. This is due to the poor quality of the source water (high turbidity), especially during heavy rain.

There are no metered connections and 302 restricted rural connections (December 2017). Many of the connections are to rural farm tanks, with a few to commercial properties. The number of connections is not in direct relation to the estimated supplied population. The estimated population of Dovedale is approximately 450-500 people. Dovedale water supply is fully allocated and there is a waiting list to connect to it.

The scheme was constructed in 1977 as a stock water/farming supply with a 1:1 Government subsidy. Since this time, the scheme has expanded.

Logging operations on the private land surrounding the intake are planned to commence in 2024/25 and Council is concerned about the effect on water quality and quantity. Council is planning to construct a new bore and WTP to provide a secure ground water source and improved water quality.

Eighty Eight Valley

The Eighty-Eight Valley rural **water supply's source is an un-named stream** locally known as Parkes Stream which is a tributary of the Eighty-Eight Valley Stream. The intake is located in native bush in Department of Conservation (DoC) administered land at a level of 230m above sea level. Water flows from this source by gravity to reservoirs (4 x 30,000 litre plastic tanks) at Totara View Road.

The treatment plant is located on a farm in Eighty Eight Valley. Treatment consists of chlorination only. When there is heavy rain in the Richmond Ranges, the source water can become dirty which reduces the effectiveness of the chlorination.

The Eighty-Eight Valley water supply serves the rural farming area from Parkes Stream to Totara View area and mainly lifestyle blocks and small farms from Totara View to Mt Heslington.

There are 2 a closed valve that link the scheme with Brightwater and the Wakefield scheme.

The Waimea County Council constructed the Eighty-Eight Valley rural scheme in 1981 with assistance from local farmers/landowners, and since then the scheme has expanded.

There are no metered connections and 193 restricted rural connections (December 2017). Based on the restrictor numbers, the population of Eighty-Eight Valley is likely to be about 450 people. Some of the restrictors are to rural farm tanks and do not supply domestic properties. The Eighty-Eight Valley water supply is fully allocated and there is a waiting list to connect to it.

Hamama

The Hamama water supply system was installed, paid for and administered by a group of local farmers through the Golden Bay County Council during the late 1950s. The water is not treated and has been classed as a non-potable supply, intended mainly for stock use. It is likely that numerous domestic properties are connected, and the water is used for drinking. The Health (Drinking Water) Amendment Act 2007 (HDWAA) would probably quantify the scheme as a 'neighborhood drinking water supply'. Therefore, the regulations of the HDWAA and the DWSNZ would most likely apply to the scheme.

The stream catchment is an 80 hectare area of land owned by Council and designated as a water supply reserve area. A user committee operates the supply under a Golden Bay County Council bylaw. Council rates the supply area to provide maintenance and operations funding for the management committee but has no direct involvement in maintaining the scheme.

The scheme was originally designed for 10 farms, but demand has grown considerably with rural subdivision and now it is reported that the system operates at its maximum capacity in the dry periods during the milking season. There are **currently 24 connections registered in Council's billing database. When the road was re-laid in 2007 all of these connections were re-done, with new toby boxes and double check valves.** The population of Hamama is approximately 60 people.

Kaiteriteri

The Kaiteriteri water supply obtains water from a bore at River Road in Riwaka, which is located in the road reserve approximately 200m from the state highway intersection. The Kaiteriteri source bore does not currently meet the security requirements and will be upgraded soon.

The system has three supply zones, namely:

From River Road bore to the No. 1 booster (prior to the main reservoir). This includes Riwaka and Riwaka-Kaiteriteri Road as far as the No. 1 booster pump.

From No. 1 booster pump to the main reservoir. This includes Tapu Bay, Stephens Bay, Lower Kaiteriteri, Breaker Bay and Honeymoon Bay.

From No. 2 booster to the high level reservoir. This includes all the high level areas of Kaiteriteri above Honeymoon Bay.

The Kaiteriteri water supply was constructed in 1998. All properties at Tapu Bay, Stephens Bay, Little Kaiteriteri, Breaker Bay and Honeymoon Bay are connected to the scheme, although not all of these properties use the water as some prefer to use their original rainwater storage supply. The supply also serves two large camping grounds that significantly increases demand in summer. These campgrounds have a capacity to house 1,800 people.

Some properties between the bore and Riwaka are connected to the scheme on a voluntary basis. There are no difficulties with the performance of the system. Water quality is corrosive which if left unresolved may reduce the life expectancy of some assets. There is currently only one well, but a spare pump is held in store nearby. There are 621 metered connections in use (December 2017) and no rural extensions off the Kaiteriteri scheme.

As Kaiteriteri is a holiday destination, some of the properties which use water are not inhabited throughout the year. This inference can also be seen through the average water use and by looking at individual water meter accounts. Water consumption significantly increases in the peak summer weeks between Christmas and the first weeks of January.

There are 608 metered connections in Kaiteriteri, although the estimate permanent population of Kaiteriteri is approximately 420 people, although it is estimated that over peak holiday periods (when holiday homes are used, and the camp is full) the population swells to over 2,000.

Mapua Rise

The Mapua Rise water supply scheme is a temporary facility that services an 80 section subdivision. It will not be required when the Mapua/Ruby Bay scheme is upgraded. It has a deep bore producing 1.2L/second and is filtered and pumped to a small storage tank that services the reticulation area.

Mapua/Ruby Bay

Mapua and Ruby Bay zones are part of the Waimea water supply. Following the construction of the Richmond WTP, the scheme was re-configured.

Water is sourced from five bores along the Waimea River stop bank. These deliver water to a balance tank at the Waimea WTP in Lower Queen Street. Two transfer pumps extract water from the balance tank and pump it into 3 contact tanks. The water is chlorinated inline before the contact tanks and dosed with lime (for pH correction) before being pumped across Rabbit Island to Mapua.

The Mapua/Ruby Bay zone serves a mix of urban and rural properties with some commercial use connections. There are 995 metered connections (December 2017) and 238 restricted rural connections (December 2017), and a total estimated population of approximately 2,238.

The Mapua/Ruby Bay zone starts on Lower Queen Street and covers the golf course and houses on Best Island, Bell Island wastewater treatment plant, public facilities at Rabbit Island and the urban area of Mapua and Ruby Bay. The main reservoirs are located at Pomona Road. A pump station at the Pomona Road Reservoirs boost water up to a high level reservoir site at Stage Coach Road. This reservoir supply water to the rural extension areas of Old Coach Road, Marriages Road, Seaton Valley Road, Ruby Bay Bluff and Permin Road areas.

A small pump station on Brabant Drive boosts water up to a reservoir site and pump station at Pine Hill Heights. This supplies water by both gravity and pressure system to the Brabant Pine Hills Heights area.

There is also a booster pump at the Mapua Wharf that can be used to increase flow when required. This pump has not been used in many years due to fragile nature of the trunk main.

This scheme is subject to TRMP rationing rules associated with the Waimea Community Dam. If the dam does not proceed, users of this scheme are likely to experience increased rationing restrictions.

No new connections to the scheme can be made until the infrastructure is upgraded.

Motueka

The Motueka township does not have a full urban water supply. Only parts of the urban area are reticulated and connection to this on a voluntary basis. Where there is no reticulated water supply shallow private bores are generally used. Both hydrants on the scheme and firewells provide water for firefighting. The supply is not treated, there is no storage and there are no rural extensions off the scheme.

The original water supply scheme, which supplied the Port Motueka, was built by the Motueka Harbour Board. The Waimea County Council took over the scheme in the 1960s and later extended it into the Motueka Borough via a bulk meter on Trewavas Street (at the Borough/County boundary).

The water is sourced from:

- two bores at the Recreation Centre in Old Wharf Road;
- **a bore at the Fearon's Bush Motor Camp** on Fearon Street (emergency supply only).

Whilst the bores are not considered secure they are more than 10m deep. The Recreation Centre bores are 21.5m deep **with screens starting at 16m and the Fearon's Bush bore is 15m deep with a casing starting at 11m.**

Motueka and Riwaka have approximately 50 fire wells and 70 fire pipes that have to be maintained for firefighting **purposes in areas where there is no reticulation. A connection exists between Council main in Everett Street and Talley's** supply from their well in High Street South. The link is installed with two shut valves, a reduced pressure zone (RPZ) backflow device and a meter. This connection enables flows to be supplied either way for emergencies purposes. There are 1300 metered connections (December 2017) and no restricted rural extension connections. The population of Motueka is approximately 7,200.

Murchison

The Murchison water supply takes water from two bores situated in farmland between the main pump station and the Matakaitaki River. The bores are unsecure because they are less than 10m deep. Stock graze the paddocks where the supplies are located but the bores are protected by stock-proof fencing.

The Murchison water supply services the Murchison urban area, with an extension out to Longford. There are 307 metered connections (December 2017) and 1 restricted connections to the Tasman District Council Stock Effluent Facility. The population of Murchison is approximately 430 people.

Pohara

The Pohara Valley water supply is sourced from a surface intake at Winter Creek. This supplies water to residents in the Pohara Valley and also feeds the Pohara Camp to the west.

The Pohara Valley water supply was originally constructed by the Golden Bay Cement Company and taken over by Tasman District Council when the Golden Bay Cement Company ceased operation.

There are 53 metered connections (December 2017) and no restricted rural extension connections.

Many houses in the area (approximately 70%) are holiday homes/baches.

The largest connection feeds the camping ground. The camping ground can increase population numbers to over a thousand people using the scheme during summer months. The campground is the largest water user and has installed 90m³ of storage as a buffer for emergencies.

Most of the year the scheme is considered a small supply but during months of summer when the campground is busy and the baches are full (mid-December to mid-February) the scheme is considered minor. This means extra monitoring needs to be carried out.

The Pohara water supply scheme is at its maximum limit and any further connections would require new sources of water.

Redwood Valley 1 & 2

The Redwood Valley Rural Water Supply scheme services properties throughout the coastal hill country to the north west of Richmond.

The two schemes can be linked via closed valves in the reticulation and they also share a source. Redwood Valley 1 services the inland Redwood Valley area between Eves Valley and Moutere Highway. Redwood Valley 2 services the coastal area between Moutere Highway and the coast to Bronte Road. Most of the reticulation is on private property.

The Redwood Valley Water Supply Scheme originated when Waimea County Council took over and extended an existing farm scheme (owned by TNL). This was a mainly stock water scheme and covered a large area of farmland that was subdivided into lifestyle properties. This farm scheme became Redwood Valley 1 in 1973 and was changed to a community water supply. As more development occurred in the area, Redwood Valley 2 was built closer to the coast in 1976 to provide water to this area separately.

Redwood Valley 1 takes water from a well at Golden Hills Road where the treatment plant is located. Redwood Valley 2 takes water from two bores close to O'Connor Creek on the Coastal Highway, where a second treatment plant is located. A supplementary bore was installed at River Road in 1997. This bore supplies water to both Golden Hills Road and O'Connor Creek treatment plants where it is mixed with the on-site source waters during treatment.

The bores/wells are considered unsecure because they are less than 10m deep.

There are no metered connections on either scheme, Redwood Valley 1 has 97 restricted connections and Redwood Valley 2 has 265 (2015). Not all of the connections within the schemes are to residential properties. Several are to vacant lots yet to be developed and many are to business /commercial /agricultural premises. The registered population of Redwood Valley 2 is 370 people and the registered population of Redwood Valley 1 is 180. The Redwood 1 & 2 schemes are fully allocated and there is a waiting list to connect to them.

There is a Management Committee made up of elected local representatives which assists Council with scheme administration and reports to the Engineering Services Committee.

This scheme is subject to TRMP rationing rules associated with the Waimea Community Dam. If the dam does not proceed, users of this scheme are likely to experience increased rationing restrictions.

Richmond

Richmond water supply is taken from 2 separate sources: 5 bores at the bottom of Lower Queen Street by the Waimea River and 4 bores adjacent to Lower Queen Street by Nelson Pine Industries. There are also two emergency bores located near the Waimea River.

The 2 water sources are mixed at Richmond WTP and disinfected using UV and pH corrected using caustic soda. Emergency chlorination is also in place. The Richmond source water has elevated nitrate levels and the Waimea source water is slightly corrosive; however mixing the two sources provides a low cost to solution to these issues.

The reticulation service 2 separate zones: Richmond (township) and Waimea Industrial (Wakatu Industrial Estate, houses on either side of Champion Road).

There are 4 main reservoirs that provide storage capacity; these are Champion Road and Queen Street (at the same elevation) and Richmond East High Level and Richmond Upper on Valhalla Lane. There are also smaller reservoirs at Valhalla Drive, Cropp Place and Faraday Rise. On Hart Road there is a system with a reservoir and pump station that takes water from the main reticulation system at night will supply new housing development that is currently being built.

Richmond supply serves approximately 14,000 people in Richmond alone. There are 5660 metered connections and 48 restricted rural connections (December 2017) serving a rural extension in the Haycock Road area.

The Richmond water scheme supplies approximately 8000 m³ -11,000 m³ of water per day. The area has experienced significant growth rates, both in residential and commercial development over recent years. This in part has led to an issue with available water quantity and summer time restrictions.

In the event of an emergency, some water can be supplied from Nelson City Council supply. There is also a closed valve connection to the Brightwater scheme at Three Brothers Corner where water can be supplied either way.

This scheme is subject to TRMP rationing rules associated with the Waimea Community Dam. If the dam does not proceed, users of this scheme are likely to experience increased rationing restrictions.

Takaka

A new FW2 standard firefighting reticulation was installed in Takaka CBD in 2011. It consists of 2 bores and pumps with an emergency generator.

Tapawera

Tapawera is supplied from two bores between the Motueka River and the village on the Tadmor Valley Road. The groundwater supply is unsecure because the bore screens are at a depth of less than 10m. Water is treated with chlorine and UV disinfection; and pH corrected using lime dosing. The water supply network in Tapawera was installed by the NZ Forest Service in 1973, extended by the Council in 1976 and fully handed over to the Council in 1979 and further upgraded. The population of Tapawera is approximately 300 and there are 168 metered connections on the scheme (December 2017). Although one person is supplied water through a low flow restrictor close to the reservoir, there are no rural extensions on the scheme.

Upper Takaka

Upper Takaka water supply takes water from Whiskey Creek. The catchment for the creek is largely an area of steep bush on the northern side of Takaka Hill.

The Upper Takaka water supply was originally built by the New Zealand Electricity Department in the 1950s and was taken over by Council in 1991. The system supplies untreated water to farmland that the pipeline is laid through and treated water to the Upper Takaka township.

There are 19 metered connections (December 2017) and no rural extensions off the Upper Takaka scheme. The estimated population of Upper Takaka is approximately 45 people.

Wakefield

The Wakefield water supply was constructed in 1973 and serves mainly the Wakefield urban area. The Wakefield scheme also supplies the following rural extensions areas:

- Higgins Road;
- Pigeon Valley;
- Spring Grove;
- Treeton Place;
- Wakefield South.

Source water for the Wakefield scheme is extracted from a well with an infiltration gallery close to the Wai-iti River behind the Wakefield fire station. The infiltration gallery is at a depth of approximately 4m.

The current WTP is located close to the well on Pigeon Valley Road. Treatment includes aeration (for pH correction) and chlorination. There is a new source and WTP proposed at Spring Grove, this project will commence in 2018/19.

The Wakefield Water Supply scheme supplies a population of approximately 2,100. All 776 urban connections are metered (December 2017) and the 66 connections from rural extensions are restricted by a low-flow valve.

The two main reservoirs are located on Edward Street behind a church. Treeton Place has a small reservoirs and pump station to supply an area above the main reservoirs.

The scheme is linked to the Eight-Eight Valley supplied by closed valve on Higgins Road.

The scheme is also linked to the Brightwater scheme via a pipe which runs along the old Railway Reserve with a booster pump station at Bird Road. This connection can be used for emergency supply to either township.

2.3 Fire-Fighting

In urban schemes, the water supply system is designed to meet FW2 Standard from the New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ 4509:2008). In highly commercial, central business district areas, a FW3 standard will be provided at the discretion of Council. Council considers it the responsibility of building owners to provide their own systems if their building requires a higher firefighting standard to be met. There are a number of urban areas (usually associated with an elevated position in relation to reservoirs) that receive marginal or below standard levels of service compared to the code of practice. Performance in these areas cannot be practically remedied without major upgrades. Some areas affected by pipe size may be improved by renewals over time. In the areas of Motueka that are not reticulated, there are several fire wells provided for firefighting purposes. Council does not guarantee that these will meet the requirements of the Code. A new FW3 standard firefighting reticulation was installed in Takaka CBD in 2011. No firefighting capability is provided within rural water supply systems, instead the TRMP outlines water capacity expectation for dwellings in rural areas for fire-fighting purposes.

Table 5: The Supply of Water for Fire Fighting Purposes (SNZ PAS 4509:2008)

Standard	Reticulated Flow (l/s)	Max no. hydrants from which the required flow is to be obtained within a 270m radius	Max. spacing of fire hydrants	Reserve storage capacity or alternative supply in water supply scheme
FW2	25	2	135 m	0.5 hour at 25l/s 45,000 litres
FW3	50	3	135 m	1 hour at 50l/s 180,000 litres

The following work will be undertaken to check compliance against the code:

- an audit of fire hydrants throughout the District;
- the fire wells in Motueka to be tested annually;
- hydraulic modelling will be undertaken for key urban water supply systems. The fire flows will be assessed as part of this exercise to check against the code of practice. The current hydraulic models will be maintained and recalibrated on a regular basis.

3 Strategic Direction

Strategic direction provides overall guidance to Council and involves specifying the organisation's objectives, developing policies and plans designed to achieve these objectives, and then allocating resources to implement the plans.

3.1 Our Goal

We aim to provide and maintain water supply systems to communities in a manner that meets the levels of service.

3.2 Contribution to Community Outcomes

Council operates, maintains and improves the water supply infrastructure assets on behalf of its ratepayers. The water supply activity contributes to the community outcomes as detailed below.

Table 6: Summarises how this activity contributes to achievement of Council's community outcomes

Community Outcomes	Does Our Activity Contribute to the Community Outcome	How Our Activity Contributes to the Community Outcomes
Our unique natural environment is healthy, protected and sustainably managed.	Yes	All of our water schemes take water from the environment (via surface or groundwater) and require a resource consent. We aim to manage water takes so the impact does not prove detrimental to the surrounding environment.
Our urban and rural environments are people-friendly, well-planned, accessible and sustainably managed.	Yes	We consider water supply to be an essential service to the community and our schemes are designed to be efficiently managed to meet current and future needs. Our networks also provide a means for firefighting consistent with the national firefighting standards.
Our infrastructure is efficient, cost effective and meets current and future needs.	Yes	We aim to efficiently provide water to meet the demands of existing of future customers in a cost effective way.
Our communities are healthy, safe, inclusive and resilient.	Yes	We aim to provide water supplies that are safe to drink and used for firefighting purposes that are delivered and supported by resilient infrastructure.
Our communities have opportunities to celebrate and explore their heritage, identity and creativity.	No	By providing water we don't primarily contribute to this outcome. However, where possible we incorporate community and school groups into the design and provision of infrastructure.
Our communities have access to a range of social, cultural, educational and recreational facilities and activities.	Yes	Water is an essential service that underpins other facilities and activities.
Our Council provides leadership and fosters partnerships, a regional perspective, and community engagement	Yes	We take opportunities to partner with Nelson City Council where possible, including agreements to supply some of the customers with water.

Community Outcomes	Does Our Activity Contribute to the Community Outcome	How Our Activity Contributes to the Community Outcomes
Our region is supported by an innovative and sustainable economy.	Yes	Water underpins the economy by providing water for our communities enabling them to function. We aim to provide sustainable supplies that are built for the future.

3.3 Infrastructure Strategy

Council's Infrastructure Strategy covers the assets needed to support Council's water supplies, stormwater, wastewater, rivers and flood control, and transportation activities.

The purpose of the Strategy is to identify the significant infrastructure issues for Tasman over the next 30 years, and to identify the principal options for managing those issues and the implications of those options.

When setting out how Council intends to manage the District's infrastructure assets and services, it must consider how:

- to respond to growth or decline in demand;
- to manage the renewal or replacement of existing assets over their lifetime;
- planned increases or decreases in levels of service will be allowed for;
- public health and environmental outcomes will be maintained or improved; and
- natural hazard risks will be addressed in terms of infrastructure resilience and financial planning.

There are three parts to the Strategy: the Executive Summary, the Strategic Direction, and the Activity Summaries. The Strategic Direction section sets the direction for infrastructure management and outlines the key priorities that Council will focus on when planning and managing its infrastructure. The Activity Summaries section provides an overview of each activity and is largely a summary of the relevant activity management plan.

The four key infrastructure priorities included in the Strategy are:

- Providing infrastructure services that meet the needs of our changing population
- Planning, developing and maintaining resilient communities
- Providing safe and secure infrastructure and services
- Prudent management of our existing assets and environment

These priorities have been used to determine and prioritise what is required to be included in the programmes of work for each activity management plan.

3.4 Financial Strategy

The Financial Strategy outlines Council's financial vision for the next 10–20 years and the impacts on rates, debt, levels of service and investments. It will guide Council's future funding decisions and, along with the infrastructure strategy, informs the capital and operational spending for the Long Term Plan 2018-2028.

Three key financial limits are established in the Financial Strategy that set Council's overall financial boundaries for its activities. These include:

- Rates Income - limited to \$65 million per annum and targeted rates to \$60 million per annum.
- Rates Increases - limited to a maximum of 3% per annum, plus an allowance for annual growth in rateable properties.
- Debt - net external debt limited to a maximum of \$200 million

Infrastructure expenditure forms a large proportion of Council's spending being 39% of operational expenditure and 80% of capital expenditure over the next 10 years. Because of this, the Infrastructure Strategy and Financial Strategy are closely linked to ensure the right balance is struck between providing the agreed levels of service within the agreed financial limits. Often these financial limits will influence how Council manages and develops existing and new assets. This is especially so for the next 10 years.

Over the next 10 years, forecast rate income increases and debt levels are projected to be near Council's limits. Council has had to work hard to prioritise and plan a work programme which addresses key issues while staying within these limits. Given Council's debt is projected to peak at \$199.6m in Year 2020/21 there is very little scope to add further work programmes in the next five years.

3.5 Key Issues

Council has identified several key issues specific to the water supply activity which are summarised Table 7 below. Each of these issues relate back to Council's infrastructure priorities. For each issue, the significant decisions Council is planning to make is outlined below, along with the principal options for addressing the issue, estimated costs, and timing.

Table 7: Key Issues for the Water Supply Activity

Key Issue	Discussion
Water supply security and capacity	<p>For Council to provide a consistent and reliable water supply to households and businesses it is important that the community has access to secure water sources that provide adequate quantity and quality of water throughout the year. Council has already discussed with the community the lack of a secure water source for the Waimea basin and the risk this presents to those users during dry summer periods. To improve security and long term capacity, Council has identified the Waimea Community Dam as the most suitable and preferred option.</p> <p>The residential and business water users in Richmond, Hope, Mapua/Ruby Bay and parts of Nelson South rely primarily on water extracted from the aquifers on the Waimea Plains.</p> <p>Generally, there is sufficient water available during the winter months; however, dry spring and summer conditions can raise serious water shortage concerns and parts of the District have experienced water restrictions in seven of last ten years. Furthermore, with the predicted changing climates and weather patterns predicted, dry weather has the potential to significantly impact or disrupt these supplies.</p> <p>By building a new dam, that augments the Waimea River and groundwater aquifers, Council will be able to harness the surplus water available in winter months and during intense rain events. This will enable Council to provide customers with consistent and reliable water supply, cater for increasing growth demands and leave the river with a more healthy flow.</p> <p>As well as the Waimea basin, Council has concerns about the security of the Dovedale water scheme source. Factors such as changes in private land use and changing weather patterns present a risk to the availability of this water source.</p> <p>The Dovedale scheme currently takes water from a stream prior to dosing it with chlorine. As well as having a vulnerable source, the quality of the water is very poor, and the scheme has a permanent boil water notice as well as chlorine dosing. External factors such as forestry harvesting, and dry weather have potential to significantly impact or disrupt this supply. By building a new treatment plant incorporating a new groundwater source, Council will be able to provide customers with increased water quality and security.</p>
Improving the safety of our water supplies and meeting the DWSNZ	<p>Council is required by the Health Act to provide safe water supplies that comply with the Drinking Water Standards New Zealand (DWSNZ). Of the 18 supplies that Council operates, only one (Upper Takaka) fully meet the requirements of the DWSNZ. The main reason for non-compliance is a lack of protozoa treatment. Complying with the Standards is not a new issue for Council but one that has increased in priority following recent water contamination issues at Havelock North and the subsequent inquiry.</p> <p>In order to comply with the DWSNZ, Council need to upgrade existing or build new water treatment plants (WTP). New and upgraded WTPs will mean that the cost of providing water will increase in the future. Council has planned a \$21 million water treatment programme between 2018-2025. The first two projects are new WTPs for Motueka and Wakefield. These are followed by a major upgrade to the Brightwater WTP and upgrades to the remaining treatment plants.</p> <p>Council staff are focused on completing Water Safety Plans to specifically identify and address the risk for each water supply schemes.</p> <p>Council has established a local drinking-water working party in response to the Havelock North Inquiry. This was to enhance a better working relationship between parties that have direct inputs into water quality and safety issues. The working party was established in 2017 and meet every quarter. Attendees from Council (Engineering and Environment & Planning) the Nelson-Marlborough District Health Board and the Ministry of Health (MoH) are involved.</p>

Key Issue	Discussion
Meeting growth	<p>Council expects that over the next 10 years Tasman’s population will grow by approximately 4,400 residents. To accommodate this growth new houses will need to be built, most of which will need to be supplied with water. Council can supply some of this new demand through existing infrastructure where capacity is available. New areas of development such as Richmond West, Richmond South and Motueka West will require completely new infrastructure in order to deliver water to the area, or in the case of Mapua, the existing infrastructure will require upgrading to provide additional capacity.</p> <p>Enabling Tasman’s communities to grow is a priority for Council. To enable this, Council has determined that it must provide essential infrastructure, such as water, and has planned to do this in Richmond and Motueka, as well as upgrading infrastructure in Mapua/Ruby Bay.</p>
Asset information: (knowledge, data, metadata, processes and systems)	<p>Council relies on good asset information to make good asset management decisions.</p> <p>Council’s asset data is incomplete and inaccurate. Council relies on staff and operators to fill gaps in knowledge about where assets are located, understand how they operate and identify maintenance requirements. With staff turnover, some of this knowledge has been lost.</p> <p>Poor data limits Councils ability to make sound decisions about the timing of the renewals programme. Accurate age, condition and performance data should underpin the renewals programme and provide certainty and confidence for budgets and planning purposes. Long term financial planning also depends on accurate asset valuation that uses reliable asset data. It can also result in increased operations costs and higher incidence of reactive rather than planned maintenance.</p> <p>A recent review of our asset management systems and data capture process has highlighted a number of opportunities. Improvements includes the development of an As-built Data Standard to better define data requirements and improvement in the accuracy and completeness of data provided from external parties (for newly constructed and replaced assets). This document will be complementary to but sit separate to the proposed Land Development Manual. Council is considering a staged alignment to the NZ Asset Metadata Standards (v1.0). Staff are making internal business improvements to enhance the process of obtaining data (including condition data from contractor’s repairs.</p>
Network water loss	<p>Water loss is a critical factor in managing water network. The percentage of water loss from the Council’s water supply networks is too high, with urban 5 water schemes not achieving the performance targets.</p> <p>At any given time, there will inevitably be losses occurring in some part of the network. How much leakage occurs on any scheme can vary significantly depending on a number of factors including operating pressures, pipe age, pipe material and installation conditions.</p> <p>Measurements used to report water loss represent a snapshot in time. Water loss can escalate quickly and is influenced by several daily and seasonal variations, and consequently water loss results can vary significantly from year to year. For example, a large pipe burst in Mapua can significantly influence the scheme’s annual water loss data. Another example is a recent leak in Murchison, where a small leak on the water main on Fairfax Street significantly affected the overall annual water loss rate for that particular settlement</p> <p>Staff monitor water losses, including monitoring changes in daily water production figures (which is graphed and reported on each week) and night flow monitoring through our SCADA systems.</p> <p>Council is committed to taking steps to reduce water loss. Council have increased the budget for an ongoing leak detection programme. When leaks are suspected, targeted leak detection is carried out to locate leaks using specialised detection equipment and repairs are carried out. Information can be used to help develop renewals programme.</p>

Key Issue	Discussion
Rural water supply - secure source, capacity & quality	<p>Rural water supply schemes have a variety of challenges affecting water capacity and quality. Dovedale and Eighty-Eight Valley require new water sources in the near future in order to secure water supply and meet existing demand. The rural schemes were originally designed as agricultural schemes not intended for domestic purposes; and as such none of the schemes meet the DWSNZ. The costs of capacity and treatment upgrades are high, and the community needs to be consulted to determine whether they want to pay for those upgrades as they are not part of the Urban Water Club.</p> <p>The trend of urban populations moving to lifestyle blocks in the country-side has changed the public's expectation about the supply and quality of water. These expectations may not be realistic.</p> <p>For the Dovedale scheme, Council plans to construct a new bore by the Motueka River. This will enable Council to provide a secure water source and improve security. The bores will be accompanied by a new water treatment plant. This will enable Council to provide customers with increased water quality.</p> <p>Council have planned treatment upgrade for Eighty-Eight Valley in 2021. Options include a new WTP or supply the scheme from Wakefield. These will be discussed with the scheme users.</p> <p>Council have also planned treatment upgrades on the Redwood Valley scheme in 2021. This includes separate projects for Golden Hills and O'Connor Creek WTP.</p>

3.6 Prioritisation

Council cannot afford to undertake all work at once due to financial and resource constraints. This means that Council needs to prioritise what work it undertakes first, and what work can wait until later.

There are multiple factors that affect the priority of individual works. These include:

- The need to protect public health & safety
- Statutory compliance
- **Meeting the needs of tomorrow's population**
- Readiness to implement works
- Co-funding opportunities
- Enabling pleasant community environments
- Benefits and risks
- District distribution
- Strategic fit

Council has taken all of the above into consideration when planning its programme of work. Generally, mandatory requirements such as statutory compliance take priority, and discretionary activities have been programmed second to this.

4 Key Linkages

There are multiple factors that influence how Council manages this activity. They can be internal or external and include legislation, policies, regulations, strategies and standards. This section summarises these key linkages.

4.1 Overview

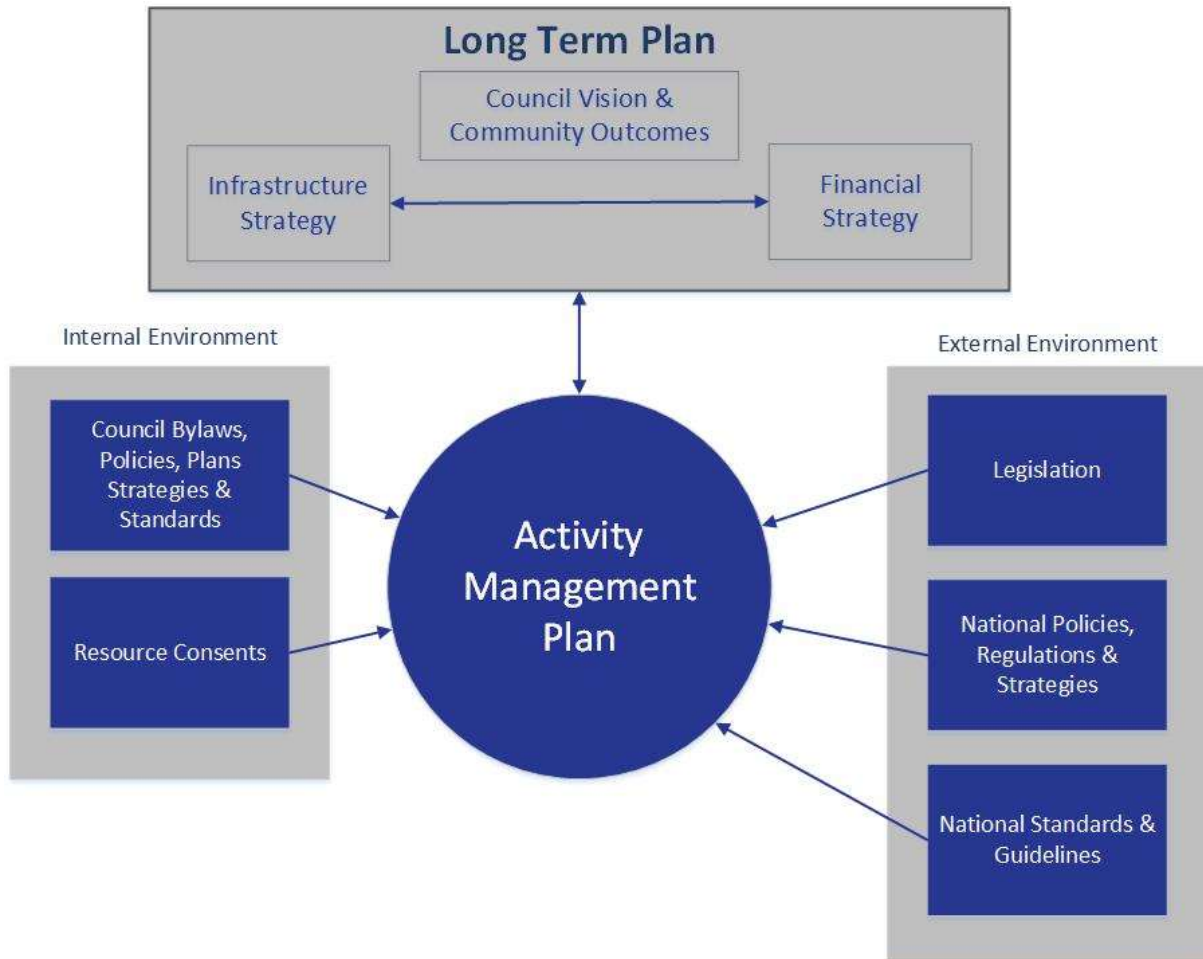


Figure 1: How the Water Supply Activity relates to other documents

In preparing this AMP the project team has taken account of:

- National Drivers – for example the drivers for improving Asset Management through the Local Government Act 2002
- Local Drivers – community desire for increased level of service balanced against the affordability
- Industry Guidelines and Standards
- Linkages – the need to ensure this AMP is consistent with all other relevant plans and policies
- Constraints – the legal constraints and obligations Council has to comply with in undertaking this activity.

The main drivers, linkages and constraints are described in the following sections.

4.2 Key Legislation

The Acts below are listed by their original title for simplicity however all amendment acts shall be considered in conjunction with the original Act, these have not been detailed in this document. For the latest Act information, refer to <http://www.legislation.govt.nz/>

Table 8: Summary of Key Legislation that relates to the Water Supply Activity

Key Legislation	How it relates to Water Supply Activity
The Health Act 1956 Health (Drinking Water) Amendment Act 2007	Places responsibilities on Council to protect the quality and safety of drinking water. Responsibilities include the duty to take reasonable steps to contribute to protection of source of drinking water by preparing and implementing Water Safety Plans (WSP) for schemes supplying over 500 people.
Local Government Act 2002	The Local Government Act requires local authorities to prepare a ten-year Long Term Plan and 30-year Infrastructure Strategy, which are to be reviewed every three years. The Act requires local authorities to be rigorous in their decision-making by identifying all practicable options and assessing those options by considering the benefits and costs in terms of the present and future well-being of the community. This activity management plan provides information to support the decisions considered in the Long Term Plan.
Resource Management Act 1991	Sets out obligations to protect New Zealand's natural resources such as land, air, water, plants, ecology, and stream health. Resource consents draw their legal authority from the Resource Management Act 1991.
Public Works Act 1981	The Public Works Act provides the statutory authority to acquire land for a public infrastructure.
Civil Defence Emergency Management Act 2002	Sets an expectation that Councils services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level of service.
Health and Safety in Employment Act 1992 & 2015	Health and Safety legislation requires that staff and contractors are kept safe at work. New legislative changes to the act will mean improved health and safety measures will be required.
Utilities Access Act 2010	The processes and rules for coordinating work done in transport corridors by utility operators, or that affects utility operators' assets
Fire Service Act 1975	Sets out of the legal obligation for local authorities to supply fire-fighting water within urban areas and section 30 outlines the flow, storage and volume requirements.
Te Tiriti o Waitangi – Treaty of Waitangi	The Treaty of Waitangi is an agreement between Māori and the Crown. Under Section 4 of the Local Government Act 2002 local authorities are required to 'recognise and respect the Crown's responsibility to take appropriate account of the principles of the Treaty of Waitangi and to maintain and improve opportunities for Māori to contribute to local government decision-making processes' . Further sections of the Act, particularly 77 and 81, detail the scale of requirement for local authorities to seek contributions and involvement from Māori in consultation and decision-making processes.

4.3 Key Planning, Policies and Strategies

4.3.1 Key National Policies and Strategies

Table 9: Key National Policies and Strategies that relate to this activity

National Polices, Regulations & Strategies	How it relates to Water Supply Activity
National Policy Statement on Urban Development Capacity 2016 (NPS-UDC)	Sets out the objectives and policies for providing development capacity under the Resource Management Act 1991 and came into effect on 1 December 2016.
National Policy Statement for Freshwater Management 2014 (Freshwater NPS)	Provides direction to local authorities to set objectives for the state of fresh water bodies and to set limits on resource use to meet these objectives.
The Local Government (Financial Reporting) Regulations 2011	Sets out the content of local authorities' annual reports and financial reporting framework and standards.
Sustainable Development for New Zealand - Programme of Action (Ministry of Social Development)	Sets out the Government's approach to achieving sustainable development and specifies an improved provision of infrastructure and services (including water supply, wastewater treatment transport, energy and housing).

4.3.2 National Standards & Guidelines

For the latest standards information, refer to <http://www.standards.govt.nz>.

Table 10: Summary of National Standards & Guidelines

National Standards	How it relates to Water Supply Activity
Drinking-water Standards for New Zealand (DWSNZ) 2005 (Revised 2008)	DWSNZ direct the quality requirements for drinking water provided to consumers. It prescribes the maximum allowable concentrations of potentially harmful contaminants in the water. Drinking water suppliers have a duty to take all practicable steps to provide water of a quality consistent with the standards.
Controller and Auditor General publications: <ul style="list-style-type: none"> Local government: Examples of better practice in setting local authorities performance measures. Local authorities: Planning to meet the forecast demand for drinking water Getting the right information to effectively manage public assets: Lessons from local authorities 	<p>Discussion paper that provides examples of better practice in performance measures within local authorities long term plans.</p> <p>Performance audit report to determine how well prepared local authorities are to meet demand for drinking water.</p> <p>Discussion paper examining how local authorities approach identifying and gathering the asset information.</p>
National Environmental Standards Sources of Human Drinking Water	Guidelines intend to reduce the risk of contaminating drinking water sources by requiring regional councils to consider the effects of activities on drinking water sources in their decision-making.

National Standards	How it relates to Water Supply Activity
New Zealand Fire Service Fire Fighting Water Supplies Code of Practice: SNZ PAS 4509:2008	Requirements to enable the Fire Service to have access to sufficient water during emergencies. Provides up-to-date practices for planning and approving a subdivision, sizing a water storage facility, and when replacing or renewing a water main. Guidance has been provided on water storage facilities in rural areas and detail is included about alternative firefighting water sources.
NZS 4404:2010	Land Development and Subdivision Infrastructure
AS/NZS ISO 9001:2016	Quality Management Systems
AS/NZS 3917:2013	Fixed Term Contract Management
AS/NZS 4801:2001	Occupational Health and Safety Management Systems
AS/NZS 2032:2006	Installation of PVC Pipe Systems
AS/NZS 2280:2012	Ductile Iron Pressure Pipes and Fittings
AS/NZS 3725:2007	Design for Installation of Buried Concrete Pipes
AS/NZS 2566.1:1998	Buried flexible pipelines - Structural design
AS/NZS 2566.2:2002	Buried flexible pipelines - Installation
NZS 3101.1&2:2006	Concrete Structures Standard
NZS 3910:2013	Conditions of contract for building and civil engineering construction
NZWWA New Zealand Infrastructure Asset Grading Guidelines 1999	Provide practical methods for assessing the condition and performance of infrastructure assets, and for determining long-term investment needs for maintaining, enhancing and extending those assets to meet defined levels of service.
New Zealand Pipe Inspection Manual 3rd edition (2006)	An overview of tasks that can be completed using CCTV and how these activities can be used to manage pipe assets.
<p>Department of Internal Affairs publications:</p> <p>Supporting guidance for drinking-water</p> <p>What is Water Loss?</p>	<p>Guidance to help local authorities when setting levels of service and targets related to mandatory performance measures.</p> <p>Guidance to help local authorities define water loss and outline methods to measure it.</p>
<p>Ministry of Health publications :</p> <ol style="list-style-type: none"> 1. The Guidelines for Drinking-water Quality Management for New Zealand 2013 2. Water Safety Plan Guides for Drinking Water Supplies 3. Rural Agricultural Drinking-water Supply Guideline (DWSNZ) 4. Sapere Research Group: The Economic Costs of the Havelock North August 2016 Waterborne Disease Outbreak 	<p>Explains the development of the Standards and provide advice for achieving high level of water quality management. The Guidelines will help water suppliers to achieve the Standards</p> <p>A series of guides covering the system elements that are most frequently found in drinking-water supplies, for reference in preparing a water safety plan.</p> <p>Guideline will give water suppliers flexibility in demonstrating compliance with the requirements of the drinking-water provisions of the Act.</p> <p>Research paper commissioned by MOH to quantify the economic costs of the water contamination.</p>

National Standards	How it relates to Water Supply Activity
Water New Zealand Publications 1. Code of Practice for Fluoridation of Drinking-water Supplies in New Zealand 2. Water Loss Guidelines (2010)	Specifies good practice for the design and operation of water fluoridation plants to ensure fluoride is added safely and effectively to water supplies. Resources & guidance tools necessary to firstly analyse the level of water losses in a network and move forward in reducing the level of water losses to an appropriate reasonable level for the individual supply.

4.3.3 Council Local Bylaws, Polices, Plans, Strategies & Standards

Table 11: Council Bylaws, Polices, Plans, Strategies and Standards documents relating this activity.

Council Documents	How it relates to Water Supply Activity
Tasman District Council District Plan – Tasman Resource Management Plan (TRMP)	A combined regional and district plan with statements of issues, objectives, policies, methods and rules addressing the use of land, water, coastal marine area and discharges into the environment. Part V applies to all uses of water including taking, diverting and damming.
Tasman Regional Policy Statement (TRPS)	An overview of significant resource management issues with general policies and methods to address these. Part 7 Fresh Water Resources outlines the control of land use for the purposes of water management.
Tasman District Council Engineering Standards and Policies 2013	Sets out the standards for the design of engineering works associated with the development of urban supplies, eg, material types, capacity of pipes.
(Proposed) Land Development Manual	Provides standards and guidance for the design and construction of network assets and infrastructure that are or will be owned by Council.
Tasman District Council Financial Strategy	Sets out the how Council funds its activities, projected population growth rates, funding expenditure, projected debt levels and management of investments.
Tasman District Council's Infrastructure Strategy	Identifies infrastructure issues, principal options for managing issues and implications of those options.
Tasman District Council's Procurement Strategy	The procurement strategy dictates the process for all procurement at the Council. The strategy does cater for scale and size of the acquisition.
Water Bylaw 2016	Enable Council to manage the provision of public water supply. Protect the public water supply network from damage, misuse, and interference; and protect the environment and the health and safety of the public and persons using the public water supply.
Long Term Plan	The Local Government Act 2002 requires Council to produce a Long Term Plan (LTP) every three years. The LTP outlines activities and priorities for ten years, providing a long-term focus for decision-making.

Council Documents	How it relates to Water Supply Activity
Water and Sanitary Services Assessments (WSSA) 2005	<p>Evaluated all Council-owned, community and some private water and wastewater services. Two-volume document:</p> <p>Volume 1: An overview of the water and sanitary services in Tasman District with recommendations and priority rankings for future improvements</p> <p>Volume 2: The detailed assessments.</p>
Water Safety Plans (WSP)	Encourage the application of risk management principles to water-treatment and distribution to minimise controllable risks of contamination.

4.4 Strategic Studies

Table 12: Strategic Studies related to this activity

Strategic Studies		Date
Brightwater	Richmond, Wakefield, Waimea and Mapua Water Supply Network Model	2007
	Richmond and Brightwater/Hope Water Demand Management Plan	2010
	Brightwater/Hope Water Demand Management Plan	2018
	Brightwater Water Safety Plan	2011
Collingwood	Water Demand Management Plan for the Tasman District	2011
	Leak detection monitoring	2011
Dovedale	Water Demand Management Plan for the Tasman District	2011
Eighty Eight Valley	Water Demand Management Plan for the Tasman District	2011
Hamama	Limited studies have been undertaken to date for the Hamama water supply system. If the system is retained by Council, then a Water Safety Plan will need to be developed.	
Kaiteriteri/Riwaka	Water Demand Management Plan for the Tasman District	2011
Mapua/Ruby Bay/ Mapua Rise	Richmond, Wakefield, Waimea and Mapua Water Supply Network Model	2007
	Mapua/Ruby Bay Water Demand Management Plan	2018
	Mapua/Ruby Bay and Waimea Industrial Zone Water Safety Plan	2011
	Motueka Coastal Community Water Supply Demand Projection	2011
	Coastal Pipeline and Tasman View Road Upgrade	2011
	Coastal Pipeline – Reservoir Siting Investigation	2010
	Coastal Pipeline – Preliminary Hydraulic Design Report	2010

Strategic Studies		Date
	Programme Business Case – Mapua Water and Wastewater	2017
	Mapua Hydraulic Model	2018
Motueka	Motueka Town Water Supply Coastal Scheme Water Safety Plan	2009
	Water Demand Management Plan for the Tasman District	2011
	Motueka Coastal Community Water Supply Demand Projection	2011
Murchison	Water Demand Management Plan for the Tasman District	2011
Pohara	Water Demand Management Plan for the Tasman District	2011
Redwoods (1& 2)	Water Demand Management Plan for the Tasman District	2011
Richmond	Richmond Water Supply Network Model	2011
	Richmond and Brightwater/Hope Water Demand Management Plan	2010
	Richmond Water Safety Plan	2010
	Water Demand Management Plan for the Tasman District	2011
	Mapua/Ruby Bay and Waimea Industrial Zone Water Safety Plan	2011
	Richmond Water Treatment Plant Design	2011-2015
	Richmond Hydraulic Master Plan (currently being updated 2018)	2018
Tapawera	Water Demand Management Plan for the Tasman District	2011
Upper Takaka	Upper Takaka Water Safety Plan	2011
	Water Demand Management Plan for the Tasman District	2011
Waimea	Waimea 100-Year Water Demand And Supply Modelling	2017
	Evaluation of Options for Waimea Basin Urban Water Supplies in the Event Waimea Community Dam Does Not Proceed	2015
	Assessment of Base Case for Waimea Basin Urban Water Supplies in the Event Waimea Community Dam Does Not Proceed	2015
Wakefield	Wakefield Water Supply Network Model	2007
	Water Safety Plan for the Wakefield Water Supply	2012
	Wakefield Water Demand Management Plan	2018
	Wakefield Hydraulic Model	2017

5 Levels of Service

A key objective of this plan is to match the levels of service provided by this activity with the agreed expectations of our customers and their willingness to pay for that level of service. These levels of service provide the basis for the life cycle management strategies and works programmes identified in this Plan.

Levels of service can be strategic, tactical or operational. They should reflect the current industry standards and be based on:

- Customer Research and Expectations: information gained from stakeholders on expected types and quality of service provided.
- Statutory Requirements: Legislation, regulations, environmental standards and Council bylaws that impact on the way assets are managed (eg, resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service to be provided.
- Strategic and Corporate Goals: Provide guidelines for the scope of current and future services offered and manner of service delivery, and define specific levels of service, which the organisation wishes to achieve.
- Best Practices and Standards: Specify the design and construction requirements to meet the levels of service and needs of stakeholders.

5.1 Our Levels of Service

Table 13 summarises the levels of service and performance measures for this activity. The light blue shaded rows show those that are included in the Long Term Plan and reported in the Annual Plan. Unshaded white rows are technical measures that are only included in the Activity Management Plan.

Table 13: Levels of Service

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2018/19	2019/20	2020/21	2028/29
Our water takes are sustainable.	<p>Compliance with resource consent is achieved, as measured by the number of:</p> <ul style="list-style-type: none"> • abatement notices • infringement notices • enforcement orders • convictions • received in relation to those resource consents. <p>All resource consents are held in NCS/ BraveGen.</p>	<p>Achieved</p> <p>We have achieved compliance with all our resource consent conditions and there have been no notices or orders issued during the past 12 months.</p> <p>(Target: 0)</p>	0	0	0	0
Our water takes are sustainable.	<p>The volume and percentage of real water loss from the network is less than the target.</p> <p>Total real loss= total water provided - water metered - non revenue water. % = L real loss divided by average L usage per connection as yearly average.</p> <p>Mandatory measure 2</p>	<p>Achieved</p> <p>We have achieved a weighted district average of 21% total network water loss.</p> <p>Kaiterireri, Tapawera, Wakefield & Upper Takaka did not achieve the target.</p> <p>(Target: 29%)</p>	≤25%	≤25%	≤25%	≤25%
Our use of the water resource is efficient.	<p>Water loss does not exceed 4.00 as measured by the Infrastructure Leakage Index (ILI).</p>	<p>New Measure</p> <p>In 2016/17 Tasman reported a 3.6 ILI</p>	<4.00	<4.00	<4.00	<4.00
Our water takes are sustainable.	<p>The average urban consumption of drinking water per day per resident is less than the target.</p> <p>Mandatory measure 5</p>	<p>Achieved</p> <p>We achieved a total urban average of 183L per person per day in 2017.</p>	<250L per person/day	<250L per person/day	<250L per person/day	<250L per person/day

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2018/19	2019/20	2020/21	2028/29
Our use of the water resource is efficient.	Water Demand Management Plans are in place for the major urban water schemes and are reviewed every 5 years.	Achieved 9/9 (Target 9/9)	9/9	9/9	9/9	9/9
Our water is safe to drink.	Minimise the number of temporary advisory notices issued to customers to boil water.	Not Achieved There was 1 temporary advisory issued in 2017. (Target 0)	0	0	0	0
Our water is safe to drink.	We comply with Part 4 (bacterial compliance criteria) of the Drinking Water Standards. As measured by the number of schemes with <ul style="list-style-type: none"> • plant compliance, and • zone compliance, as determined by the Drinking Water Assessor. Mandatory measure 1	Not Achieved For the last compliance year (ending June 30, 2017), four treatment plants (Collingwood, Dovedale, Eight-Eight Valley, Hope/Brightwater) did not comply and one distribution zone (Dovedale) did not comply. The reason for plant non-compliance: Collingwood: High turbidity Dovedale: High turbidity and chlorine levels <0.2mg/l Eight-Eight Valley: High turbidity Hope/Brightwater: High turbidity The reason for zone non-compliance: Dovedale: E.coli detected. There is a permanent boil water notice on the Dovedale supply. See table 20 below.	Plant compliance 16/17 Zone compliance 16/17	Plant compliance 16/17 Zone compliance 16/17	Plant compliance 16/17 Zone compliance 16/17	Plant compliance 17/17 Zone compliance 17/17

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2018/19	2019/20	2020/21	2028/29
Our water is safe to drink.	<p>We comply with Part 5 (protozoal compliance criteria) of the Drinking Water Standards.</p> <p>As measured by a number of schemes with compliant protozoa treatment determined by the Drinking Water Assessor.</p> <p>Mandatory measure 1</p>	<p>Not Achieved</p> <p>For the last compliance year (ending June 30, 2017), one (Upper Takaka) of 15 WTPs fully complies.</p> <p>Richmond, Tapawera & Murchison have UV treatment but do not fully comply yet.</p> <p>The capital programme outlines a series of WTP upgrades.</p>	3/15	5/15	7/15	15/15
Our water is safe to drink.	<p>Water Safety Plans are in place, approved & implemented for each water supply.</p> <p>As measured by approval from the Ministry of Health (Drinking Water Assessor).</p>	<p>Not Achieved</p> <p>4/16 schemes have a current plan: Richmond, Motueka, Mapua/Ruby Bay and Brightwater/Hope.</p> <p>(Target: 16/16)</p>	16/16	16/16	16/16	16/16
Our water supply systems provide fire protection to a level that is consistent with the national standard.	<p>95% compliance with FW2 standards, for not less than 5 randomly selected fire hydrants tested annually in urban supplies.</p> <p>*15 hydrants for Richmond.</p>	New measure	95%	95%	95%	95%
Our water supply systems are built, operated and maintained so that failures can be managed and responded to quickly.	<p>Planned service interruptions do not exceed 8 hours as required under section 69S (3) of the Health Act 1956.</p> <p>As measured through the maintenance contract reporting.</p>	<p>New measure</p> <p>(Target <8 hours)</p>	<8 hours	<8 hours	<8 hours	<8 hours

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2018/19	2019/20	2020/21	2028/29
Our water supply activities are managed at a level that the community is satisfied with.	<p>Percentage of customers (who receive a service) are satisfied with the water supply.</p> <p>Measured through the annual residents' survey.</p>	<p>Not Achieved</p> <p>80% of customers (who receive a service) were satisfied or very satisfied (Target: 80%)</p>	≥80%	≥80%	≥80%	≥80%
Our water supply activities are managed at a level that the community is satisfied with.	<p>Complaints per 1000 connections are less than the target - relates to clarity, taste, odour, pressure or flow, continuity of supply and Council response to these issues.</p> <p>Justified complaint defined as a notification of a drop in LOS.</p> <p>Measured Confirm database and NSC system.</p> <p>Mandatory measure 4</p>	<p>Not Achieved</p> <p>43 complaints per 1000 connections (Target: <20)</p>	<20	<20	<20	<20
Our water supply activities are managed at a level that the community is satisfied with.	<p>Median response times are within targets for urgent call-outs (<2 hours).</p> <p>Median response times are within targets for non-urgent call-outs (<48 hours).</p> <p>Mandatory measure 3</p>	<p>Not Achieved</p> <p>The system required to record response times was implemented in 2016/17 and we will be able to report on a full set of data for 2017/18.</p> <p>We expect data for response times for calls received within office hours to be reliable.</p> <p>We expect data for response times for calls received outside of office hours to be less reliable and we plan to refine the data collection process to improve data reliability.</p>	<p><2 hours</p> <p><48 hours</p>	<p><2 hours</p> <p><48 hours</p>	<p><2 hours</p> <p><48 hours</p>	<p><2 hours</p> <p>< 48 hours</p>

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2018/19	2019/20	2020/21	2028/29
Our water supply activities are managed at a level that the community is satisfied with.	<p>Median resolution times are within targets for urgent call-outs (<24 hours).</p> <p>Median resolution times are within targets for non-urgent call-outs (<8 working days).</p> <p>Mandatory measure 3</p>	<p>Not Achieved</p> <p>The system required to record response times was implemented in 2016/17 and we will be able to report on a full set of data for 2017/18.</p> <p>We expect data for resolution times for calls received within office hours to be reliable.</p> <p>We expect data for resolution times for calls received outside of office hours to be less reliable and we plan to refine the data collection process to improve data reliability.</p>	<p><24 hours</p> <p><8 working days</p>	<p><24 hours</p> <p><8 working days</p>	<p><24 hours</p> <p><8 working days</p>	<p><24 hours</p> <p><8 working days</p>
Our water supply systems are designed and operated to be resilient.	<p>Urban water supply networks have sufficient reservoir storage capacity. Defined as one day at average annual demand.</p> <p>As measured through annual demand figures vs. actual storage</p>	<p>Not Achieved</p> <p>Motueka does not have reservoir storage.</p> <p>(Target 12/13)</p>	12/13	12/13	12/13	12/13

5.2 Levels of Service Changes

Council reviews its levels of service every three years, as part of the Long Term Plan development. Table 14 below summaries the key changes Council has made during development of the Long Term Plan 2018 – 2028.

Table 14: Summary of areas where we are changes to our levels of service

LOS Theme	Performance Measure	Summary of change
Sustainability and Efficiency	Water loss	Raising our Levels of Service (LOS) by lowering water loss target from 31% in 2015/16, 29% for 2016/17 and 28% for 2017/18 with a continued decreasing target of 25% in the longer term. Require investment in leak detection and proactive repairs. Adding new technical LOS and performance measure to report on water loss as measured by the Infrastructure Leak Index.
Sustainability	Water consumption	We are raising our LOS by lowering the consumption target. The 2015 target was set at <300L per person per day. We have collected 2 years of data and are comfortably achieving the target in most settlements and as such have decided to lower the target to <250L per person per day.
Efficiency	Water demand management plans	We are raising our LOS performance measure by amending the way we require and report on water demand management plans and including a measure of currency to ensure plans are reviewed every 5 years.

This AMP review has incorporated some recommendations from external agencies, these are summarised in Table 15.

Table 15: External agency recommendations

External Agency	Guidance Support
Department of Internal Affairs	Define the non-financial performance measures rules and provide supporting guidance and examples.
Water New Zealand	Water New Zealand publish the National Performance Review (NPR), an annual benchmarking exercise of New Zealand's 3 Waters service delivery . This is an optional exercise, but Tasman District Council have submitted annual performance data since 2015.
Controller and Auditor General	Controller and Auditor General publishes several documents including: <ul style="list-style-type: none"> Local government: Examples of better practice in setting local authorities' performance measures Matters arising from 2015-25 local authority long-term plans Water and roads: Funding and management challenges

5.3 Levels of Service Performance & Analysis

5.3.1 Compliance with Resource Consent

Figure 2 shows that since the performance measure was introduced in 2014/15, compliance with resource consents is improving. In 2014/15 three separate infringement notices were issued:

- Boil water notice issued in Richmond due to an incident where a bird entered a storage tank;
- Breach at the Waimea Reservoir - cause unknown, suspected unsealed roof;
- Chlorination failure on the Dovedale water scheme.

In 2015/16, one infringement notice was issued when the Brightwater water take exceeded the allowed limit. The performance target will remain at 100% compliance in the future.

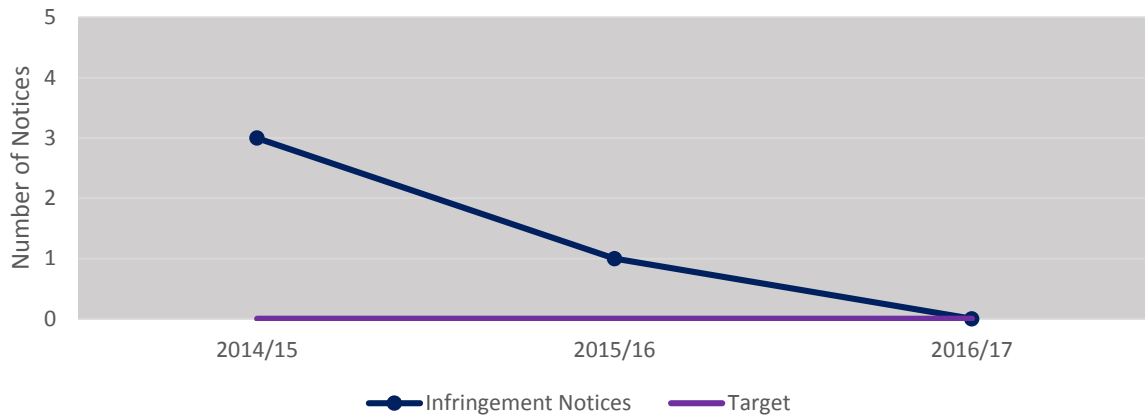


Figure 2: Compliance with resource consents illustrated by the number of notices issued since 2015

5.3.2 Volume and Percentage of Water Loss

Water loss is a critical factor in managing all water supply schemes and is an indicator of network efficiency. At any given time, there will be losses occurring in some part of our network and measurements used simply represent a snapshot in time. There are various tools available to monitor losses. Council use the Benchloss NZ tool to calculate water loss. Identifying changes in water use is an important part of the ongoing network maintenance. Water loss can occur due to a number of factors including:

- Authorised unbilled use (Fire Service, flushing);
- Apparent Losses (meter inaccuracy or theft);
- Real losses (leakage).

There are a number of methods for expressing network water loss, but for simplicity, Council compare the loss as a percentage of water input making an allowance for unbilled consumption and meter inaccuracies. Currently, Council do not report on water loss in the rural networks, as these systems are not metered. Measures are taken to monitor flows and help identify anomalies and any losses. The tools currently used to monitor losses include:

- Changes in daily water production which is graphed and reported on each week;
- Night flow monitoring through our SCADA system by looking at flow into the system during the period from approximately 1am to 5am when normal usage should be at a minimum;

In the 2015 AMP, the water loss target was set at 31% for 2015/16, 29% for 2016/17 and 28% for 2017/18 with a decreasing target of 25% over the 10-year period. In 2016/17, Council reported that several individual schemes (Kaiteriteri, Tapawera, Wakefield and Upper Takaka) did not meet the target; however, the weighted district average was 25% water loss. Council plans to maintain the <25% target from 2018 onwards.

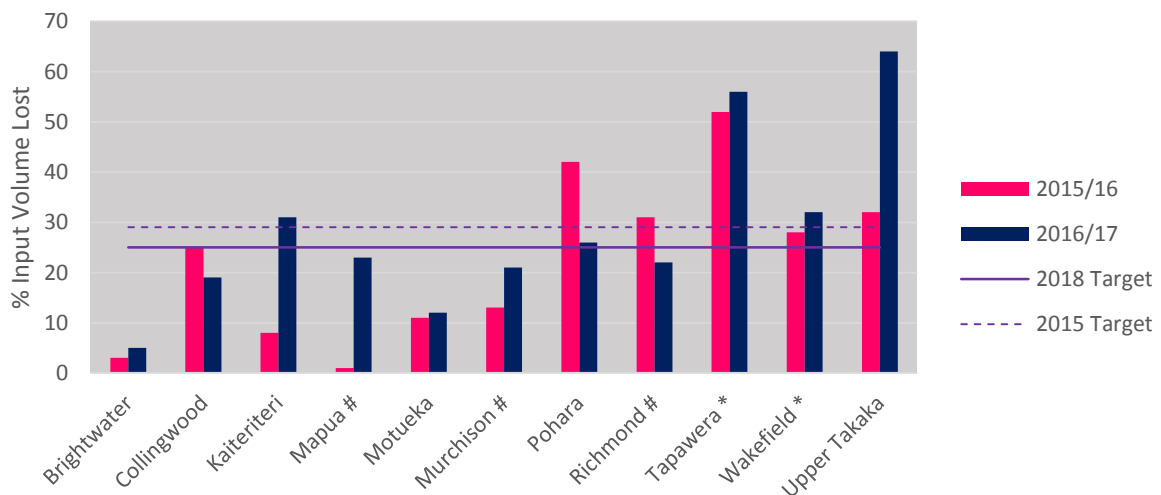


Figure 3: Percentage of input volume water loss for each urban water scheme.

When leaks are suspected in the reticulation, targeted leak detection is conducted to locate the leak. Council take a proactive approach by repairing leaks immediately. The * in Figure 3 indicates that Council undertook leak detection surveys in Tapawera and Wakefield (2015/16) and the # indicates survey conducted in Mapua, Murchison, and Richmond in 2016/17. Council has planned an ongoing budget of \$150,000 per annum for leak detection and day/ night flow monitoring and network modelling to help identify and address the water loss issue. Council intends to continue to target poor performing urban water schemes to reduce water loss.

Water New Zealand publish water loss data in The National Performance Review (NPR). This provides an ongoing performance assessment and serves as a benchmarking exercise to compare water loss against other water supply authorities. Tasman has reported 2 years of water loss data in the NPR, this is expressed as annual real losses (litres/meter/day).

There are many challenges and variables associated with collecting, interpreting and comparing water loss data. Some of these include:

- Meter reading calendar is different to financial/reporting calendar;
- Supply meters are not all read on the same date;
- Meters become less accurate over time;
- Length of pipe reticulation;
- Network pressure;
- Large pipe breaks.

Large bursts in the reticulation can account for significant water volumes lost and reflect in large variations in data year on year. This is suspected to be the case for the water supply scheme in Mapua, where several large bursts have occurred, particularly during 2016/17.

Water loss specialists are encouraging the sector to move away from using percentage water loss, however as percentage water loss is a Department of Internal Affairs mandatory measure, Council is obliged to report on it. Percentage water loss is a performance measure that is easy for customers to understand as it serves the purpose of being a customer focused measure.

5.3.3 Water loss as measured by the Infrastructure Leakage Index (ILI).

As previously discussed, percentage water loss is not an ideal performance measure for network efficiency. For this reason, Council has introduced a new technical performance measure related to the Infrastructure Leakage Index. Council has set the ILI target to <4.

The Infrastructure Leakage Index (ILI) is a preferred key performance indicator and is considered best practice by the European Benchmarking Commission and Water New Zealand. In 2016/17 National Performance Review, Tasman District Council reported a 3.6 ILI; this is considered 'Moderate' water loss.

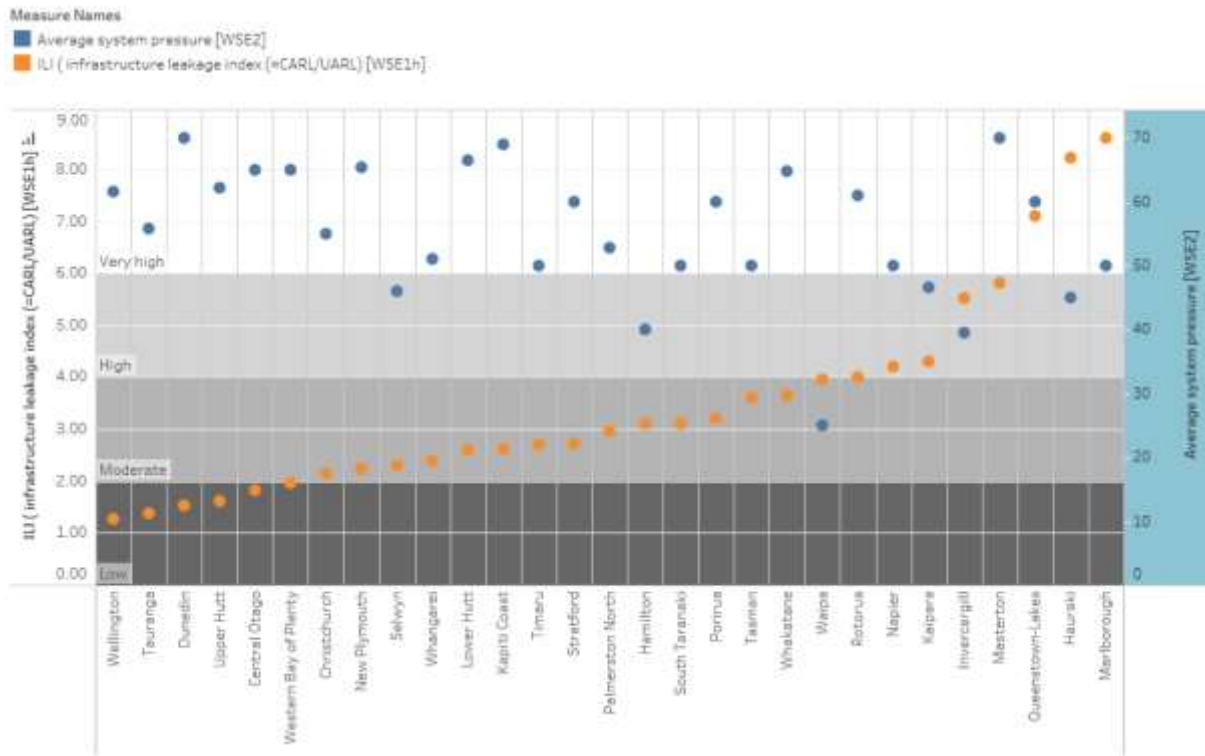


Figure 4: Water loss as measured by Infrastructure Leakage Index (ILI)

5.3.4 Demand Management Measured by Average Urban Consumption

Council collects information to determine whether the water supply system is being managed to ensure demand does not outstrip capacity. This performance measure illustrates the water consumption for individual urban schemes but does not report on rural or small community schemes.

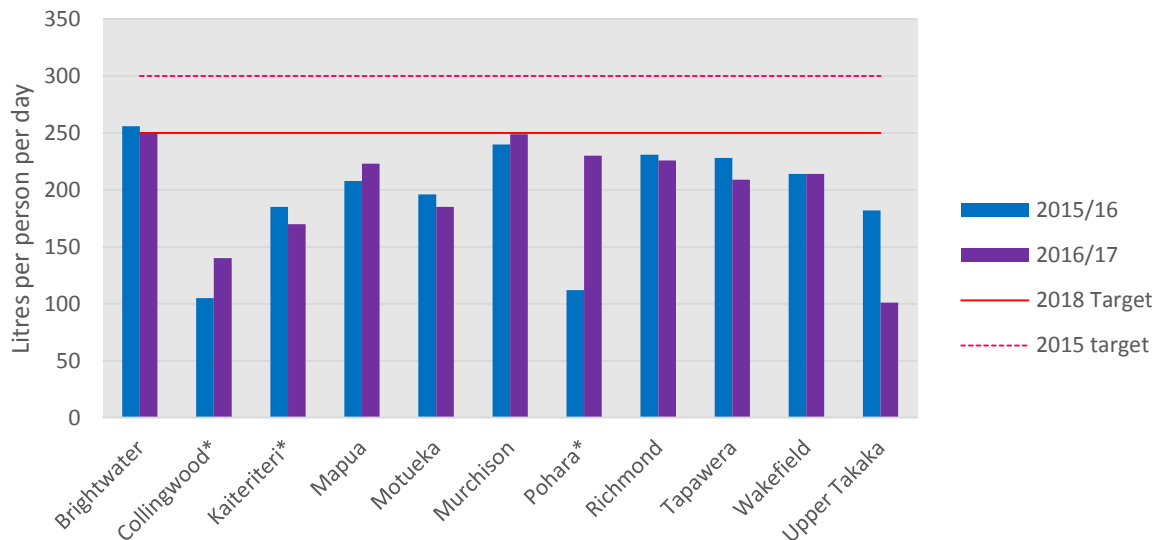


Figure 5: Average water consumption for each urban water supply schemes:

There is only two years of data available on this performance measure, so it is difficult to establish an overall consumption trend. Currently, some settlements are increasing, and some are decreasing. Decreasing demand may be due to a combination of several factors including household appliance and fittings efficiencies, water conservation publicity, sustainable development techniques, and water-saving behavior.

There are seasonal changes in water use. Water use in summer is higher than in winter because of increased water use in gardens. Demand for water tends to be highest between December and March. There are seasonal variations in settlement such as Kaiteriteri, Pohara and Collingwood that experience an influx of visitor’s particularly in the summer months. The * in Figure 5 above indicates settlements with low occupancy rates and high numbers of holiday homes.

This performance measure was introduced in the in the 2015 AMP and the initial target was set at <300L per person per day. Council is comfortably achieving the target in most settlements and have determined to lower the target to <250L per person per day accordingly.

Council expects that the Brightwater and Murchison may not meet the new performance target given their current performance.

5.3.5 Water Demand Management Plans

Demand management is a long-term commitment to more efficient water use and is about sustainably reducing the amount of water used. Water Demand Management Plans (WDMP) set out a roadmap for future water demand management in specific schemes or areas. Wider area WDMPs have been completed for the District and the Waimea Plains. More specific plans are in place for all the major urban supplies, including:

Table 16: Summary of Water Demand Management Plans

Supply Scheme/Area	WDMP in Place	Last Updated	Update Due
Richmond	☑	2017	2022
Brightwater/Hope	☑	2010	2015*
Wakefield	☑	2010	2015*
Mapua/Ruby Bay	☑	2011	2016*
Riwaka /Kaiteriteri	☑	2013	2018
Collingwood	☑	2015	2020
Murchison	☑	2015	2020
Motueka	☑	2017	2022
Tapawera	☑	2016	2021
District Wide	☑	2013	2018
*	WDMP update is required		

At the time this AMP was being finalised (June 2018), Water Demand Management Plans were in draft format and being reviewed for the following schemes: Brightwater/Hope, Mapua and Wakefield.

The remaining schemes either have a lower demand where they are considered too small or are categorized as a rural scheme and as such, a WDMP is not required. To compensate for not having a WDMP for such schemes, basic checks are undertaken, comparing water sold through water meters with what was pumped. This helps determine the quantity of water leakage and then leak detection testing is carried out when major leakage is suspected.

In the 2015 AMP, this performance measure simply indicated whether a plan was in place for each water supply scheme and the results appeared to convey a sense of poor achievement with only 9/15 schemes complying. Because WDMPs are not required for small or rural schemes, Council have amended the performance target to 9 schemes (major urban supplies) and have changed the wording to include the WDMP currency to ensure they are reviewed every 5 years. WDMPs are currently being produced for the following schemes: Brightwater/Hope, Mapua/Ruby Bay, and Wakefield.

5.3.6 Temporary Advisories (Boil Water Notices)

A performance measure related to the number of temporary advisories gives an indication about the safety record of this performance measure. There is a permanent boil water notice in place at Dovedale, which is not covered in the targets as it is always in place. Historically, few temporary advisories have been issued in relation to our water supplies. One temporary boil water notice was issued in Brightwater in April 2017. This was due to heavy rain causing the Wairoa River to rise and become dirty with high sediment loads. This affected the groundwater quality in the supply bores. In 2015/2016 there were no temporary advisories issued. In 2014/2015, a boil water notice was issued in relation to an incident where a bird entered the Richmond Water Treatment Plant storage tank.

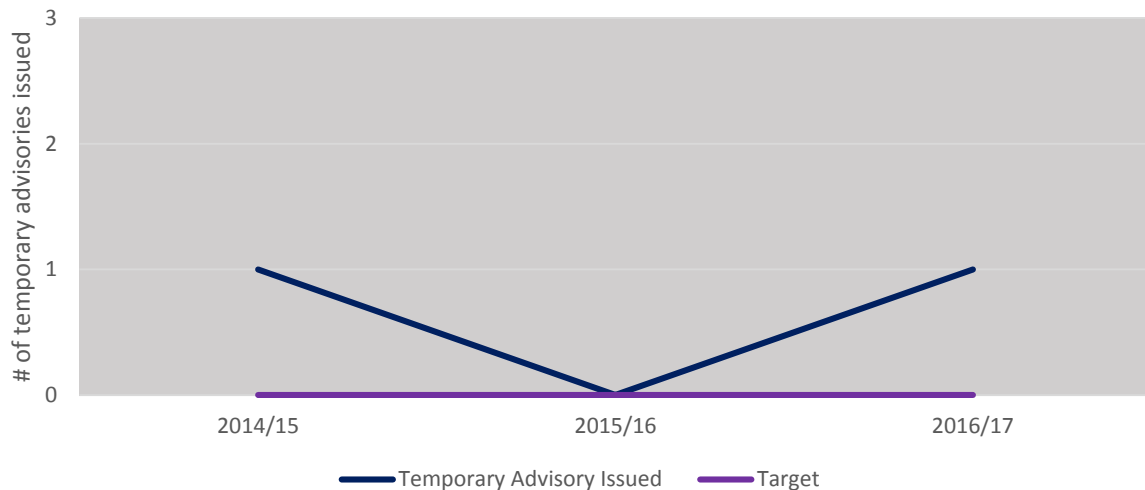


Figure 6: Number of temporary advisories issued per year

Non-chlorinated water supplies have a higher risk of contamination in the reticulation than chlorinated supplies. Council plans for non-chlorinated supplies to have an emergency chlorination treatment option added during the upgrades of the WTPs. Richmond WTP has had emergency chlorination in place since 2015. Kaiteriteri WTP will be completed in 2018 and Motueka in 2020.

The Havelock North Inquiry identified the need for planning improvements around boil water notices. It found that better planning and preparedness of boil water notices will save time when notifying residents of the need to boil water. Council staff will be reviewing the existing planning mechanisms and intend to improve our processes and document these in an emergency operation file.

Council is planning to keep the performance target at zero.

5.3.7 Compliance with Part 4 of the DWSNZ

The Department of Internal Affairs requires Council to collect data and report on compliance with Part 4 of the DWSNZ. Part 4 specifically relates to water contamination by bacteria. This performance measure provides consumers with information on whether their water supply is safe to drink. It can also help Council and communities make informed decisions on whether to upgrade existing WTPs or build new WTPs.

Council have recently changed the way it carries out and reports on water sampling to match the Ministry of Health's (MoH) annual drinking-water survey as requested by Audit NZ.

Water samples are taken at treatment plants and within the distribution zone and reported on by each scheme separately. E.coli samples are part of this testing regime. From January 2018, all water samples have been processed as Most Probable Number counts (MPN) for total coliforms and E.coli. Prior to this, only a Presence /Absence (P/A) test was done. The P/A test would only tell you if bacteria was present, not the number. The MPN test provide a count.

The results are extracted from the National Water Information New Zealand (WINZ) database (administered by the MoH) and are presented in the table below. **From July 2017, results have been stored in the Online MoH database 'Drinking Water Online' that replaced the WINZ system.**

Table 20 below shows compliance results for the year ending June 30, 2017. Four of 17 treatment plants (Collingwood, Dovedale, Eight-Eight Valley, Hope/Brightwater) did not comply. The reason for plant non-compliance:

- Collingwood: High turbidity
- Dovedale: High turbidity and chlorine levels <0.2mg/l
- Eight-Eight Valley: High turbidity
- Hope/Brightwater: High turbidity

One distribution zone (Dovedale) did not comply. The reason for zone non-compliance:

- Dovedale: E.coli detected. There is a permanent boil water notice on the Dovedale supply.

Table 17: Results of 2016/17 bacterial compliance (Part 4 DWSNZ) for water supply schemes

Bacterial Compliance	Plant Compliance			Zone Compliance	
	Bacterial Sampling Complied?	Water Quality Compliance ¹	Reason for Non-Compliance	Bacterial Compliance in Zone?	Reason for Non-Compliance
Collingwood	Yes	No	NTU	Yes	Complied
Dovedale Rural	Yes	No	NTU, Chlor	No	T, PBWN
Eighty Eight Valley Rural	Yes	No	NTU	Yes	Complied
Hope/Brightwater	Yes	No	NTU	Yes	Complied
Kaiteriteri	Yes	N/A	Complied	Yes	Complied
Motueka	Yes	N/A	Complied	Yes	Complied
Murchison	Yes	Yes	Complied	Yes	Complied
Pohara	Yes	N/A	Complied	Yes	Complied
Redwood Valley 1	Yes	Yes	Complied	Yes	Complied
Redwood Valley 2	Yes	Yes	Complied	Yes	Complied
Richmond	Yes	N/A	Complied	Yes	Complied
Waimea Industrial*	N/A	N/A	-	Yes	Complied
Tapawera	Yes	Yes	Complied	Yes	Complied
Mapua Ruby Bay	Yes	Yes	Complied	Yes	Complied
Wakefield	Yes	Yes	Complied	Yes	Complied
Upper Takaka	No	N/A	T	Yes	Complied
Mapua Rise	Yes	N/A	Complied	Yes	Complied

Table Key

T – Transgression: E.coli detected

IS – Insufficient sampling (technical non-compliance)

NT – No protozoa treatment in place yet

TF – Treatment failure

Tech – Technical non-compliance (e.g. data collection failure due to server outage)

PBWN- Permanent Boil Water notice

NTU - High turbidity

Chlor - chlorine level (<0.2mg/l)

NA – Compliance criteria 1 from Part 4 of the NZDWS applies. All other plants use compliance criteria 2.

1 physical water quality parameters: pH, turbidity and free available chlorine (FAC)

* Waimea Industrial is a zone only and has no separate plant. It is supplied from the Richmond treatment plant.

Table 18 below has a different format to the 2016/17 bacterial compliance results.

Table 18: Results of 2017 bacterial compliance (Part 4 DWSNZ) and protozoa compliance (Part 5 DWSNZ) for water supply schemes

Distribution Zone	Bacterial Compliance?	Reason for Non Compliance (Bacterial)	Protozoal Compliance	Reasons for Non Compliance
Collingwood	Yes	Complied	No	NT
Dovedale Rural	No	T, PBWN	No	NT
Eighty Eight Valley Rural	Yes	Complied	No	NT
Hope/Brightwater	Yes	Complied	No	NT
Kaiteriteri	Yes	Complied	No	NT
Motueka	Yes	Complied	No	NT
Murchison	Yes	Complied	No	Tech, TF
Pohara	Yes	Complied	No	NT
Redwood Valley 1	Yes	Complied	No	NT
Redwood Valley 2	Yes	Complied	No	NT
Richmond	No	T	No	Tech
Waimea Industrial	Yes	Complied	No	Tech
Tapawera	Yes	Complied	No	Tech, TF
Mapua Ruby Bay	Yes	Complied	No	NT
Wakefield	Yes	Complied	No	NT
Upper Takaka	Yes	Complied	No	Tech
Mapua Rise	Yes	Complied	Yes	Complied

Key

NT – No protozoa treatment in place yet

NA – Not applicable

TF – Treatment Failure

Tech – Technical noncompliance (e.g. data collection failure due to server outage)

5.3.8 Compliance with Part 5 of the Drinking Water Standards

Currently only one (Upper Takaka) of our 15 water treatment plants fully comply with the Drinking Water Standards. Compliance status is an annual snapshot that is measures from July to June.

Mapua Rise is a new plant that was vested to council in April 2017. The part of the year that it was operated achieved compliance. Murchison, Tapawera and Richmond also have protozoa treatment; however, monitoring procedures are not yet comprehensive enough to classify these as fully compliant.

Council plans to invest planned \$21 million in new and upgraded WTP between 2018-2025. Priority has been given to the highest risk schemes. The recommendations from the Havelock North Inquiry suggests that the affordability clause about 'all practicable steps' will be removed from the Health Act 1956.

Table 19: 2016/2017 Results Part 5 NZ Drinking Water Standards

Plant	Protozoal Compliance	Reasons for Compliance (Protozoal)
Collingwood	No	NT
Dovedale Rural	No	NT
Eighty Eight Valley Rural	No	NT
Hope/Brightwater	No	NT
Kaiteriteri	No	NT
Motueka	No	NT
Murchison*	No*	Tech, TF
Pohara	No	NT
Redwood Valley 1	No	NT
Redwood Valley 2	No	NT
Richmond**	No**	Tech
Tapawera*	No*	Tech, TF
Mapua Ruby Bay	No	NT
Wakefield	No	NT
Upper Takaka***	No***	Tech
Mapua Rise	Yes	Complied

Table Key

NT – No protozoa treatment in place yet

NA – Not applicable

TF – Treatment failure

TECH – Technical non-compliance (e.g. data collection failure due to serves outage)

*Both Murchison and Tapawera only have one UV unit. Technical issues with both of these units caused outages for part of the year.

**As Richmond is a large supply, it requires 'continuous monitoring'. Technical issues with capturing and storing all of the data needed to prove compliance have mean that full compliance was not attempted. Regardless, the water was treated for protozoa 100% of the time.

*** Upper Takaka requires an approved Water Safety Management Plan to be in place to achieve full compliance. This ran out in the 2016/2017 compliance year and so full compliance was not achieved

5.3.9 Water Safety Plans

This performance measure related to Water Safety Plans (WSPs) indicates that Council ensures practicable steps are taken to ensure public safety. The World Health Organization (WHO) defines water safety plans as the 'use of a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer', and promotes them as 'the most effective means of consistently ensuring the safety of a drinking-water supply'.

Councils WSPs are reviewed by a drinking-water assessor and endorsed on behalf of the Ministry of Health and the Nelson-Marlborough District Health Board. These plans provide the benefit of reducing the likelihood and consequence of contaminants entering into water supplies and specifically outlines how Council intend to meet the requirements of the Health Act. Table 20 below list illustrates the status of WSPs that a required for supply schemes.

Table 20: Summary of water safety plans including status and expiry date

Supply Scheme/Area	Water Safety Plan Status			Last Updated	Update Due
	In place	Expired	Approved		
Brightwater/Hope	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	2017	2022
Collingwood	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	2012	2017
Dovedale	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Eighty-Eight Valley	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Kaiteriteri/Riwaka	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		2017	2022
Mapua/Ruby Bay	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	2017	2022
Mapua Rise	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Motueka	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2017	2022
Murchison	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2017	2022
Pohara	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		2018?
Redwood Valley 1	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		2018?
Redwood Valley 2	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		2018?
Richmond	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	2016	2021
Tapawera	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2011	2017
Wakefield	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2012	2017
Upper Takaka	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2011	2016

Figure 7 below shows slightly declining performance in WSP approval over the last three years. In 2015, there were nine out of 15 plan approved. In 2016 the number of approved plans dropped to five. Three plans had expired that year. In 2017, the number of expired water safety plans increased to four and there were three approved. Note there is a slight change in performance target because the Mapua Rise scheme was vested to Council in 2016/17.

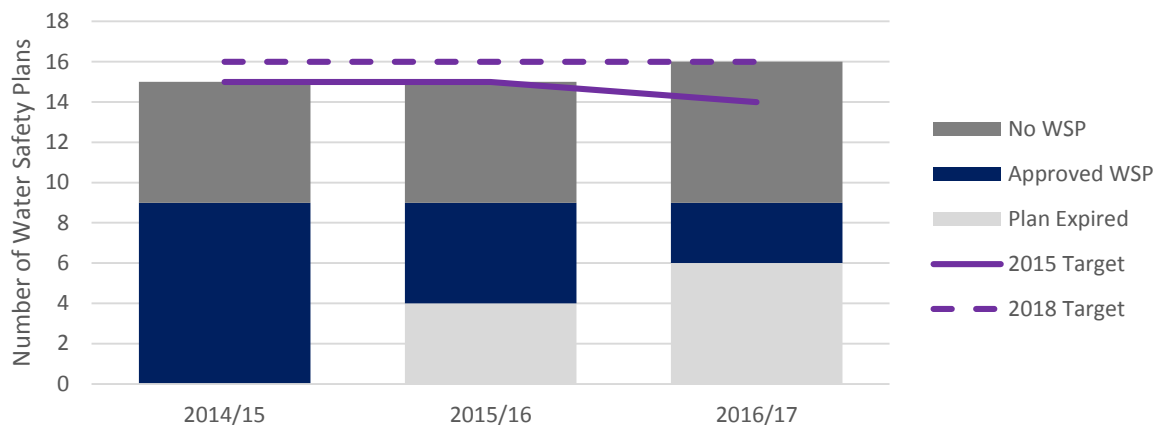


Figure 7: Status of Water Safety Plans

5.3.10 Compliance with Fire Fighting Pressure

Council has adopted a new approach to measuring the firefighting service levels. The new approach was presented by the Auditor General as better practice has simplified the way Council measures service levels. Previously in 2015, there were two level of service measures related to firefighting.

The new performance measure is applicable to urban supplies only. Rural and community water supplies do not currently provide sufficient firefighting capability therefore are not covered by this measure. Takaka has a reticulated firefighting scheme in the town centre and Motueka has a network of fire wells which provided a limited service.

New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ 4509:2008) outlines water requirements including flow rate and pressure for firefighting purposes and recommends appropriately located pressured connections and water volume from fire hydrants which are regulated and in the building standard. As a minimum firefighting supplies need to comply with the code. Firefighting infrastructure such as hydrants need to be maintained and tested to ensure suitability and compliance.

5.3.11 Planned Service Interruptions

Council have adopted this performance measure as a customer focused level of service. The performance target reflects the (8 hours) timeframe guidelines that are recommended in section 69S (3) of the Health Act 1956.

Council has instructed the operations and maintenance contractor to maintain records on all planned service interruptions.

5.3.12 Customer Satisfaction

The public has high expectations that water supply supplies will operate continuously and adequately.

Council undertake regular surveys to get feedback on a range aspects related to water supply. Information in the survey results inform Council use when considering performance measures targets and determining when improvements or new infrastructure is required.

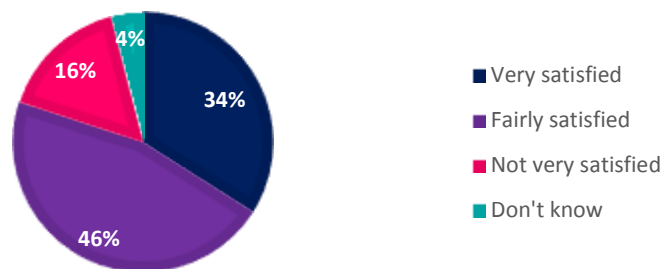


Figure 8: Customer satisfaction (service provided)

Figure 8 shows the breakdown of satisfaction results from the 2017 **Communitrak™ Survey**. It is important to note that this data represents satisfaction of customers that receive a water supply service. 80% were satisfied or very satisfied. 16% of residents **were not very satisfied and 4% didn't know**. There is a range of reasons why some residents are not satisfied with the water supply, these are grouped into broad categories and include:

- Cost issues/too expensive/paying for water we don't use;
- inadequate/limited supply/need more dams;
- poor quality of water/substandard.

Council has 10 years of customer satisfaction data that provides good comparative information about how the water supply service is perceived. Figure 9 shows percentage of customers satisfied with the service. Satisfaction levels peaked in 2009/2010 appear to be declining.

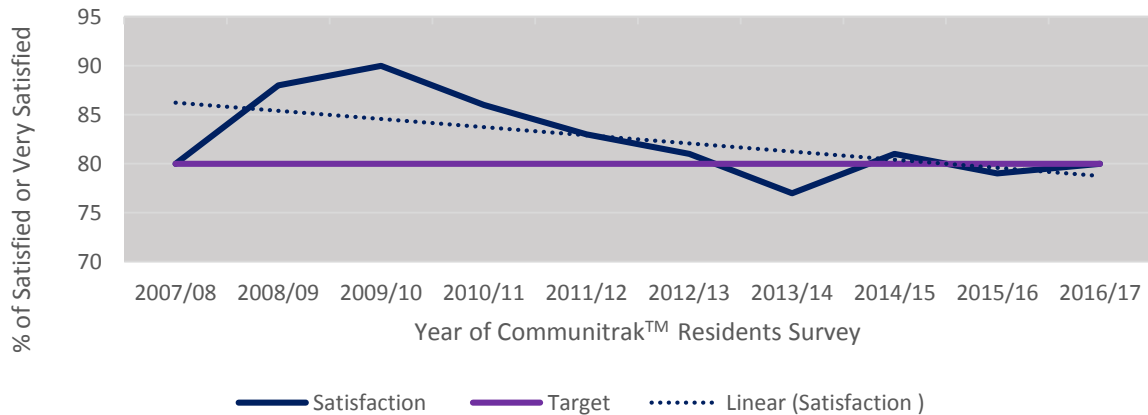


Figure 9: Customer satisfaction trends with Water Supply over time

5.3.13 Customer Satisfaction and Complaints

The Department of Internal Affairs also requires Council to report information related to customer satisfaction and complaints about the following:

- Drinking-water clarity;
- Drinking-water taste;
- Drinking-water odour;
- Drinking-water pressure or flow;
- Continuity of supply;
- Response to any of the above issues.

This mandatory measure provides information on complaints and how satisfied customers are with the way in which Council respond to requests to fix problems. Council need to consider whether customers are satisfied with the adequacy and reliability of the water supply service. Where there is more than one complaint per event, each complaint is counted separately, not each event or occurrence. The benefit of this approach means the measure **records the public's response** to the event.

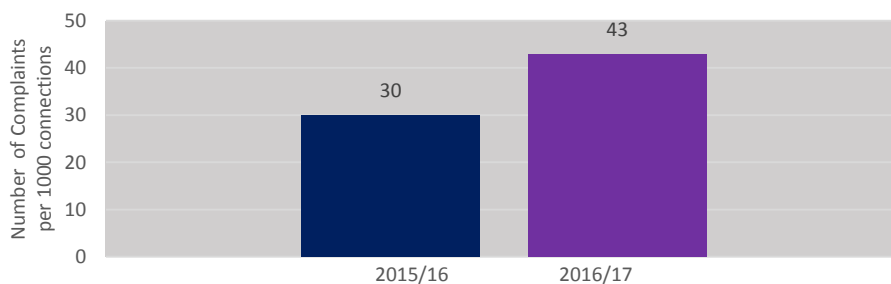


Figure 10: Number of annual complaints

Since the measure was introduced 2015, Council have only collected data over two years, making it is difficult to confidently infer any trends or patterns. Complaints appear to be increasing. In both 2016 and 2017, most of the complaints are related to the Dovedale and 88 Valley schemes (rural water supplies with higher levels of sediment) where the restrictor has been blocked.

For the purpose of this measure, a complaint is defined as a drop in level of service experienced by the customer. The system and process to systematically extract data is not possible and as a result it is currently a subjective and inconsistent process that needs improvement. Council staff are exploring an alternative approach to improve address this.

5.3.14 Response and Resolution Times

Response and resolution timeframes are a Department of Internal Affairs mandatory measure. Historically, capturing these timeframes has been problematic to report because a system to accurately capture relevant and data did not exist.

A system to record response and resolution times was implemented in 2016/17 and we will be able to report on a full set of data for 2017/18. We expect data for response times for calls received within office hours to be reliable. We expect data for response times for calls received outside of office hours to be less reliable and we plan to refine the data collection process to improve data reliability.

To assist data improvements, Council staff are providing a monthly feedback reports to the maintenance contractor to highlight any missing or incomplete information, so they can address data entry issues. Furthermore, staff are also developing a new interface for Call Care (out of hours customer service) so that call centre staff can enter enquiries directly into the asset management system (Confirm) and assign the correct start time.

5.3.15 Water Storage

Storage reservoirs provide water supply in times of network outages or for firefighting purposes. Currently, there are no storage reservoirs in the Motueka supply scheme. There is a backup generator at the scheme source that is located by the Motueka Recreation Centre. This generator can power one of the two bores in a power outage. Additionally, there is alternative supply bore site located on Fearon Street and this backup supply also has a generator.

6 Our Customers and Stakeholders

Council consults with the public to gain an understanding of customer expectations and preferences. This enables Council to **provide a level of service that better meets the community's needs**.

6.1 Stakeholders

There are many individuals and organisations that have an **interest in the management and/or operation of the Council's assets**. Council has a Community Engagement Policy which is designed to guide the expectations with the relationship between Council and the Tasman community. Council has made a promise to seek out opportunities to ensure the communities and people it represents and provides services to, have the opportunity to:

- be fully informed;
- provide reasonable time for those participating to come to a view;
- listen to what they have to say with an open mind;
- acknowledge what we have been told;
- inform contributors how their input influenced the decision Council made or is contemplating.

Engagement or consultation:

- is about providing more than information or meeting a legal requirement;
- aids decision making;
- is about reaching a common understanding of issues;
- is about the quality of contact not the amount;
- is an opportunity for a fully informed community to contribute to decision-making.

The key stakeholders Council consults with about the water supply activity are:

- elected members (Community Board members);
- **iwi (Council's Treat Partners)**;
- Regulatory (Consent compliance, Public Health);
- Fisheries organisations;
- Heritage New Zealand;
- Civil Contractors Federation (Nelson - Marlborough);
- service providers / suppliers (Network Tasman, Power Companies);
- affected or interested parties (when applying for resource consents);
- neighbours;
- Ministry of Health;
- Local District Health Boards;
- Local Drinking Water Assessors.

6.2 Consultation

6.2.1 Purpose of Consultation and Types of Consultation

Council consults with the public to gain an understanding of customer expectations and preferences. This enables Council to **provide a level of service that better meets the community's needs**.

Council's **knowledge of customer expectations and preferences** is based on:

- feedback from residents surveys;
- other customer/user surveys, such as Yardstick visitor measures;
- levels of service consultation on specific issues;
- feedback from staff customer contact;
- ongoing staff liaison with community organisations, user groups and individuals;
- public meetings;
- feedback from elected members, advisory groups and working parties;

- analysis of customer service requests and complaints;
- consultation via the Annual Plan and Long Term Plan processes;

Council commissions residents surveys on a regular basis (the National Research Bureau Ltd has provided this service since 2008). These NRB Communitrak™ surveys assess the levels of satisfaction with key services, including provision of community facilities, and the willingness across the community to pay to improve services. Other informal consultation is undertaken with community and stakeholder groups on an issue by issue basis, as required.

6.2.2 Consultation Outcomes

The most recent NRB Communitrak™ survey was undertaken in May 2017. This asked whether residents were satisfied (when they received a water supply service) and whether they were satisfied overall. The results from this survey are summarised below:

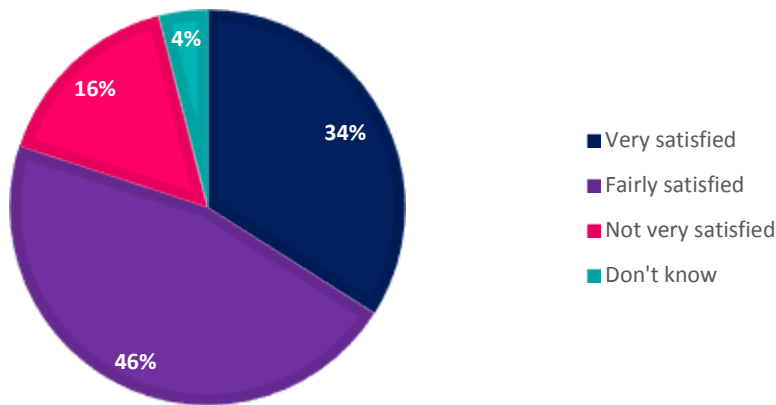


Figure 11: Satisfaction where water supply service is provided

There is a range of reasons why some residents are not satisfied with the water supply, these are grouped into broad categories and include:

- Cost issues/too expensive/paying for water we don't use;
- inadequate/limited supply/need more dams;
- poor quality of water/substandard.

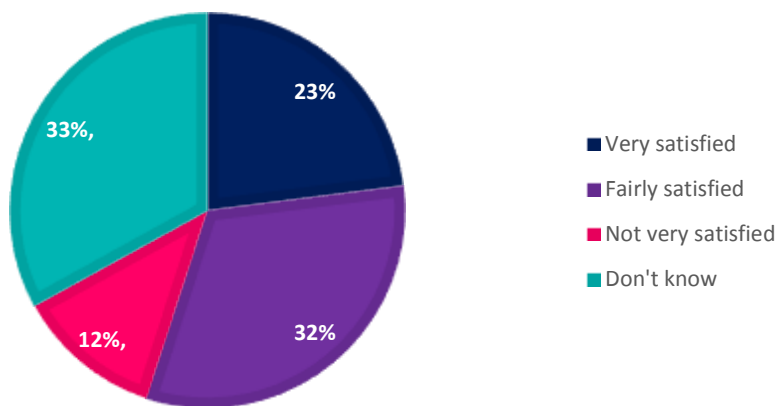


Figure 12: Overall Satisfaction

Figure 12 shows that overall 55% of customers are either satisfied or fairly satisfied with the Water Supply Service. In comparison, we track slightly below our peer group (rural) average of 58%. Furthermore, a large percent (33%) of customers were unable to comment on their satisfaction with the Council's water supply. This is likely to be due to the fact that many residents interviewed said they were not provided with a Council water supply.

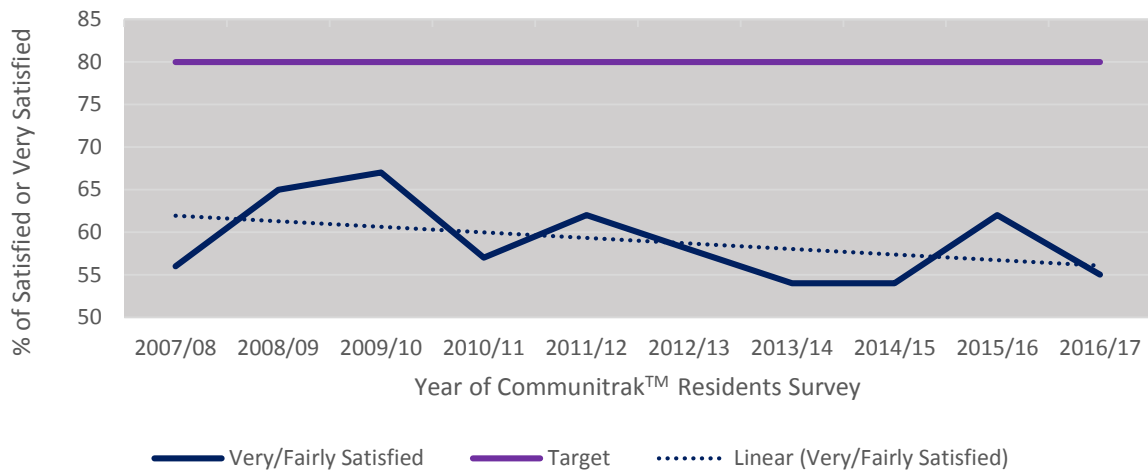


Figure 13: Trends of customer satisfaction over time

Figure 13 shows a slight downward trend in the numbers of people that are either ‘very’ or ‘fairly’ satisfied. It is important to note that this illustrates satisfaction overall (not satisfaction when a service is provided).

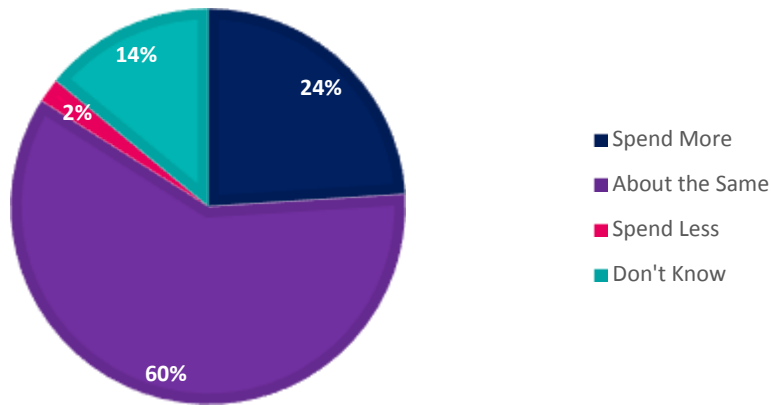


Figure 14: Spending comparison

When asked whether customers would like more to be spent, or less or about the same on water supply given that Council cannot spend more without increasing rates or user charges, most said they would like to see about the same or more as illustrated in Figure 14.

7 Current and Future Demand

The ability to predict future demand for services enables Council to plan ahead and identify the best way of meeting that demand. That may be through a combination of demand management and investing in improvements. This section provides an overview of key drivers of demand and what demand management measures Council has planned to implement.

Water demand forecasting involves predicting how much drinking water will be required in the future and identifying where it will be needed. A reliable forecast can help to ensure that there are enough supplies for domestic, commercial and industrial use, while allowing for future growth and development. It can also contribute to a more efficient use of ratepayers funds, because the infrastructure is the right size to meet the need, including an appropriate level of surplus capacity (OAG, 2010). Historically, Council have demonstrated a proactive approach to demand management as recognised in an 2010 OAG performance audit report where Tasman were considered to be effectively managing demand.

7.1 Demand Drivers

The future demand for water supply will change over time in response to a wide range of influences, including:

- Residential use
- Irrigation for horticultural/agricultural use
- Industrial/Commercial Use
- Tourism
- Climate change/weather patterns
- Social & Behavioural Factors/Environmental Awareness
- Reticulation network characteristics & efficiency
- Councils Controls/Regulation Tools
- Implications of technological change

7.1.1 Residential Use

There is an increasing demand for water in some urban settlements due to population growth. Rural schemes are fully allocated and any new developments in these areas must be self-serviced. Council has not planned to upgrade the rural networks to meet demand due to high costs.

Population growth is assessed through Councils growth modelling. The purpose of the growth model is to provide predictive information (demand and supply) for future physical development, to inform the programming of a range of services, such as network infrastructure and facilities, and district plan reviews. The model generates residential and business projections for 17 settlement areas and 5 ward remainder areas.

The key demographic assumptions affecting future growth are:

- Ongoing population growth over the next 30 years with the rate of growth slowing over time. The overall population of Tasman is expected to increase by 4,420 residents between 2018 and 2028, to reach 55,690.
- Higher growth in Richmond, Motueka, Mapua, Brightwater, and Wakefield for 2018-2028. For 2018-2028, Council has used Statistics New Zealand's high growth projections for Richmond, Brightwater, Wakefield, Motueka, and Mapua/Ruby Bay, and medium growth projections for the rest of the District. Medium growth projections have been used for the whole District for 2028-2048.
- An ageing population, with population increases in residents aged 65 years and over. The median age of the Tasman District population is projected to increase from 44 years in 2013 to 54 years by 2043. The proportion of the population aged 65 years and over is expected to increase from 18% in 2013 to 37% by 2043.
- A decline in average household size, mainly due to the ageing population with an increasing number of people at older ages who are more likely to live in one or two person households.

The following provides a summary of the outputs from the growth model that have been determined by using the above input assumptions and parameters.

- Residential growth is measured in the number of new dwellings. Council has estimated demand for 2,955 new dwellings over the next ten years, and a further 3,040 dwellings between 2028 and 2048. This is based on population and household size projections, and also allow for demand for dwellings for non-residents, such as holiday houses or temporary worker accommodation. The growth model projects demand for new dwellings to be an average of 365 a year for Years 1-3 (2018-2021), dropping to 266 a year for 2021-2028. In recent years, Tasman has experienced increased growth in the number of new dwellings, with an average annual increase in the last three years of 365 new dwellings. The average over the last ten years was 291 new dwellings a year.
- Business growth is measured in the number of new business lots. Council has estimated demand for 243 new business lots in our settlements over the next ten years, and a further 212 new lots between 2028 and 2048. This is based on a business land forecasting model from Property Economics using medium population projections, national and regional economic trends, employment projections and employment to land ratios.

7.1.2 Irrigation for Horticulture/Agricultural Use

Tasman’s location, climate and soils mean it is one of New Zealand’s major horticulture areas. Traditional horticulture sectors in Tasman include fruit (berries, pears apples, and pip fruit) and market garden vegetable operations. Tasman is New Zealand’s main commercial hop growing area and there is growth in the viticulture sector. Most horticultural operations are highly reliant on irrigation. Generally, large-scale irrigators abstract their water from private bores and this activity puts pressure on the limited water resources in rivers and aquifers. Water resources are already over-allocated in Waimea Basin.

7.1.3 Industrial/Commercial Use

The District is growing and with it comes an increasing demand for water from industrial and commercial users. Generally, the industry type and process use will determine the amount of the water these users will consume. Table 21 summaries the existing industrial and commercial water users in the region:

Table 21: Industrial and Commercial Users

Large Industrial Users	Large Commercial Users
Nelson Pine Industries (manufacturer)	Retirement homes
ENZA (food manufacturer & cool stores)	Schools (swimming pools)
Alliance (meat processor)	Richmond Aquatic Centre (swimming pool)
AICA (chemical manufacturer)	Cool stores (refrigerated warehousing)
Fonterra (dairy cooperative)	Seafood, fruit and food processing plants

Although the industrial/commercial sector is small in proportion to the other users, it is growing and particularly in aquaculture and food processing sectors.

Large industrial users are billed on a volumetric rate and their pricing structures provide incentive to use water efficiently. Council have approached industrial water users to discuss conservation and some have responded. Nelson Pine is the largest water user. Water efficiency improvements and re-use measures are described on Nelson Pines website that illustrate their approach to water savings.

7.1.4 Tourism

Tasman is a popular tourist destination and tourist numbers are increasing. There is an increased seasonal demand for water due to an influx of visitors. Settlements including Pohara, Kaiteriteri and Mapua already experience significant increases in demand because of the number of baches, camping grounds and holiday homes that are used during the summer months. There is also an influx of seasonal workers in the District to support the horticulture sectors. These seasonal visitors increase demand, though to what extent Council is uncertain.

7.1.5 Climatic Influences and Weather Patterns

The anticipated effects from climate change in Tasman District include:

- An increase in seasonal mean temperature and high temperature extremes
- A significant increase in rainfall in winter for the entire district and varying increases of rainfall in other seasons in different areas.
- Rising sea levels, increased wave height and storm surges.
- Floods, landslides, droughts and storm surges are likely to become more frequent and intense

Climatic factors including rainfall, temperature and evaporation will affect water supply and demand. The detailed implications of climate change are not clear, but will increase the uncertainty in security of supply and the variability of weather patterns.

Climate change will have longer-term implications for water supply (in terms of magnitude and timing) will change and river discharge will be altered and effect water availability.

Increases in evaporation have implications for water resources: the amount of freshwater available for abstraction diminishes (in rivers and aquifers) and the amount of water that needs to be abstracted to irrigate a given area of land or to produce a given crop yield increases. Higher rates of evaporation also contribute to more frequent, more intense, or longer droughts.

7.1.6 Social and Behavioural Factors/Environmental Awareness

There is a growing awareness that water resources may not be as abundant as previously perceived. Access to consumer information about products that use water is improving and education campaigns are common place. Consumers are also becoming more aware of water efficiency methods and technology such as rainwater harvesting, grey water and stormwater reuse and they are starting to be used in the District. These changes in attitudes and behaviours are likely to have a gradual effect on water demand and could help to reduce average water consumption.

Best practices guidelines for water reduction and efficiency are being developed and implemented by Central Government and industry sectors. An example of this is the New Zealand Water Efficiency Labelling Scheme that was introduced to provide information to consumers buying products that use water. The labelling provides clear information on water efficiency and consumption in a standardised form. Similarly, commercial and industrial organisation are becoming more aware of water efficiency and taking measures to reduce consumption and promoting their initiatives publically.

7.1.7 Reticulation Network Characteristics and Efficiency

Non-revenue water (NRW) accounts for a significant portion of water demand. NRW includes unbilled authorised consumption (fire-flows, hydrants etc.), apparent losses (meter inaccuracies and unauthorised consumption) and real losses (leakage). Real losses though leakage could be improved to reduce wastage and lower demand. Council expects unbilled authorized consumption to be fairly static.

7.1.8 Councils Controls/Regulation Tools

Council has several tools that influence demand, these include metering and pricing, consent conditions, restrictions, and public conservation education programmes. Council monitors and manages the District's water resource and when conditions are dry, Council considers restrictions. Water rationing, and restrictions can be placed on both domestic users and users drawing water as part of a resource consent. Rating and restriction can lower demand in summer months. Council introduced water metering for all of its urban water supplies in the early nineties. A move to universal metering means user pays for the volume consumed. A secondary benefit is that water consumption decreases. Council can also provide public conservation and education programmes aimed at reducing water consumption, these programmes are often done during restrictions.

7.2 Assessing Demand

7.2.1 Current Demand

There are various methods for assessing current demand, the primary methods used to assess and analyse demand include:

- Bulk water abstraction and production - abstraction volumes are derived from borefield flow meters) and production flow is derived from meters at WTPs. Data is compared against abstraction limits and analysed to determine peak demand in context to possible water restrictions.
- Customer consumption data - based on the six-monthly billing records for customer meters and the monthly billing records for the large industrial customers. This is compared with other Tasman schemes and water usage per capita is calculated and compared against targets.
- Non-revenue water and leakage- an assessment using the standard water balance method estimates network leakage to determine an Infrastructure Leakage Index (ILI). Calculations are conducted to estimate unbilled revenue loss, treatment and energy cost.

7.2.2 Future Demand

To identify the future water demands, it is important that the current demands are accurately identified so that they can be used as a baseline for the future projections. Council uses the following to determine future demand:

- Council's Growth Supply Demand Model
- Population growth (Statistic New Zealand)
- Household dwelling growth derived from building consents numbers
- Research into growth expectation in industrial and commercial sectors
- Research into growth expectations in the rural
- Modelling that enables Council to examine the potential effect of strategies on future demand.

7.3 Demand Management

The objective of demand management (sometimes called non-asset solutions) is to actively seek to modify customer demands for services in order to:

- optimise utilisation/performance of existing assets;
- reduce or defer the need for new assets;
- **meet Council's strategic objectives;**
- deliver a more sustainable service; and
- respond to customer needs.

Demand management also includes both asset and non-asset strategies to manage demand across the water supply activity. Examples of asset strategies include response times, renewals programmes, codes of practice, technical standards, use of approved standards materials and quality assurance measures. Non-asset strategies include education materials/campaigns, promotion of new technologies and efficiencies, leak detection and property inspection.

Prudent management includes managing water demand by best using the water that is already available. Water demand management involves the adoption of policies to control consumer demand or investment to achieve efficient water use by all members of the community.

7.3.1 Council's Approach to Demand Management

7.3.1.1 Water Demand Management Plans

The objective of a Water Demand Management Plan (WDMP) is to provide a framework and action plan to continuously improve water efficiency to achieve a level of water demand management that is consistent with good performance in New Zealand.

In 2013, an overarching Water Demand Management Plan (WDMP) was developed for the District. WDMP have been developed for major urban schemes including: Brightwater/Hope, Collingwood, Kaiteriteri/Riwaka, Mapua/Ruby Bay, Motueka, Murchison, Richmond, Tapawera and Wakefield.

Council engaged Stantec to assist with the preparation of the WDMPs. Over time, the plans have improved in quality and the analysis of data is more detailed. Each plan:

- Identifies scheme issues and historical demand;
- provides water demand analysis of bulk water supply, metered consumption and an assessment of water loss;
- identifies where to target leak detection and repair to address water losses;
- benchmarks bulk water usage with other comparable suppliers from National Performance Review;
- summarises previous and current demand measures; and provides potential future demand measures.

Figure 15 below shows how Council compares in water efficiency with other suppliers in New Zealand as measured by the average daily residential water use. This data was provided from the National Performance Review 2016/17, an annual publication from Water New Zealand.

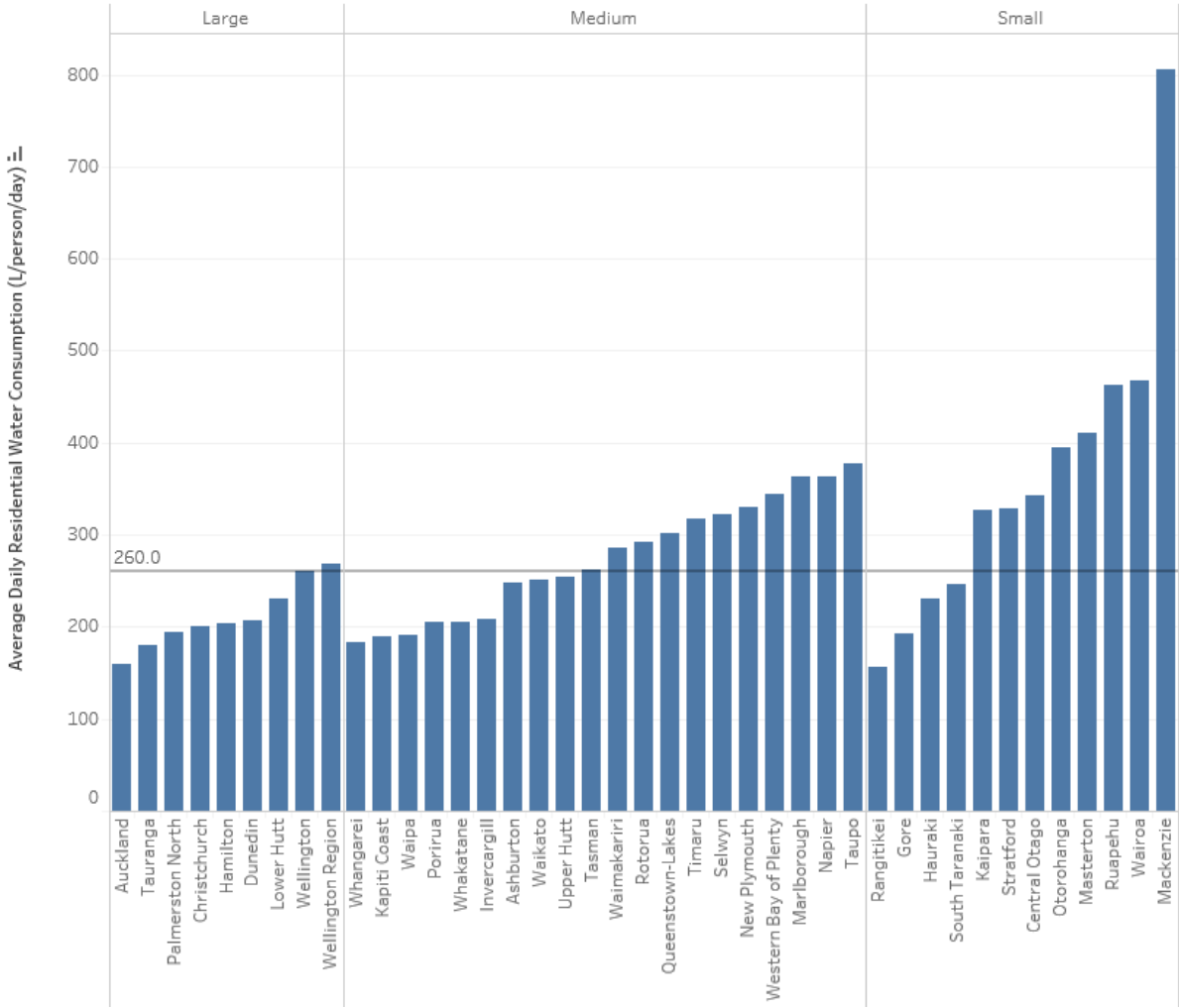


Figure 15: Residential water consumption (L/person/day)

7.3.1.2 Other Demand Management Measures

Council have a wide range of demand management measures in place throughout the District. Water demand management options can be categorised into two key areas: measures and instruments. Measures describe ‘what to do’ to achieve a reduction in water-use (e.g. conversion of inefficient showers to efficient star rated showerheads). Instruments describe ‘how to do it’ (how to ensure that the chosen measures are put into place or taken up). Table 22 below provides a summary of existing demand management measures and potential or future measures that could be considered for adoption. These measures and instruments were largely collated from the more recent WDMPs with a few additions:

Table 22: Current Water Demand Management Measures Used in Schemes

Demand Management Measures & Instruments	Currently Used	Potential to be used in the Future
Measures Infrastructure Management		
Active leakage control programme	✓	
Reactive leakage repair	✓	
Bulk metering of rural-restricted areas to improve understanding of demands		✓
Bulk metering on parts of the rural schemes fitted with advanced technologies connected to a low power wide area network to transmit data		✓
Bulk metering of reservoir outlets to improve night flow monitoring.	✓	
Customer meter testing and replacement programme	✓	
Investigating new sources of water (bores and dam)	✓	
Ongoing capital upgrades and renewals programme	✓	
Building new drinking water supply infrastructure	✓	
Asset renewal planning programme to prioritise infrastructure replacement	✓	
Network Efficiencies		
Water modelling to improve system performance and leakage	✓	
Pressure management	✓	
Measures - Community Engagement		
Passive education programme with information on Council website	✓	
Community education programmes		✓
Educational resources and programmes for schools		✓
Targeted education programmes for specific users (rural properties & top commercial users)		✓
Advice for residential water efficiency methods		✓
Provision of shower timers for people to limit their shower time		✓
Green gardener – water efficient landscaping workshops and free advice		✓
Water advisory service and audits for water users (rural and commercial users)		✓
Instruments - Regulatory Control		
Restricted connections (trickle feed) to rural properties	✓	

Demand Management Measures & Instruments	Currently Used	Potential to be used in the Future
Water restrictions during peak summer periods including developing water restriction protocols to guide Council decision making and provide to customers with information	✓	
Active enforcement of water restrictions during peak summer periods		✓
Proposing district plan changes or resource consents to require mandatory water efficient fixtures in new construction (mandatory dual-flush toilets in all new toilet installations, grey water, rainwater tanks etc.)		✓
Requirement for large customers to prepare demand management plans		✓
Water Bylaw 2016		✓
Preparing a general water conservation policy or demand management policy		✓
Introduce Time Of Use Tariffs to target high water users to reduce demand on the system		✓
Mix of Measures and Instruments - Water Efficient Technologies		
Rebate or subsidy or grant programme for retrofit of water efficient fixtures (can be targeted at residential properties, schools, commercial properties etc. and at specific fixtures e.g. showerheads or dual flush toilets)		✓
Retrofit of water-efficient technologies into Council properties		✓
Rebate or subsidy programme for automatic timers for residential irrigation systems		✓
Mandatory rain/soil moisture sensors for properties with high garden watering.		✓
Assessing non potable sources of supply (grey water)		✓
Metering, Pricing and Other Financial Initiatives		
Metering & charging (volumetric pricing) for urban supplies	✓	
Increasing volumetric charges for metered customers		✓
Increasing seasonal volumetric charges for metered customers (like Carterton District Council)		✓
Measures - Water Capture, Reuse and Recycling		
Rainwater tank rebate or subsidy programme.		✓
Grey water recycling rebate or subsidy programme.		✓

8 Lifecycle Management

Lifecycle cost is the total cost to Council of an asset throughout its life including, creation, operations and maintenance, renewal, and disposal. Council aims to manage its assets in a way that optimises the balance of these costs. This section summarises how Council plans to manage each part of the lifecycle for this activity.

8.1 Asset Condition and Performance

Council needs to understand the condition of its assets as this helps inform asset management decision making. Condition monitoring programmes consider how critical an asset is, how quickly it is likely to deteriorate, and the cost of data collection.

Where condition rating is done, a 1-5 scale is used, as per the NZQQA Infrastructure Asset Grading Guidelines, as shown in Table 23 below.

Table 23: Asset condition rating table

Condition Grade and Meaning	General Meaning
1 Very Good	<p>Life: 10+ years.</p> <p>Physical: Fit for purpose. Robust and modern design.</p> <p>Access: Easy; easy lift manhole lids, clear access roads.</p> <p>Security: Sound structure with modern locks.</p> <p>Exposure: Fully protected from elements or providing full protection.</p>
2 Good	<p>Life: Review in 5 – 10 years.</p> <p>Physical: Fit for purpose. Early signs of corrosion/wear. Robust, but not latest design.</p> <p>Access: Awkward; heavy/corroded lids, overgrown with vegetation.</p> <p>Security: Sound structure with locks.</p> <p>Exposure: Adequate protection from elements or providing adequate protection.</p>
3 Moderate	<p>Life: Review in 5 years.</p> <p>Physical: Potentially impaired by corrosion/wear, old design or poor implementation.</p> <p>Access: Difficult: requires special tools or more than one person.</p> <p>Secure: Locked but structure not secure, or secure structure with no locks.</p> <p>Exposure: Showing signs of wear that could lead to exposure.</p>
4 Poor	<p>Life: Almost at failure, needs immediate expert review.</p> <p>Physical: Heavy corrosion impairing use. Obvious signs of potential failure.</p> <p>Access: Restricted, potentially dangerous.</p> <p>Secure: Locks and/or structure easily breached.</p> <p>Exposure: Exposure to elements evident e.g. leaks, over heating.</p>
5 Very Poor	<p>Life: 0 years – broken.</p> <p>Physical: Obvious impairments to use. Heavy wear/corrosion. Outdated/flawed design/build.</p> <p>Access: Severely limited or dangerous.</p> <p>Security: No locks or easily breached.</p> <p>Exposure: Exposed to elements when not specifically designed to be.</p>

Above ground assets including pump stations and water treatment plants that can be accessed or inspected without the need for digging. Below ground assets include pipelines, and underground valves (excluding air valves on pressure pipelines).

The condition of below ground assets is not well known and there is no formal process for gathering this data. Current practice is to assign water assets a default grade of 3 unless the asset is less than 5 years old. Assets less than 5 years old have been assigned a grade of 1. As new condition information is made available the gradings are amended.

A key objective of the Three-Waters Operation and Maintenance Contract commencing 1 July 2018, is improving asset condition data. The contractor will:

- undertake condition assessments of all above ground assets to confirm or otherwise determine their appropriate condition grading every two years.
- manage and maintain all new assets (less than six months old) and all assets with a condition grading of 1 or 2 to at least condition grade 2 or better.
- manage all other existing assets to at least condition grade 3 or better.

In the event of an asset failure, the contractor will assess the mode of failure and condition of the remaining asset (unaffected by the failure) and condition grading will be amended accordingly.

Council will also undertake random audits of the condition data provided by the contractor.

Pipe condition rating cannot easily be done as the assets are buried and cannot be examined by CCTV without risk of contamination. Breakage reports are used as an indication of poor condition (number of breaks per 100m of pipe). This can be cross-referenced with known pressures in the system to see if the area has a mismatch between actual pressure and the rating of the pipes.

The following sections provide a high-level overview about the condition and performance of the water supply networks. **Further details about specific assets is captured in Confirm and ActiveManuals™**

Brightwater

Assets in the Brightwater scheme are generally in good condition.

Some of the assets in the treatment plant have been recently upgraded and the bore heads were upgraded in 2010. The telemetry was also upgraded to digital in the last few years.

A new reservoir was constructed and commissioned in 2009 to address the lack of storage.

The high lift pump set up is probably the oldest item at the treatment plant, but is not known to be causing any on-going problems. An inline meter near the bores, on the inlet to the treatment plant (connected to telemetry) would be a useful tool for measuring flow (instantaneous and daily) and may be required to comply with new metering standards in the next few years.

Most pipe repairs are on old polyethylene (PE) and AC pipes (rider mains and service laterals). Many of the original PE rider mains have been renewed through the process of breakage and repair.

Collingwood

Since the water supply for Collingwood has only recently (2003) been commissioned the assets are in good condition.

Dovedale

The Dovedale scheme was not designed to be a domestic supply, its original purpose was to be an agricultural scheme. The majority of the reticulation in the Dovedale scheme is unreliable. There have been continual problems with Polyvinyl chloride (PVC) pipe joints and splitting of polythene pipes since the scheme was constructed. The main reason for polythene failure is degradation of the material which becomes brittle with time. Some of the larger diameter pipes were constructed in AC and there have also been problems with these pipes. Pipe failures relate to low quality material that were installed cheaply.

Eighty-Eight Valley

The scheme assets are in mixed condition. The intake and pipe have been subjected to storm damage on several occasions and are repaired as necessary. Many of the pipes have little cover and are subject to damage from being too shallow. The pipe near the treatment plant in Wantwood is visible in several places. There are no known ongoing issues with leakage, although as most of the pipes are through private rural land, leaks may go unnoticed for a long time.

Kaiteriteri/Riwaka

The condition of most of the pipework in the system is good. There are no known specific condition concerns for the assets. Most of the infrastructure is of an age where condition problems are not expected and inspections by Council staff, maintenance contractors and consultants have not identified any specific problems except an upgrade required to the pumping station surrounds. The two wooden reservoirs that provide storage for the scheme present some problems and one has been relined. These assets have a shorter life than concrete reservoirs.

Mapua Rise

The equipment and reticulation on the Mapua Rise scheme are brand new and were vested to Council in 2016/17. They are in a very good condition. Issues related to this scheme are related to water quality rather than asset condition.

Mapua/Ruby Bay

The reticulation is mostly in average condition but there are large areas of poor quality, fragile pipeline in Mapua.

A section of trunk main from the treatment plant to the Pomona Road reservoir has burst a number of times since its construction. The first kilometre section of this main has been replaced. Other risk areas are Aranui Road, Stafford Drive, Pomona Road, Rabbit Island and Best Island Road. There is a significant pipe renewal programme planned for address these areas.

Motueka

The majority of pipeline in the Motueka supply is considered to be in moderate condition. There are some areas in poor condition that suffer from frequent mains failures. Some of the reticulation is Class B uPVC and is approximately 25 years old. There have been several problems relating to pipe breakages which are believed to be caused by low grade (Class B) pipe and the high surge pressures. This can arise when water is pumped into a closed system with no break pressure such as a tank or reservoir. The Class B pipe is a limiting factor within the system. Areas suffering regular problems include High Street South, Fearon Street, Old Wharf Road, Thorp Street and central High Street.

There are issues with the water quality at the Fearon's Bush supply which started in October 2010. From this supply was suspended and tests were continued to monitor the bacteria levels. The levels have continued to fluctuate and have not reached acceptable levels therefore it is unlikely it will be reconnected to the system without the development of a treatment plant. This plant is only used in emergencies and will be decommissioned when the new WTP in Parker Street is completed and operational.

Murchison

The assets are generally in good condition and the reservoirs are in good structural condition.

The majority of the reticulation is AC and PE for the smaller rider mains with typical problems for those material types. Repairs are managed through the operations budget until the major renewal programme commences.

Repairs following a leak detection survey in April 2008 succeeded in reducing daily water demand and many rider mains have been replaced since 2010. More recent leak detection surveys were conducted in 2016/17 and this programme will continue as necessary.

An existing bore and a well were replaced with 2 new bores in July 2011.

Pohara

The condition of the pipework in the system is variable. Some pipework was installed during subdivision construction in the 1990s but a large part of the system is older and of poorer quality. There are not many breaks reported.

After the 2011 flood, damaged pipes were replaced and improved the average system condition.

Redwood Valley 1 & 2

Some of the reticulation in the Redwood Valley (1&2) scheme is unreliable.

Redwoods 1 Reservoir is in poor condition and is leaking. Repairs were undertaken in 2010 to reduce this leakage. The reservoir is planned to be replaced by 2019/20 with twin 30,000L plastic tanks either on the existing site or on an adjacent property, as there is access issues.

The associated booster pump station will be renewed due to its poor condition.

Most of the assets are of an age where condition problems are occasionally expected. As breaks occur pipelines are repaired, and short sections replaced. Some of the pipelines in the poorest condition have been renewed or upgraded. This reticulation renewals programme is ongoing.

Richmond

The condition of most of the pipework in the system ranges from a good to moderate condition. There are sections of pipe which are cause problems and many of the copper laterals and old AC pipes are coming to the end of their life.

There have been many breaks in AC mains over the last few years, and as such recent AC pipe renewals have been completed in Fauchelle, Darcy, Florence, Herbert and Elizabeth Street.

Some other old mains and rider mains require renewal. Most pipe repairs are on old PE pipes (rider mains and service laterals) and larger AC pipes from the 1960s. Many of the original PE rider mains have been renewed through the process of breakage and repair. Cast iron mains also require replacement. Cambridge and Wensley were completed in 2016/17.

The previous Waimea scheme assets are generally in good condition. The condition of most of the reticulation is good, however the pH of the water was low and considered 'aggressive'. The construction of the new Richmond WTP was completed in 2015 and the strategic approach and design blends both the Waimea and Richmond water sources and treatment to address the aggressive pH issue. Specifically, the mixing of water sources dilutes the high nitrate levels in the Richmond source and reduce the corrosiveness of the Waimea source.

To improve security of the supply the well heads were protected from stock access in 2012 and later upgrades. An electrical upgrade and a digital telemetry upgrade were completed in 2010. Due to a power spike at the treatment plant in 2010 (which severely damaged electrical equipment) all of the water quality monitoring equipment and some of the pump variable speed drives (VSDs) were replaced in the second half of 2010.

Takaka

A new FW2 standard firefighting reticulation was installed in Takaka CBD in 2011. It consists of 2 bores and pumps with an emergency generator.

Tapawera

The majority of the reticulation is AC and PE for the smaller rider mains with problems typical to those material pipes and may be a source of the high water loss reported. Some PE rider mains have been replaced as part of the renewals programme and copper laterals were replaced as part of the meter renewals programme.

Leak detection and repairs (2016/17) have resulted in improved daily water consumption volumes, however private water leaks have been known to cause daily usage for the township to double.

The bore head works, reservoir power supply and telemetry system were upgraded in the 2006-2008 period.

UV was installed in 2013 for protozoa treatment to meet the DWSNZ and a new contact tank and lime dosing shed was installed in 2016/17.

Upper Takaka

The majority of the reticulation is of poor quality. Most of the reticulation system is galvanised iron pipe and is reported to be in poor condition.

Wakefield

The scheme assets are in moderate condition.

High leakage and unaccounted water have been ongoing issues. The majority of the reticulation is AC and PE for the smaller rider mains making them unreliable with problems typical to those material pipes. Frequent repairing and replacement of copper and PE rider mains prone to leakage and breaks has helped reduce the issue. Many of the original PE rider mains have been renewed through the process of breakage and repair.

Initial leak detection was carried out in 2014, and a large leak (137 m³/day) was identified and repaired. Several line meters now exist to better identify leaks. Further leak detection was carried out in the 2016/17 period and repairs were made.

Due to the proposed construction of a new treatment plant at Spring Grove, for which budget is allocated in years 2018/19, no recent improvements have been made to the well head and none are proposed. If the Wakefield supply is inundated by flood waters resulting in contamination of the water supply beyond the current treatment capabilities, or the electrical controls fail the community can be served from the Brightwater/Hope Scheme through the link and pump station at Bird Road.

8.2 Operations and Maintenance

8.2.1 Key Maintenance and Operational Themes

Age, Condition and Performance

Generally, age, condition and performance data in conjunction with operator and staff knowledge of assets is used to make decisions about how the water supply activity is operated and maintained. Sometime this data is lacking, and Council has determined that improvements to data, processes and systems is required to enhance our ability to manage the network.

Havelock North Inquiry

Council anticipates that the outcomes and recommendations from the Havelock North Water Inquiry will change the way Council operate the water supply schemes. Likely changes may include technical amendments to legislation, managing risk, catchment protection, water safety plans, and drinking-water standards. Although details of the changes are not yet clear, Council are making some minor operational changes to the way Council sample and monitor (in addition to the planned capital works WTP programme). It is likely that more minor operational changes may occur as advice comes from the Ministry of Health.

Rural Reticulation

The costs to operate and maintain the rural supplies is increasing. Some sections of the reticulation are in poor condition due the pipe materials used and installation techniques. In some cases (e.g. Kelling Road), it costs less to renew rather than maintain. In this case, Council will prematurely renew the pipes instead of continuing to repair defect pipes.

Water Loss

There is an ongoing leak detection programme to identify sources of water loss. Repairs are made when a leak is found, and Information collated from the detection surveys helps to inform the renewals programme.

8.2.2 Maintenance Contract

The operation and maintenance of the water supply systems has been incorporated into a performance-based contract. The current maintenance contract was awarded to Downer New Zealand Ltd in 2007 and extended in 2013. Council extended it again through to mid 2018 to allow for the procurement of a new contract.

The key outcomes of the new contract include:

- A high degree of reliability of all services, systems, network and supply.
- Best value to the ratepayer.
- Consistently meeting regulatory requirements – no breaches of resource consents.
- High levels of customer satisfaction.
- Assets sustainably maintained to meet asset condition ratings.
- Innovations introduced that add value.
- Accurate and timely reporting to meet statutory requirements and contract targets.
- Up-to-date and accurate asset information.

8.2.3 Maintenance Strategies

Routine and Reactive Programme

There are different types of maintenance strategies and approaches for the water supply activity. The two major maintenance programme categories include routine and reactive work. Typically, reactive work includes responding to day-to-day asset failures. Examples of this type of work include pipeline breaks, valve and meter replacements etc. Generally, routine work is more proactive and include activities such as:

Table 24: Summary of routine maintenance activities

Maintenance activity	Description
Rural storage	Council conduct pro-active maintenance activities by flushing rural reservoirs and break pressure tanks twice yearly, first in early summer and then in late autumn. The purpose is to remove sediment and unwanted debris particles that can cause blockages.
Reticulation flushing	Council maintain a water reticulation flushing programme to remove sediment and inappropriate material from the network. Low-level rural areas in Dovedale and Eighty-Eight Valley are flushed and dead-end mains in the urban areas are regularly flushed to remove stale water.
Rural restrictor checks	Every 2 years rural restrictors have a maintenance inspection to check flow, clear, and flush blockages if required.
Shut valve checks	Every 6 months shut valves are checked to ensure good working order. Once a year, large valves (100ml+) are exercised to ensure they can open and shut correctly.

Maintenance activity	Description
Surface intake inspections	Annual inspections are conducted on all schemes with surface water intakes including: Eighty-Eight Valley, Upper Takaka, Pohara and Dovedale.

8.2.4 Forecast Operations and Maintenance Expenditure

30-year forecasts for operations and maintenance costs are shown in Figure 16 below. The most notable increases occur between Year 1 and Year 4, during which time the operating costs increase due to the inclusion of the Waimea Community Dam. Council has budgeted for the Dam to be operational by Year 4. For detailed breakdown forecast operations and maintenance expenditure, see Appendix A.

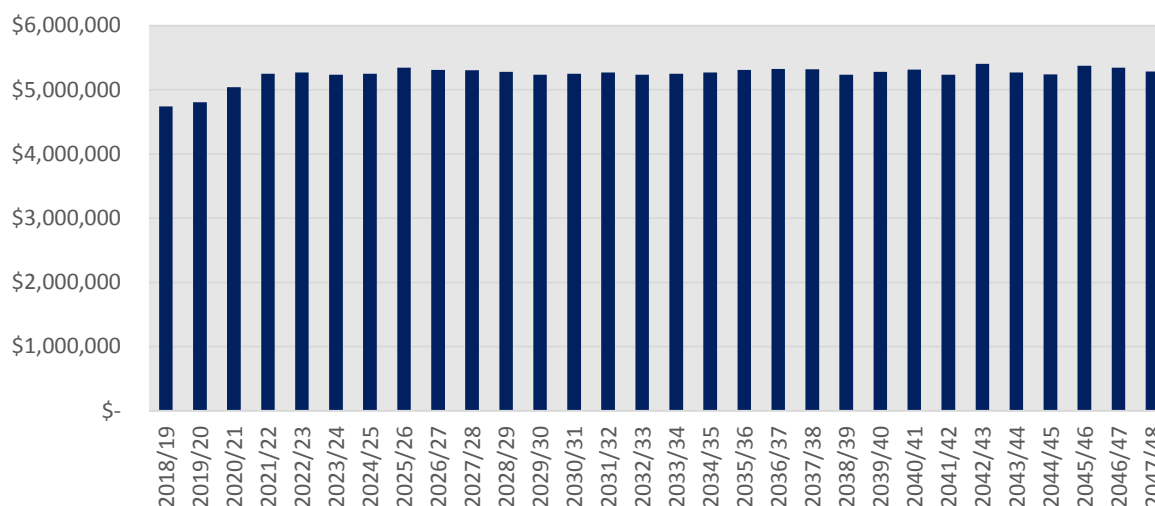


Figure 16: 2018 – 2048 Direct Operations and Maintenance Expenditure Excluding Inflation

8.3 Asset Renewal/Replacement

Renewal expenditure is major work that does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Funding of work over and above restoring an asset to its original capacity is considered to be new capital works expenditure.

8.3.1 Key Renewal Themes

Water Loss

Information and data gathered during leak detection surveys and their associated repairs helps collate knowledge about the condition and performance of some assets. In turn, this information will help to inform the prioritisation of the renewals programme.

Annual Budgets

Annual budgets are planned in advance and sometimes unexpected failures occur where the asset needs immediate renewal. In some cases, it can be more cost effective to wait until an asset complete fails rather than renew on its birthday (e.g. some pumps are about \$5k to buy but cost \$50k to run over a 10-year period).

8.3.2 Renewal Strategies

Assets are considered for renewal when:

- they near the end of their effective useful life;
- the cost of maintenance becomes uneconomical and the whole-of-life costs are less to renew the asset than keep up maintenance;
- the risk of failure of critical assets is unacceptable.

The renewal programme has generally been developed by the following:

- Taking asset age and remaining life predictions, calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs.
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and asset management staff. This incorporates the knowledge gained from tracking asset failures and performance through the asset management system.
- The renewal programme is reviewed in detail every three years, by planning advisors, asset engineers and engineering management; and cross-referenced with other activities to determine if other projects are occurring in the same location. Timings may be tweaked to optimise overall programme to minimise disruptions to the public and realise potential costs saving in the reinstatement and preliminary and general works where possible.
- Every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.
- Staff have been developing a tool (Pipe Break Viewer) that spatially displays the location and frequency of pipe maintenance data with an emphasis on pipe breaks. The purpose of the tool is to assist staff in making better-informed decisions about the reticulation renewals programme.

8.3.3 Delivery of Renewals

Minor renewal projects are typically carried out by the operations and maintenance contractor. Contracts for larger value renewal projects are tendered in accordance with the Procurement Strategy. Prior to the asset being renewed, the operations and maintenance contractor will inspect these assets to confirm whether renewal is actually necessary. In the event it does not need to be renewed, a recommended date of renewal is then entered back into the Confirm database. This new date will then be included in the next AMP update.

The identification of water pipeline renewals in the rural areas is refined to achieve the most suitable renewals programme for the available budget. This refinement is primarily based on the latest burst information, but does also include a base level of multi-criteria analysis.

Identification of pipeline renewals in the urban areas is targeted to link in with pipeline upgrades in the network under other drivers but also considers the linkages with other activity programmes (e.g. wastewater). The identification of specific renewals and design is scheduled to take place one year prior to construction.

A water meter renewal strategy has been developed. This renewal strategy takes into account accuracy of meters and highlights the optimum time for renewal.

8.3.4 Deferred Renewals

Deferred renewal is the shortfall in renewals required to maintain the service potential of the assets. This can include:

- renewal work that is scheduled but not performed when it should have been, and which has been put off for a later date (this can often be due to cost and affordability reasons);
- an overall lack of investment in renewals that allows the asset to be consumed or run-down, causing increasing maintenance and replacement expenditure for future communities.

Figure 17 compares Council's cumulative renewal expenditure and cumulative depreciation for this activity. If the renewals expenditure starts falling behind the accumulative depreciation it can indicate that the assets may not be being replaced or renewed at the rate at which they are being consumed. If this continues unchecked for too long, future communities will inherit a run-down asset, high maintenance costs and high capital costs to renew failing infrastructure.

For the first 10 years, Council's investment in renewals tracks slightly below depreciation. At Year 21, Council's investment in renewal starts to fall behind depreciation more significantly. This divergence is due primarily to the long useful life and age profile of Council's current assets. Most of Council's water assets are not due for replacement within the next 30 years. The significant investment programme in new assets Council has planned also contributes to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but, like the bulk of Council's current water assets, most don't need replacing within the next 30 years. While not shown here, Council has compared the likely renewal requirements for 100 years with depreciation over the same time. This assessment shows that the gap closes in the long-run.

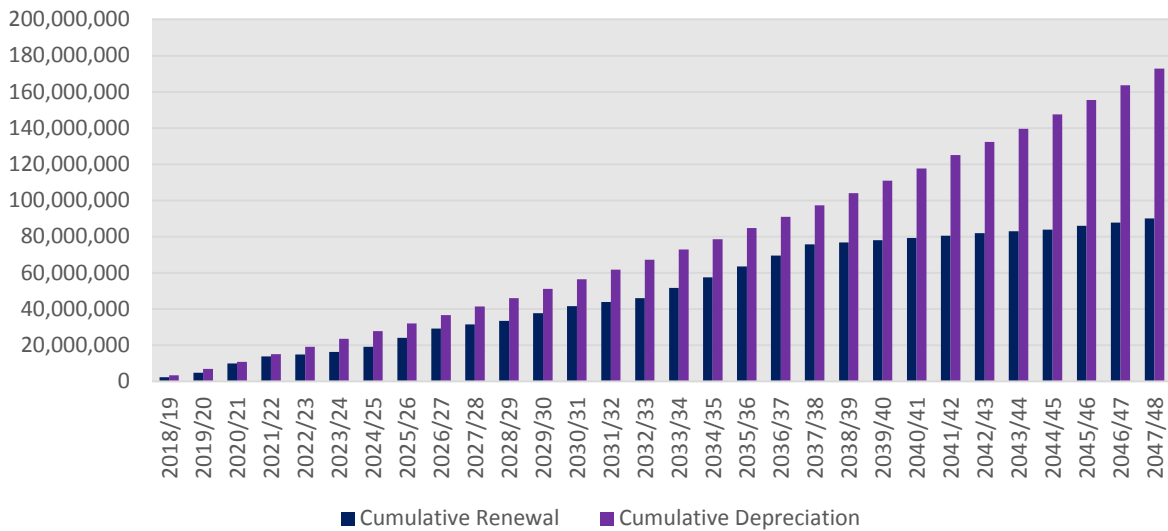


Figure 17: Cumulative Depreciation and Renewal Expenditure Comparison Including Inflation

8.3.5 Forecast Renewal Expenditure

Figure 18 provides a summary of forecast renewal expenditure for the next 30 years.

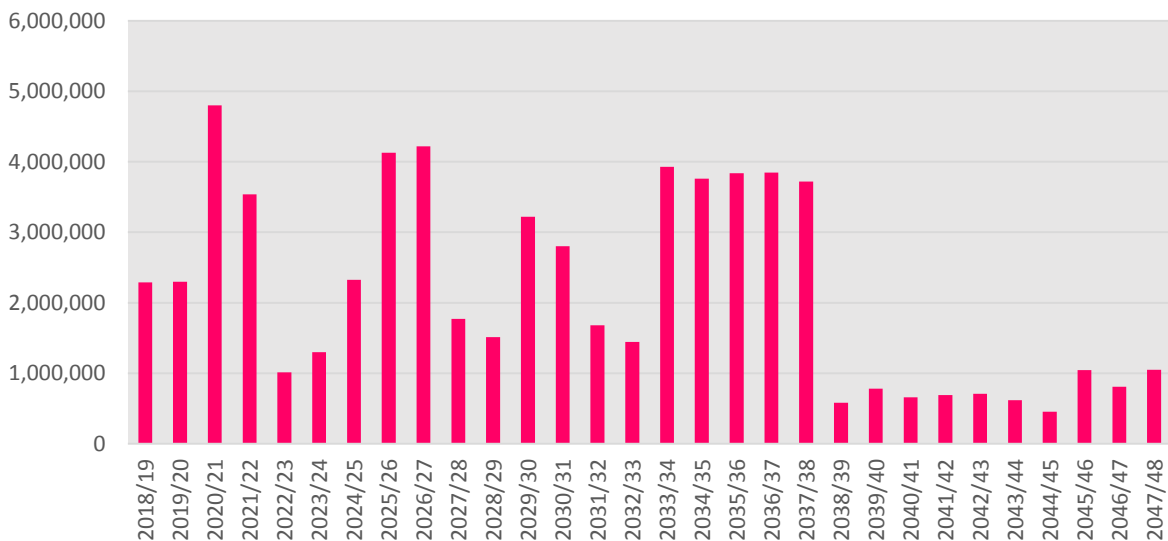


Figure 18: 2018 – 2048 Direct Renewals Expenditure Excluding Inflation

8.4 Asset Development

New capital expenditure is used to create new assets, expand or upgrade existing assets, or increase the capacity of existing assets beyond their original design capacity or service potential. This section summarises future new capital work requirements for this activity.

8.4.1 Key Asset Development Themes

Havelock North Inquiry and the DWSNZ

In order to comply with the DWSNZ, Council need to upgrade existing or build new water treatment plants (WTP). There are 13 WTP projects planned between 2018-2025. The first two projects are new WTPs for Motueka and Wakefield. These are followed by a major upgrade to the Brightwater WTP and upgrades to the remaining treatment plants.

Growth

Enabling growth is a priority. Council plans to provide new water infrastructure in Richmond and Motueka and infrastructure upgrades in Mapua/Ruby Bay.

Technology Improvement

SCADA, analytical testing equipment, water take and water metering devices.

8.4.2 Projects to Support Increasing Levels of Service

Council is planning the following key projects to increase levels of service:

- 88 Valley WTP & Pump Stations - Treatment Upgrades
- Dovedale Source - New Motueka River Valley Water Source
- Redwood Valley WTP & PS - Treatment Upgrades Golden Hills
- Redwood Valley WTP & PS - O'Connor's Creek Treatment Upgrade
- Motueka WTP (Parker Street)
- Brightwater WTP Upgrade
- Wakefield WTP - New plant at Spring Grove
- Collingwood WTP - Treatment Upgrade
- Richmond Source - Waimea Bore Pump Upgrade
- Richmond Reticulation - Nelson Pine Water Main Relocation
- Motueka Reticulation - Zone of Effect around Parker Street WTP

8.4.3 Projects to Support Growth

Council is planning the following key projects to address growth:

- Richmond South Low Level Reservoir Stage 1
- Richmond South Low Level Water Main
- Wakefield Reticulation - Upsize of Bird Lane water pipe
- Mapua Reticulation - Pomona Road Reservoir Upgrade
- Mapua Reticulation - Stage Coach Road Reservoir Upgrade
- Motueka Reticulation - Motueka West Water Main Stage 1

8.4.4 Forecast New Capital Expenditure

Councils forecast for new capital expenditure for this activity is shown in Figure 19 below.

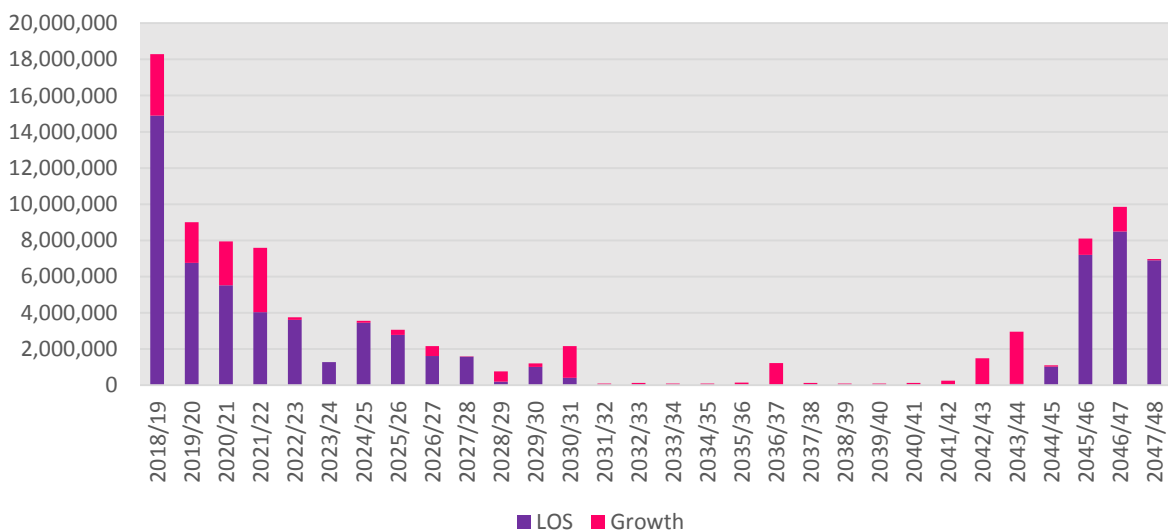


Figure 19: Direct New Capital Expenditure Excluding Inflation

8.5 Asset Disposal

Council does not have a formal strategy on asset disposals and as such it will treat each asset individually on a case by case basis when it reaches a state that disposal needs to be considered.

Asset disposal is generally a by-product of renewal or upgrade decisions that involve the replacement of assets. Assets may also become redundant for any of the following reasons:

- underutilisation;
- obsolescence;
- provision of the asset exceeds the required level of service;
- uneconomic to upgrade or operate;
- policy change;
- the service is provided by other means (e.g. private sector involvement);
- potential risk of ownership (financial, environmental, legal, social, vandalism).

Depending on the nature, location, condition and value of an asset it is either:

- made safe and left in place;
- removed and disposed of;
- removed and sold;
- ownership transferred to other stakeholders by agreement.

In most situations, assets are replaced at the end of their useful lives and are generally in poor physical condition. Consequently, the asset will be disposed of. In some situations, redundant pipes and associated infrastructure is abandoned and left in the ground. These pipes are decommissioned and capped at each end, and in some cases filled with grout or mortar. Council endeavor to capture the status and decommissioning treatment of abandoned pipes in the asset management systems. Typically, this information is provided in as built data and maintenance reports.

Occasionally the opportunity arises when abandoned pipes can be used as conduit or relined for other uses.

In some situations, an asset may require removal or replacement prior to the end of its useful life. In this circumstance, Council may hold the asset in stock for reuse elsewhere on the network. Otherwise, if this is not appropriate it could be sold off, transferred, disposed of or demolished.

When assets sales take place, Council aims to obtain the best available return from the sale and any net income will be credited to that activity. Council follows practices that comply with the relevant legislative requirements for local government when selling off assets.

Significant water assets programmed for decommissioning and disposal of include:

- Decommission Fearons Bush WTP planned for 2024/25 once the new Parker Street WTP is operational (2019)
- Decommission old Wakefield WTP planned for 2024/25 once the new Spring Grove WTP is operational (2019)

9 Financials

Council has planned a prudent financial approach to managing its assets and services. This section provides a summary of the total value of the activity and the investment that Council has planned to make over the next 30 years.

9.1 Funding Sources

The Water Supply activity is funded through a mixture of the following sources. The sources and their proportion of contribution is shown in Figure 20 below.

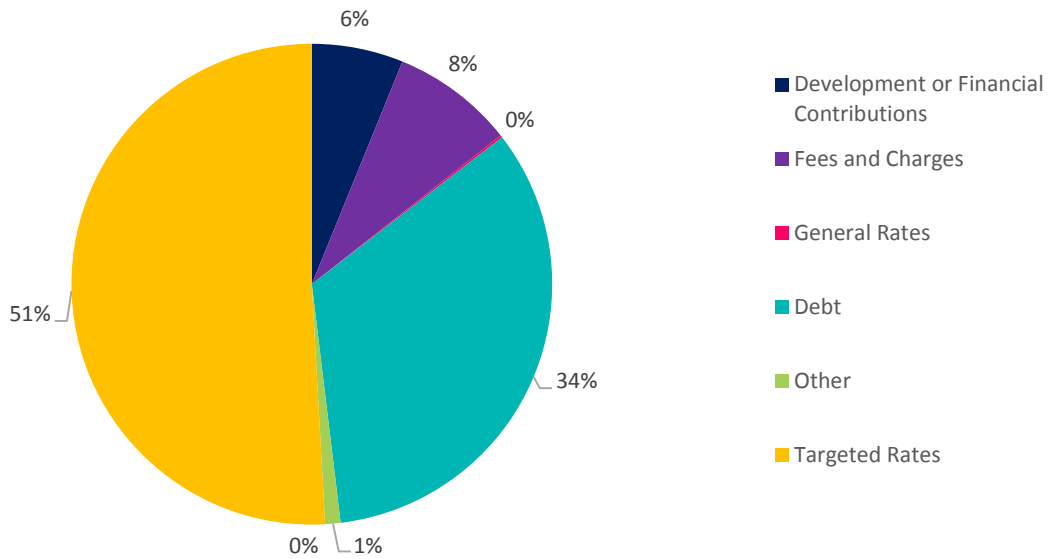


Figure 20: Sources of Water Supply Funding

9.1.1 Development Contributions

Council's Development and Financial Contributions Policy can be found on our website at www.tasman.govt.nz/policy/policies/development-contributions-policy

The Policy will be adopted in conjunction with Council's Long Term Plan and will come into effect on 1 July 2018.

The Policy sets out the development contributions payable by developers, how and when they are to be calculated and paid, and a summary of the methodology and rationale used in calculating the level of contributions.

The key purpose of the Policy is to ensure that growth, and the cost of infrastructure to meet that growth, is funded by those who cause the need for and the benefit from the new or additional infrastructure, or infrastructure of increased capacity.

There are three water supply development contributions in place. Which charge is applicable depends on what catchment the development is located in.

Table 25: Water Supply Development Contribution Charges as at 1 July 2018

Catchment	Development Contribution per HUD \$ (incl GST) *
Waimea	\$ 8,907
Motueka	\$ 5,456
Golden Bay	Nil
Rest of District	Nil

HUD = Household Unit of Demand

* The value of the Development Contribution shall be adjusted on 1 July each calendar year using the annual change in the Construction Cost Index.

9.1.2 Water Clubs

Council's 18 water supply schemes are divided into different clubs for the purposes of rating. The clubs include:

- Urban Water Club;
- Motueka;
- Dovedale;
- Eighty-Eight Valley;
- Redwoods.

Further information regarding the funding of this activity can be found in Council's Revenue and Financing Policy.

9.2 Asset Valuation and Depreciation

The Local Government Act 1974 and subsequent amendments contain a general requirement for local authorities to comply with Generally Accepted Accounting Practice ("GAAP").

Council requires its infrastructure asset register and valuation to be updated in accordance with Financial Reporting Standards and the AMP improvement plan.

The valuations summarised below have been completed in accordance with the following standards and are suitable for inclusion in the financial statements for the year ending June 2017.

- NAMS Group Infrastructure Asset Valuation Guidelines – Edition 2.0
- New Zealand International Public Sector Accounting Standard 17: Property, Plant and Equipment (PBE IPSAS 17) and PBE IPSAS 21 (Impairment of Non Cash Generating Assets)

9.2.1 2017 Valuation

Assets are valued every three years. The water supply assets were last revalued in April 2017 and are reported under separate cover¹. Key assumptions in assessing the asset valuations are described in detail in the valuation report.

The majority of information for valuing the assets was obtained from the Council's Confirm database. The data confidence is detailed in Table 26 below.

Table 26: Data Confidence

Asset Description	Confidence	Comments
Water Supply Assets	B - Good	The asset registers provide all the physical assets that make up each scheme. However, attribute information could be more detailed such as surface types etc.

¹ Tasman District Council Valuation of Non-Roading Infrastructure Assets as at 1 April 2017

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system.

The Base Useful Lives for each asset type as published in the NZIAVDG Manual were used as a guideline for the lives of the assets in the valuation. Generally, lives are taken as from the mid-range of the typical lives indicated in the Valuation Manual where no better information is available. Lives used in the valuation are presented in Table 27 following.

Table 27: Asset Lives

Item	Life (years)	Minimum Remaining Life (years)
Pipelines		
AC, unknown pipe	60	5
DI, CI, PVC, PE, Steel pipe	80	5
Miscellaneous pipeworks and fitting associated with treatment plants and pump stations	15	2
Valves, hydrants	50	5
Water meters, restrictors	15	2
Non Pipeline Assets		
Borewells	50	5
Pump chambers	80	5
Buildings	50	5
Reservoirs	80	5
Tanks	50	5
Small plant – pumps, chlorinating/UV equipment, generators	20	2
Electrical, control cabinets, telemetry, flow meters	15	2

9.2.2 Depreciation

Depreciation of assets must be charged over their useful life. Council calculates depreciation on a straight line basis on most infrastructural assets at rates which will write off the cost (or valuation) of the assets to their estimated residual values, over their useful lives.

The optimised replacement value, optimised depreciated replacement value, total depreciation to date, and the annual depreciation of the water supply assets are summarised in Table 28 and Table 29 below.

Table 28: Water Asset Valuation Summary 30 June 2017

Asset Type	Optimised Replacement Value (\$000)	Optimised Depreciated Replacement Value (\$000)	Annual Depreciation (\$000/yr)
Water Pipes	118,850	72,928	1,605
Water Non Pipe Assets	52,497	31,899	1,397
Total	171,347	104,827	3,002

Table 29: 2015 / 2017 Water Valuation Comparison

Year	Optimised Replacement Value (\$000)	Optimised Depreciated Replacement Value (\$000)	Annual Depreciation (\$000/yr)
2015	168,207	105,570	2,725
2017	171,347	104,827	3,002
% Increase	1.9%	0.7%	10.2%

Overall the water assets have increased in optimised replacement value by 1.9% since the 2015 valuations. The increase in the replacement values is due to the following reasons:

- increases in the unit rates of assets over the period;
- the addition of new assets to the utilities since 2015.

The percentage increase in annual depreciation is higher due to higher unit rate increases for lower life assets, eg supply meters.

9.3 Financial Summary

9.3.1 Funding Impact Statement

Council's Funding Impact Statement (FIS) for this activity is included in the table below. It summarises in one place how this activity will be funded and how those funds will be applied over the next 10 years.

Table 30: Water Supply Funding Impact Statement

	2017/18 AP \$000	2018/19 Budget \$000	2019/20 Budget \$000	2020/21 Budget \$000	2021/22 Budget \$000	2022/23 Budget \$000	2023/24 Budget \$000	2024/25 Budget \$000	2025/26 Budget \$000	2026/27 Budget \$000	2027/28 Budget \$000
SOURCES OF OPERATING FUNDING											
General rates, uniform annual general charges, rates penalties	212	56	56	56	56	56	56	54	11	5	0
Targeted rates	8,760	9,691	10,386	11,539	12,585	13,217	13,689	14,058	14,781	15,274	15,595
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees and charges	1,344	1,503	1,670	1,986	2,121	2,202	2,241	2,246	2,325	2,394	2,454
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees, and other receipts	393	336	332	334	334	332	335	344	342	330	327
TOTAL OPERATING FUNDING	10,709	11,586	12,444	13,915	15,096	15,807	16,321	16,702	17,459	18,003	18,376
APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	4,850	5,223	5,406	5,777	6,137	6,300	6,408	6,583	6,864	6,990	7,175
Finance costs	1,629	2,306	2,333	2,712	3,007	3,287	3,316	3,342	3,417	3,549	3,564
Internal charges and overheads applied	1,260	1,563	1,752	1,852	1,955	2,161	2,202	2,221	2,223	2,217	2,255
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF OPERATING FUNDING	7,739	9,092	9,491	10,341	11,099	11,748	11,926	12,146	12,504	12,756	12,994
SURPLUS (DEFICIT) OF OPERATING FUNDING	2,970	2,494	2,953	3,574	3,997	4,059	4,395	4,556	4,955	5,247	5,382

	2017/18 AP \$000	2018/19 Budget \$000	2019/20 Budget \$000	2020/21 Budget \$000	2021/22 Budget \$000	2022/23 Budget \$000	2023/24 Budget \$000	2024/25 Budget \$000	2025/26 Budget \$000	2026/27 Budget \$000	2027/28 Budget \$000
SOURCES OF CAPITAL FUNDING											
Subsidies and grants for capital expenditure	0	0	0	0	0	0	0	0	0	0	0
Development and financial contributions	609	1,697	1,697	1,697	1,516	1,516	1,516	1,627	1,627	1,627	1,306
Increase (decrease) in debt	3,591	24,079	5,637	6,547	3,375	328	(7,045)	1,544	2,661	1,229	(1,797)
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump sum contributions	0	0	0	0	0	0	0	0	0	0	0
Other dedicated capital funding	0	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF CAPITAL FUNDING	4,200	25,776	7,334	8,244	4,891	1,844	(5,529)	3,171	4,288	2,856	(491)
APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
- to meet additional demand	970	1,229	737	1,432	4,606	0	0	0	0	0	0
- to improve the level of service	600	6,205	7,857	4,862	3,142	2,648	1,320	3,582	3,198	1,444	1,747
- to replace existing assets	4,420	3,650	2,580	6,596	3,752	2,380	1,468	2,937	4,981	5,989	2,259
Increase (decrease) in reserves	(420)	(6,059)	(887)	(1,072)	(2,612)	875	(3,922)	1,208	1,064	670	885
Increase (decrease) in investments	1,600	23,245	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF CAPITAL FUNDING	7,170	28,270	10,287	11,818	8,888	5,903	(1,134)	7,727	9,243	8,103	4,891
SURPLUS (DEFICIT) OF CAPITAL FUNDING	(2,970)	(2,494)	(2,953)	(3,574)	(3,997)	(4,059)	(4,395)	(4,556)	(4,955)	(5,247)	(5,382)
FUNDING BALANCE	0	0	0	0	0	0	0	0	0	0	0

9.3.2 Project Drivers

All expenditure must be allocated against at least one of the following project drivers.

- Operation and Maintenance: operational activities that do not involve the renewal or upgrade of assets, or work that is necessary in order to provide on-going services at the agreed levels.
- Renewals: significant work that restores or replaces an existing asset towards its original size, condition or capacity.
- Increase Level of Service: works to create a new asset, or to upgrade or improve an existing asset, beyond its original capacity or performance.
- Growth: works to create a new asset, or to upgrade or improve an existing asset, beyond its original capacity or performance to provide for the anticipated demands of future growth.

This is necessary for two reasons as follows.

- Schedule 13(1) (a) and section 106 of the Local Government Act require Council to identify the total costs it expects to have to meet relating to increased demand resulting from growth when intending to introduce a Development Contributions Policy.
- Schedule 10(2)(1)(d)(i)-(iv) of the Local Government Act requires Council to identify the estimated costs of the provision of additional capacity and the division of these costs between changes to demand for, or consumption of, the service, and changes to service provision levels and standards.

All new works have been assessed against these project drivers. Some projects may be driven by a combination of these factors and an assessment has been made of the proportion attributed to each driver.

9.3.3 Scope Risk and Funded Capital Programme

When developing this work programme, Council needs to estimate how much to budget for each project. Often, Council cannot be certain what the actual costs or scope of the project will be because the design is yet to be completed. Typically, Council has more confidence in the cost and scope of projects that are planned within the first three years. After this, estimates are usually based on simple concept designs.

To address this uncertainty, Council has incorporated funding of scope risk into capital project budgets. The amount of scope risk included varies from 5% to 25% of the project estimate, depending on the expected complexity of the individual project. Based on history, it is unlikely that all individual projects will need the full amount of allocated scope risk funding, in reality there will be some under and over spending.

For the water, wastewater, and stormwater activities, Council has made an overall downward adjustment to the total capital programme of 5% per year. This adjustment acknowledges that Council is unlikely to use the full amount of scope risk in the programme for every project and enables Council to avoid over-funding the activities. We refer to this as the total funded capital programme.

9.3.4 Total Expenditure

Figure 21 and Figure 22 show the total expenditure for this activity over the next 10 and 30 years respectively.

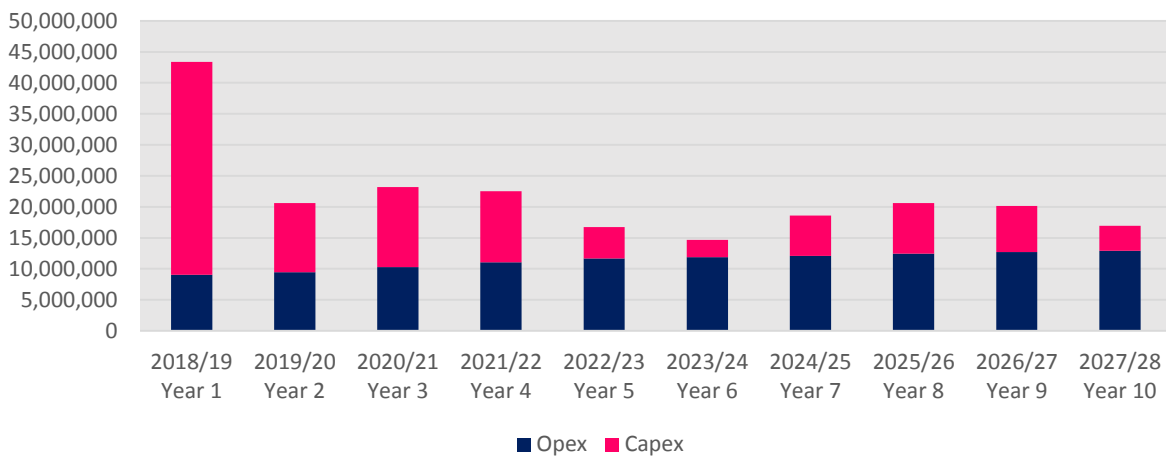


Figure 21: Total Annual Expenditure Years 1 to 10 Including Inflation

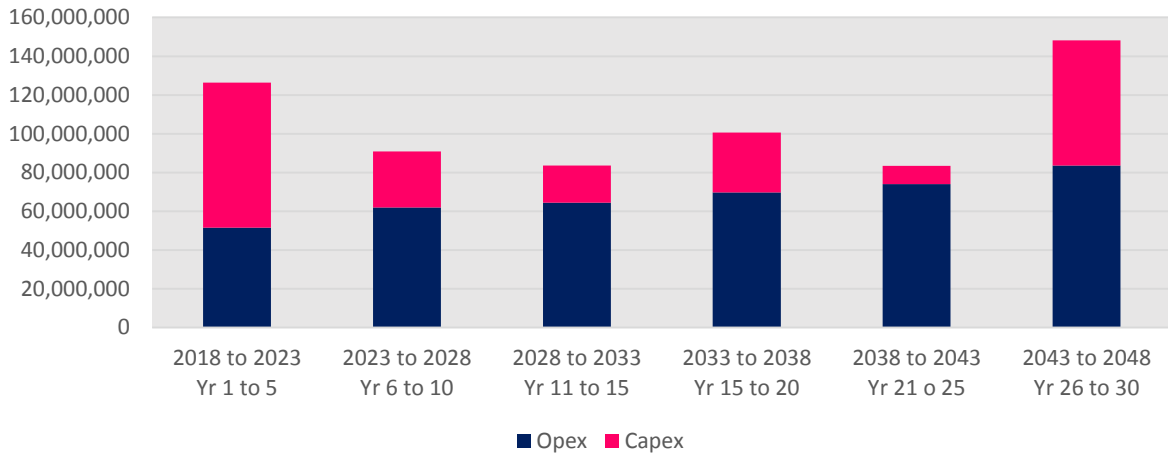


Figure 22: Five Yearly Total Expenditure Years 1 to 30 Including Inflation

9.3.5 Total Income

Figure 23 and Figure 24 show the total income for this activity over the next 10 and 30 years respectively.

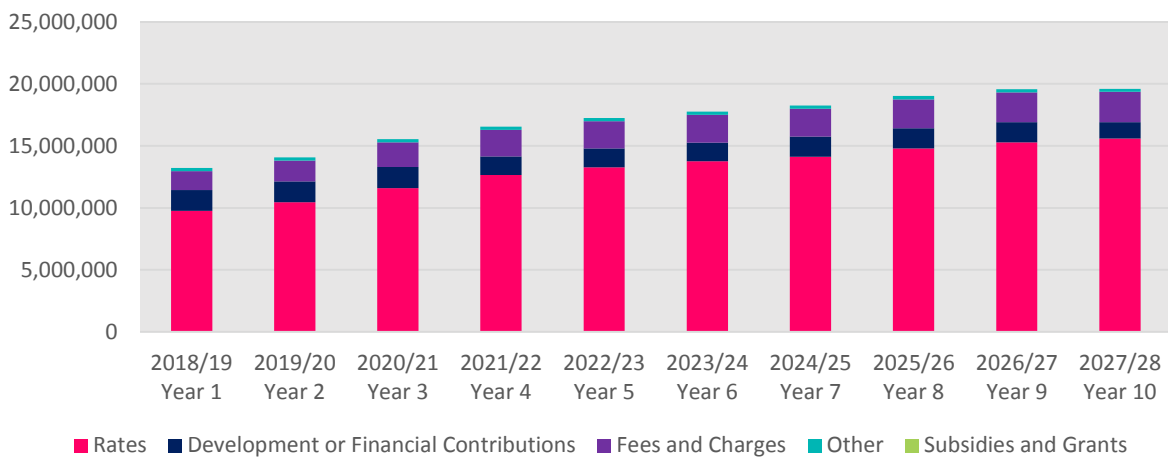


Figure 23: Total Annual Income Years 10

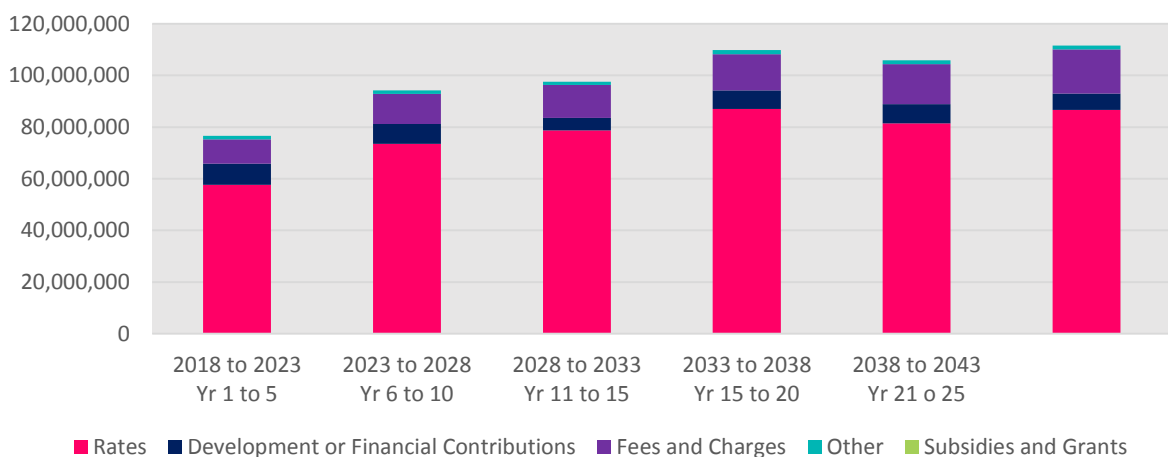


Figure 24: Five Yearly Total Income Years 1 to 30

9.3.6 Operational Costs

Figure 25 and Figure 26 show the total operating expenditure for the Water Supply activity for the first 10 and 30 years respectively.

Operational costs for the water supply activity are forecast to increase by an average of 4.3% per year for the first 10 years, and an average of 3.5% per year over 30 years. The most notable increases within the next 10 years, occur between Year 1 and Year 4. During this time, direct operating costs are increasing due to the inclusion of the Waimea Community Dam. Council has budgeted for the Dam to be fully operational by Year 4. Indirect costs increase primarily due to increasing loan interest costs associated with the capital programme for this activity. On top of this, both direct and indirect expenditure gradually increase due to inflation.

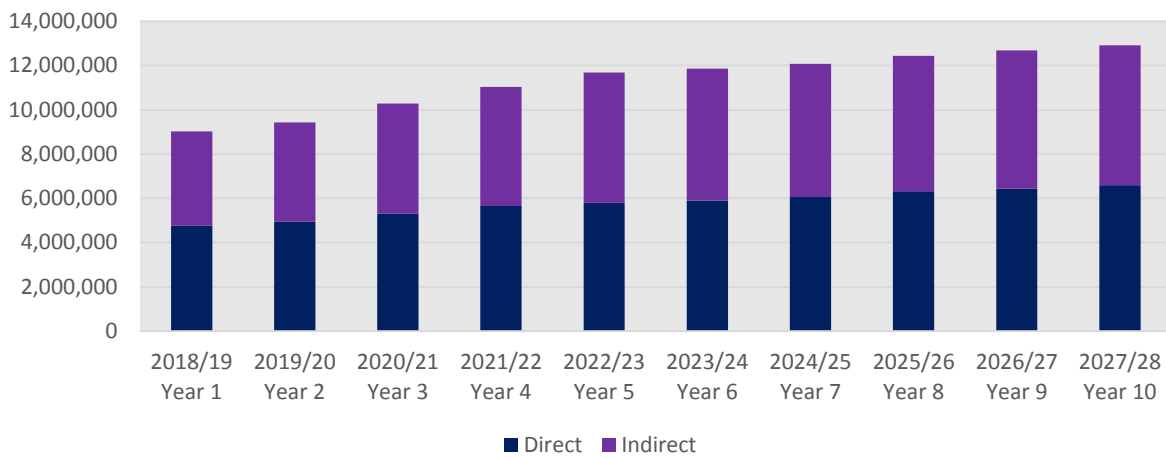


Figure 25: Direct and Indirect Annual Operating Costs Years 1 to 10 Including Inflation

Figure 26 show operating costs for water supply increase in the longer-term horizon.

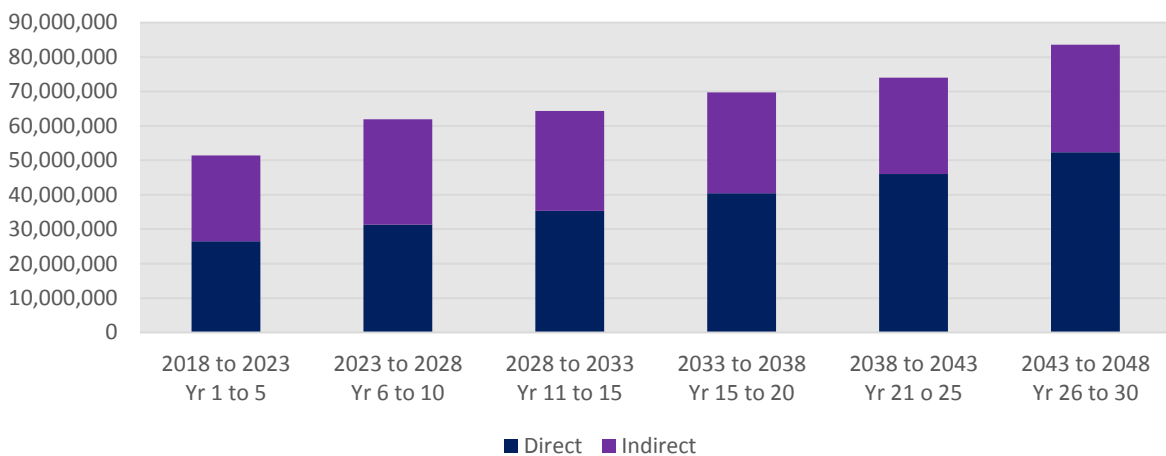


Figure 26: Direct and Indirect Five Yearly Operating Cost Years 1 to 30 Including Inflation

9.3.7 Capital Expenditure

Council plans to spend \$104 million on capital improvements over the next 10 years. Of this 14% is attributed to growth, 57% for level of service improvements, and 29% for asset renewal.

Council will invest most in level of service improvements for the first four years. This is due to the planned water treatment plant upgrades which are required to meet the NZ Drinking Water Standards and the Waimea Community Dam.

Council anticipates that the majority of investment being made to enable growth will be required within the first four years. After this, there should be sufficient capacity within the majority of the water supply network to enable growth for the next 20 years. Beyond the next 20 years, it is likely that additional infrastructure will be required to enable growth in the elevated areas of Richmond South. Accordingly, Council has planned to install high level reticulation and storage in Richmond South between 2040 and 2044.

Long term, capital expenditure notably increases in the Year 26 to Year 30 timeframe. This is due to the installation of the Motueka and Marahau new town supplies.

Figure 28 shows the estimated capital needs for the Water Supply activity have been prepared for the 30-year period.

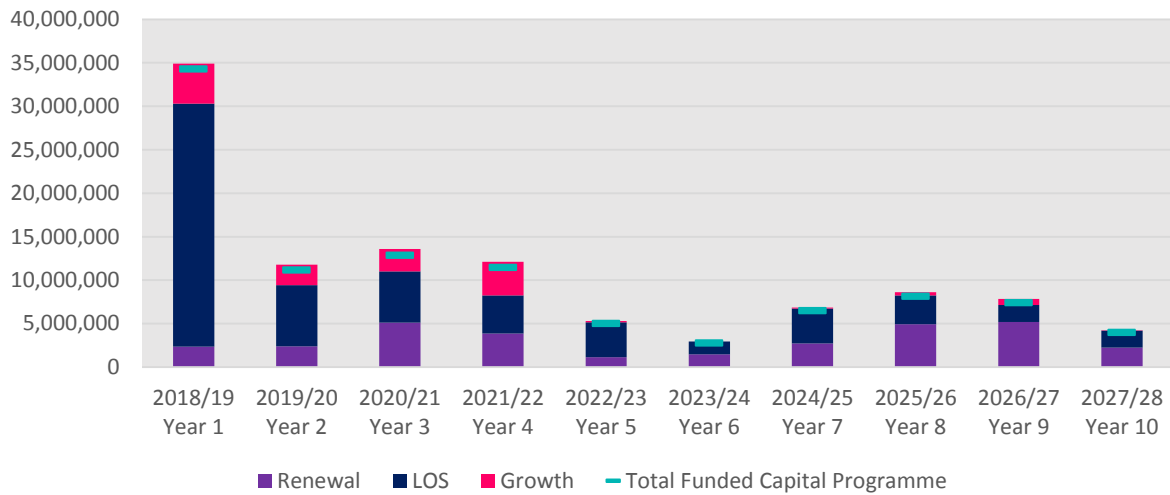


Figure 27: Annual Capital Expenditure Years 1 to 10 Including Inflation

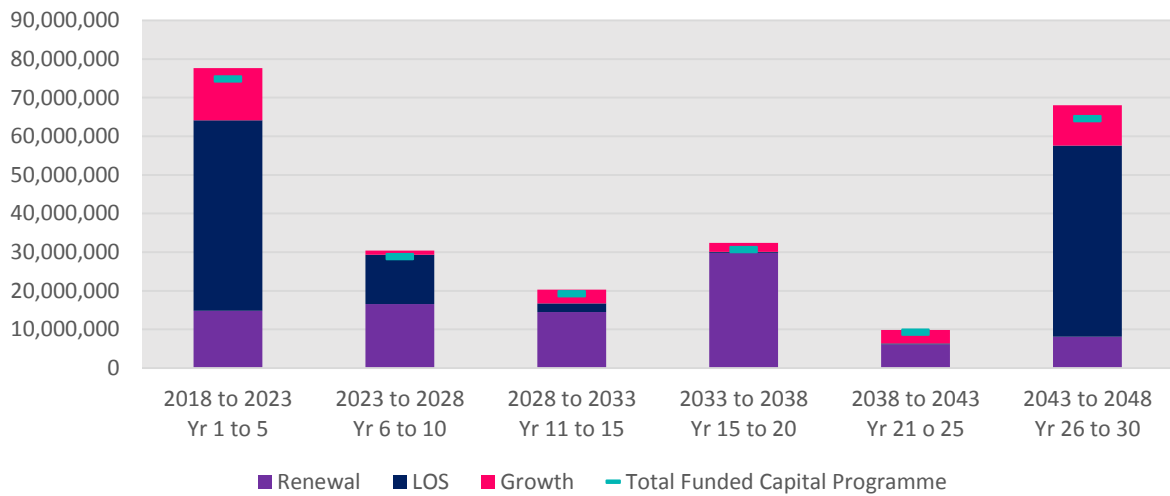


Figure 28: Five Yearly Capital Expenditure Years 1 to 30 Including Inflation

Figure 28 shows approximately \$228 million of capital expenditure is forecast over the 30-year period for the total funded capital programme. The peak in the last 5-year period of 2043-2048 represents projects for full reticulation of Motueka and Marahau.

10 Sustainability

Sustainability means that we effectively balance the needs of present and future communities. From an asset management perspective, sustainability is critical, as **many assets have a long lifespan and must be 'future-proofed'**. Council has a responsibility to manage this activity in way that supports the environmental, social, cultural and economic well-being of current and future generations. This section focuses on social, cultural and environmental sustainability.

The Local Government Act 2002 requires local authorities to take a sustainable development approach while conducting their business, taking into account the current and future needs of communities for good-quality local infrastructure, and the efficient and effective delivery of services.

Sustainable development is a fundamental philosophy that is embraced in the Council's Vision, Mission and Objectives, and is reflected in the Council's community outcomes. The levels of service and the performance measures that flow from these inherently incorporate the achievement of sustainable outcomes.

We measure sustainability against the triple bottom line framework that aims to create a balance between the three dimensions of performance, often referred to as **people, planet and profit (3P's)**.

People – The effects of the activity on the social and cultural wellbeing of our community.

Council is guided by the Community Outcomes to assist in determining how our decisions affect the social wellbeing of our community. Council undertake the activity to meet the level of service that is required to enhance community well-being.

Planet – The effects of the activity on the environment.

Water supply resources are taken from our groundwater aquifers or river surface takes. These water takes may affect river base flows and the aquatic habitat particular during droughts.

Profit – The financial and overall long-term economic viability of the activity.

Council operates, maintains and improves the water supply infrastructure assets on behalf of its ratepayers. Council uses its **Financial Strategy to guide the development of an affordable work programme.** Council's finances are managed within the set debt limits and rates income rises to ensure economic viability for current and future generations.

10.1 Negative Effects

Potential significant negative effects and the proposed mitigation measures for the Water Supply activity are listed below in Table 31 below.

Table 31: Negative effects from water supply activity

Effect	Description	Mitigation Measures
Construction of Future Schemes	<p>Social - Installation of water schemes do cause a disruption to the local community. The works can impact on traffic flow, and cause noise, dust and visual impacts. Shutdowns may result in residence not receiving water during the day.</p> <p>Economic - This may result in customers avoiding the works and therefore nearby business may suffer. Shutdowns may result in businesses not receiving water during the day.</p> <p>Environmental - Construction of water contracts typically creates noise, dust and mud. The TRMP and specific resource consents must be followed. Projects can involve acts such as de-watering, which requires the water to be discharged. Potential risk to the environment.</p>	<p>Public consultation.</p> <p>Notifying the public of the works through various forms of the media.</p> <p>Standard construction controls cover time of operation, noise and dust mitigation. In some cases, visual impacts are mitigated.</p>

Effect	Description	Mitigation Measures
Water Restrictions	<p>Social - Typically effects people who use the water for washing cars or watering the garden. This can frustrate the local community.</p> <p>Economic - This can have a larger impact on businesses that rely on using water for irrigation. This can cause a negative effect on these businesses.</p>	<p>Council is supporting the Waimea Community Dam project and has made allowances in the AMP for new water sources. Council has made allowances for improving demand management which will assist with making water usage more sustainable.</p>
Spillage of Chemicals Stored at Water Treatment Plants	<p>Social - The rate payer expects Council to handling all chemicals in the correct manner.</p> <p>Economic - Businesses which rely on nearby watercourses may not be able to operate until the chemical spill is resolved.</p> <p>Environmental - Tasman region is an environmentally sensitive area, any chemical spill will have a notable effect on the environment.</p>	<p>Appropriately trained staff and contractors.</p> <p>All chemicals are stored in the correct manner.</p>
Water Abstraction	<p>Water is abstracted from surface water and groundwater sources.</p> <p>Social - The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational.</p> <p>Economic- The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational.</p> <p>Environmental- The removal may add strain on a river system which is already very low and can significantly impact the ecology.</p>	<p>Council introduces water rationing during times of drought.</p> <p>Demand Management will assist with reducing the volume of water abstracted from the water source.</p> <p>Investigating new water sources and educating the public on water usage.</p> <p>Resource consents are in place, so Council cannot exceed a certain limit.</p>
Historic and Wahi Tapu Sites	<p>Cultural – Construction of water supply assets can potentially affect historic and wahi tapu sites.</p>	<p>Council undertakes consultation with stakeholders prior to undertaking works. Council also maintains a record of known heritage sites.</p>

10.2 Positive Effects

Potential positive effects are listed and described below in Table 32.

Table 32: Significant positive effects from water supply activity

Effect	Description
Economic Development	<p>Provision and maintenance of water supplies allows for the development of commercial businesses, industry and residential use, therefore, contributing to economic growth and prosperity in the district.</p> <p>The Council's management of the water supply activities uses best practice and competitive tendering to provide value for money for ratepayers and provides jobs for contractors.</p>

Effect	Description
Public Health	Safe drinking water supplies provide critical public health benefits related to sustenance and sanitation.
Safety and Personal Security	The majority of the Council's urban water supply network is built to accommodate firefighting requirements and supports protection of life and property.

10.3 Environmental Management

The statutory framework defining what activities require resource consent is the Resource Management Act (RMA) 1991. The RMA is administered locally by Tasman District Council, as a unitary authority, through the Tasman Resource Management Plan (TRMP). The following section discusses key consents that Council holds in order to undertake this activity.

10.3.1 Resource Consents

Council's Engineering Services Department has over 200 consents to manage and the number and type of resource consents relating to the water supply activity has increased over recent years. Some consents require active management to ensure reporting and monitoring conditions are met and allow the timely management for lodging new applications before existing consents expire. A register of all active consents including their conditions, compliance actions and expiry dates are managed in Bravegen.

The following list identifies resource consents that are either currently in the consent application/renewal process* or due to expire within the term that this activity management plan covers:

Table 33: Consents Under Renewal or Application

Water Supply Scheme	Consent No.	Consent Type	Expiry
Brightwater	NN020022	Water take and use	31/05/2017*
Collingwood	NN020325	Water take and use	31/05/2019
Redwoods (O'Connor's Creek)	RM110191V1	Water take and use	31/05/2017*
Redwoods (River Road)	RM110193V1	Water take and use	31/05/2017*
Redwoods (Golden Hills)	NN970139	Water take and use	31/05/2017*
Maupu/Ruby Bay	RM110192V1	Water take and use	31/05/2017*
Upper Takaka		Water take and use	31/05/2019

The following sections describe the different types of resource consents that are applicable to the water supply activity.

Water Takes

The TRMP sets the framework for water management and Chapter 31 (Rules for Water Take, Diversion, Use or Damming) outlines the legal rules for taking water. Council requires a consent to take water from surface or groundwater sources for provision of water to Council's 18 water supply schemes.

Land Use

Part II of the TRMP applies to land in the District including land that is the bed of any river, stream or lake. Chapter 16-18 states the general, zone, and areas rules applying to land uses. Resource consents may be required for the installation and maintenance of any water supply infrastructure including bores, WTP, and pipelines. Some WTPs have been designated to ensure future works can be carried out for future development.

Water Course, Dam and Weir Structures

As mentioned previously, Chapter 31 of the TRMP outlines the legal rules for using water. Separate resource consents are required for water supply infrastructure that diverts, alters or dams water. Such infrastructure may include dams and weir structures.

Discharge

Under the RMA and TRMP, resource consents in the form of discharge permits are required for all discharges of water and contaminants to the environment. Chapter 33 (Discharging to Land and Fresh Water) of the TRMP outlines the legal rules for discharging. Council has a legal obligation to manage the adverse effects from discharges from its network including untreated water and treated water. Chlorine is considered a contaminant to land and fresh water bodies. Water supply infrastructure such as bypass pipelines in WTP require a discharge consent (e.g. Pohara WTP).

Coastal Permit

Part III of the TRMP applies to the coastal marine area and some water supply infrastructure such as pipelines buried in an estuary require a coastal permit to disturb and occupy the foreshore and seabed. A separate permit is required for constructing infrastructure and another permit is required to undertake maintenance and repair work to existing infrastructure.

10.3.2 Resource Consent Reporting and Monitoring

The extent to which Council has been able to meet all of the conditions of each consent and NZDWS is reported in its Annual Report each year.

10.3.3 Property Designations

Designations are a way provided by the RMA of identifying and protecting land for future public works. There is a suite of designations held in the TRMP and these allows Council to plan and conduct water supply activities. Once given effect, a designation remains valid for the life of the TRMP or until the requiring authority removes or alters the designation. It is not always necessary to retain the designations for sites where water supply facilities have been developed, unless there is a likelihood of future expansion or other upgrades being required. Alterations to some designations (e.g., boundaries) and outline plans for proposed work may be required from time to time. Designations do not negate the ongoing need for regional resource consents (e.g., discharge permits) required for the designated site. Table 34 provides a summary of current designations. Council have an indefinite designations for most WTP, reservoirs and pump station sites. Exceptions are listed in Table 34 below.

Table 34: Summary of Public Water Supply Designations

ID	Location	Site Name/Function	Duration of Designation
D175	Hamama Road	Hamama Water Supply Intake	Indefinite – given effect
D188	Pigeon Valley Road, Wakefield	Wakefield Pump Station and well	Indefinite – given effect
D196	Unnamed Stream, Torrent Bay	Torrent Bay Water Supply Intake	Indefinite – given effect
D199	Haile Lane, Pohara	Pohara Valley Water Supply Intake	Indefinite – given effect
D206	State Highway 60, Takaka Hill	Upper Takaka Water Supply Intake	Indefinite – given effect
D244	Lower Queen Street and McShane Road, Richmond	Water Treatment and Wastewater Pump Station	20 years (Built 2015)
D245	McShane Road, Richmond	Water Wells	20 years
D246	216 Champion Road, Richmond	Richmond East High Level Reservoir	20 years (Built 2015)

11 Risk Management and Assumptions

This AMP and the financial forecasts within it have been developed from information that has varying degrees of completeness and accuracy. In order to make decisions in the face of these uncertainties, assumptions have to be made. This section documents the uncertainties and assumptions that Council considers could have a significant effect on the financial forecasts, and discusses the potential risks that this creates.

11.1 Our Approach to Risk Management

A risk is any event that has the potential to impact on **the achievement of Council's objectives**. The **potential impact of a risk** is measured by a combination of the likelihood it could occur, and the magnitude of its consequences on objectives.

Council adopted a Risk Management Policy in November 2017 and is in the process of improving our risk management processes. The main purpose of these improvements is to support better planning and decision-making, and to increase **the chance of achieving Council's objectives**.

Council's Risk Management Framework is still being developed but key components will be:

- Risk Categories:
- Service delivery
- Financial
- Governance and Leadership
- Strategic
- Reputation
- Legal
- Regulatory
- Health & Safety
- Security
- Business Continuity
- Table of Consequences which help set the Risk Appetite
- Enterprise Risk Register
- identifying risks
- measuring likelihood, consequence and severity
- documenting controls, actions and escalation
- Monitoring and Reporting, including to Senior Management and Audit and Risk Committee as appropriate

Council has adopted an approach to risk management following the Australian/New Zealand Standard ISO 31000:2009 Risk Management – Principles and guidelines.

Refer to Council's Risk Management Policy for further information.

11.2 Activity Risks and Mitigation

The key risks and mitigation measures for this activity are summarised in Table 35.

Table 35: Key Risks

Risk Event	Mitigation Measures
Water contamination	<p>Current</p> <p>Source waters are protected by the National Environmental Standard (NES) for Drinking Water and National Policy Statement for Freshwater.</p> <p>Individual scheme risks documented in Water Safety Plan for that scheme. WSPs contain contingency plans for emergency events</p> <p>Proposed</p> <p>Changes to some rules within TRMP around bores</p> <p>Create centralized emergency response plans (ERPs)</p>
Catastrophic failure of a network structure	<p>Current</p> <p>routine maintenance and inspections are included in the network maintenance contracts. reactive inspection following extreme weather events.</p> <p>Proposed</p> <ul style="list-style-type: none"> • additional seismic strengthening of reservoirs
Premature deterioration or obsolescence of an asset	<p>Current</p> <ul style="list-style-type: none"> • maintenance performance measures included in the network maintenance contracts. • routine inspections. <p>Proposed</p> <ul style="list-style-type: none"> • increased assessment and progressive renewal of lower quality pipe materials
Sub-optimal design and/or construction practices or materials	<p>Current</p> <ul style="list-style-type: none"> • Engineering Standards and Policies document and construction inspections contract quality plans. • professional services and construction contract specifications. • third party reviews. <p>Proposed</p> <ul style="list-style-type: none"> • ongoing staff training
Ineffective stakeholder engagement e.g., iwi, Heritage New Zealand, community groups	<p>Current</p> <ul style="list-style-type: none"> • Council holds regular meetings with iwi • the Council's GIS software includes layers identifying cultural heritage sites and precincts. Council staff apply for Heritage New Zealand when these known sites are at risk of damage or destruction • project management processes and the Council's consultation guidelines are followed
Failure to gain property access	<p>Current</p> <ul style="list-style-type: none"> • stakeholder management • works and entry agreements • use of the Council's property team to undertake land purchase negotiations • Public Works Act
Growth greater than expected	<p>Current</p> <ul style="list-style-type: none"> • monitor subdivision and building consent data • monitor forecast with each growth model review
Motueka Groundwater contamination	<p>Current</p> <ul style="list-style-type: none"> • monitor groundwater quality • maintain liaison with Medical Officer of Health

11.2.1 Natural Hazards and Resilience

The size and diverse nature of the Tasman landscape makes the region susceptible to a wide range of natural hazards. Tasman lies within a seismically active zone, has five major river catchments and a large coastal environment. As a result, Tasman residents have experienced the damaging effects of landslides, flooding and coastal inundation.

Some hazards have a slower onset period, for example sea level rise associated with the effects of climate change, and other hazards such as earthquakes can have little to no warning. Regardless of these timeframes, Council needs to plan for these hazards and determine whether adaption, mitigation, or retreat is appropriate.

Council's Infrastructure Strategy provides details of the relevant natural hazards in context to Council infrastructure and outlines how we intend to manage risk and improve resilience. In addition to this, the Regional Civil Defence Emergency Management Group Plan provides a risk profile that outlines and ranks these natural (and other) hazards. The risk assessment determines the likelihood and consequence of the hazard occurring ranges between low to very high likelihood and insignificant to catastrophic consequences. For example on the extreme end of the scale, an Alpine Fault earthquake is considered possible and would result in catastrophic consequences for both people and infrastructure.

Council needs to ensure it has robust planning in place and provides infrastructure that is resilient. Council is taking a long-term strategic approach by undertaking risk, resilience and recovery planning to provide better information on infrastructure resilience requirements. This planning will cover Transportation and Three Waters activities and includes a total budget of \$160,000 over the next two years (2018-20). Council will also continue to focus on planning and managing its critical assets and lifelines networks to ensure that the appropriate level of effort is being made to better manage, maintain and renew them.

As well as ensuring its assets are resilient, Council has a range of financial provisions to assist with response to and recovery from major damaging events. These include:

- Annual emergency funding;
- An established Emergency Fund that Council aims to maintain to a value of \$12.8 million;
- **Ability to reprioritise Council's capital programme;**
- Insurance cover of 40% of the costs of a catastrophic disaster event, up to \$125m;
- Central Government support of up to 60% through the Local Authority Protection Programme;
- NZ Transport Agency subsidy of at least 51% for subsidies transportation asset reinstatement.

11.3 Assumptions and Uncertainties

Table 36 outlines the uncertainties and assumptions that Council consider could have a significant effect on the financial forecasts, and discusses the potential risks that this creates.

Table 36: Generic Assumptions and Uncertainties

Type	Uncertainties	Assumption	Discussion
Financial	Unless stated it can be unclear whether financial figures include inflation or not, as well as whether GST has been included or not.	That all expenditure has been stated in 1 July 2017 dollar values and no allowance has been made for inflation and all financial projections exclude GST unless specifically stated.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of each activity if inflation is higher than allowed for. Council is using the best information practically available from Business and Economic Research Limited (BERL) to reduce this risk.

Type	Uncertainties	Assumption	Discussion
Asset Data Knowledge	Council has inspection and data collection regimes in place for assets. These regimes do not allow for entire network coverage at all times. The Council's aim is to strike the right balance between adequate knowledge and what is practical.	That Council has adequate knowledge of the assets and their condition so that planned renewal works will allow Council to meet the proposed levels of service.	There are several areas where Council needs to improve its knowledge and assessments, but there is a low risk that the improved knowledge will cause a significant change to the level of expenditure required.
Growth Forecasts	Growth forecasts are inherently uncertain and involve many assumptions. Council uses Stats NZ projections as the basis for its growth planning, but these will vary depending on actual birth and death rates as well as net migration.	That the district will grow or decline as forecast in its Growth Model.	Growth forecasts are used to determine infrastructure capacity and when that capacity will be required. If actual growth varies significantly from what was projected, it could have a moderate impact on the Council's plans . If higher, new or additional infrastructure may be required quicker than anticipated. If lower, Council may be able to defer the delivery of new or additional infrastructure.
Project Timing	Multiple factors affect the actual timing of projects e.g.: Consents Access to land Population growth Timing of private developments	That projects will be undertaken when planned.	The risk of the timing of projects changing is high due to factors like resource consents, third party funding, and land acquisition and access. Council tries to mitigate these issues by undertaking the investigation, consultation and design phases sufficiently in advance of when construction is planned. If delays occur, it could have an impact on the levels of service and the Council's financing arrangements.
Project Funding	Council cannot be certain that it will receive the full amount of anticipated subsidy or contribution. It depends on the funder's decision making criteria and their own ability to raise funds.	That projects will receive subsidy or third party contributions at the anticipated levels.	The risk of not securing funding varies and depends on the third party involved. If the anticipated funding is not received it is likely that the project will be deferred which may impact levels of service.

Type	Uncertainties	Assumption	Discussion
Accuracy of Cost Estimates	Project scope is often uncertain until investigation and design work has been completed, even then the scope can change due to unforeseen circumstances. Even if the scope has certainty there can be changes in the actual cost of work due to market competition or resource availability.	That project cost estimates are sufficiently accurate enough to determine the required funding level.	The risk of large underestimation is low; however, the importance is moderate as Council may not be able to afford the true cost of the project. Council tries to reduce this risk by undertaking reviews of all estimates and including an allowance for scope risk based on the complexity of the project.
Land Access and Acquisition	Land access and acquisition is inherently uncertain. Until negotiations commence, it is difficult to predict how an owner will respond to the request for access or transfer.	That Council will be able to secure land and/or access to enable completion of projects.	The risk of delays to projects or changes in scope is high due to the possibility of delays in obtaining access. Where possible, Council undertakes land negotiations well in advance of construction to minimise delays and scope change. If delays do occur, they may affect the level of service that Council provides.
Legislation Changes	Often Central Government changes legislation in response to events where the need for change is identified. It is difficult to predict what events may occur and the associated response. Election of a new Government also introduces uncertainty as to what policies they will implement.	That there will be no major changes in legislation or policy.	The risk of major change is high due to the changing nature of the Government and its policies. If major changes occur, it is likely to have an impact on the required expenditure. Council has not planned expenditure to specifically mitigate this risk.
Emergency Reserves	It is impossible to accurately predict when and where a natural hazard event will occur. Using historic trends to predict the future provides an indication but is not comprehensive.	That the level of funding reserves combined with insurance cover will be adequate to cover reinstatement following emergency events.	Funding levels are based on historic requirements. The risk of requiring additional funding is moderate and may have a moderate effect on planned works due to reprioritization of funds.

Type	Uncertainties	Assumption	Discussion
Network Capacity	Council uses a combination of as built data, network modelling and performance information to assess network capacity. The accuracy of the capacity assessment is based on the accuracy of asset and performance data.	That the Council's knowledge of network capacity is sufficient enough to accurately programme works.	If the network capacity is higher than assumed, Council may be able to defer works. The risk of this occurring is low, however it should have a positive impact on the community because the level of service can be provided for longer before requiring additional capital expenditure. If the network capacity is lower than assumed, Council may be required to advance capital works projects to provide the additional capacity sooner than anticipated. The risk of this occurring is low, however it could have a significant impact on expenditure.
Climate change	Continued emissions of greenhouse gases will cause further warming and changes in all parts of the climate system. The International Panel on Climate Change (IPCC) has developed four scenarios named RCPs (Representative Concentration Pathways). They represent different climate change mitigation scenarios with varying levels of CO2 emission (low – medium – high). The likelihood of any of the scenarios occurring as predicted is uncertain and depends on many different factors.	<p>Council uses the latest climate predictions that have been prepared by NIWA for New Zealand and more specifically for the Tasman District.</p> <p>The anticipated effects from climate change in Tasman District include:</p> <ul style="list-style-type: none"> • An increase in seasonal mean temperature and high temperature extremes • An increase in rainfall in winter for the entire district and varying increases of rainfall in other seasons in different areas. • Rising sea levels, increased wave height and storm surges. <p>Floods, landslides, droughts and storm surges are likely to become more frequent and intense</p>	<p>It is likely that risk of low lying land being inundated from the sea, and damage to Council property and infrastructure from severe weather events, will increase.</p> <p>Council will need to monitor the level of sea level rise and other impacts of climate change over time and review its budgets, programme or work and levels of service accordingly.</p>

Table 37: Water Specific Assumptions and Uncertainties

Type of Uncertainty	Description
Secure Water Source for Waimea Basin	Council cannot be certain what the actual climatic conditions of the future will be, nor the demand for community water supplies, but has assumed both will increase. Council has instigated a process to secure an augmented water source in the Waimea Basin to address the risks associated with drought, increasing demand, and existing over subscription of the aquifers. Council's preferred solution is the construction of the Waimea Community Dam. Council has assumed that the dam will be built as planned. If this is not the case, Council will need to implement an alternative urban water augmentation solution or demand management measures to addresses the risk and demand. Without the dam, there will be greenfield growth areas in Brightwater, Richmond and Mapua that Council will not be able supply water to. In a 'no dam' scenario, there will be associated infrastructure planned for these areas that will no longer be necessary, or the timing may be delayed until an alternative water supply source is found.
Havelock North Inquiry	An inquiry into the Havelock North drinking water contamination incident has been undertaken by the Government. Recommendations have been released but uncertainty remains about which of these recommendations will be made mandatory. Some recommendations relates to water from previously 'secure' sources' and network disinfection (permanent chlorination). Council is planning to incorporate emergency chlorination in its water treatment plant upgrades. Council has not planned for permanent chlorination. If the Government requires continuous chlorination of all drinking water supplies, it is estimated this would require additional capital expenditure of approximately \$1 million to apply this to all of Council's urban water schemes and an increase in annual operating expenditure of approximately \$50,000 per annum.
Fluoridation of Water Supply	Central Government is currently considering a Bill, which if passed would give power to District Health Boards to make decisions and give directions about the fluoridation of local government drinking water supplies in their areas. It is unclear whether the Bill will be successful and what the actual implications for Council will be. For this AMP, Council has assumed that its drinking water supplies will not be fluoridated. If the bill is passed and the Nelson Marlborough District Health Board instructs Council to fluoridate its supplies, it will create additional capital and operating costs.
Industrial Water Usage	Council cannot be certain about the quantity of water that industrial users will require. Council has assumed that future consumption by existing industries will be in line with historic use. Council has planned for one additional wet industry in a medium growth scenario and two wet industries in a high growth scenario. If consumption is significantly different than assumed, it may have an impact on Council's funding requirements. If growth is significantly different to the medium or high projections, the number of wet industries may be different.
Asset information	Council is uncertain about the impact that improved asset information (condition & performance data) will have on asset management. Council assumes that planned data, process and systems improvements will be realised. Improvements will likely affect the renewals budget and programme in the future.
Renewals	Council cannot be certain how long each individual asset will last. To address this uncertainty, Council assigns an average expected life for types of assets to assist with renewal planning. Some assets will fail before reaching the end of their expected life useful life, and some will last longer. Council has assumed that it will be able to manage this variance within its budges it set by prioritizing renewals annually.

12 Asset Management Processes and Practices

Good quality data and asset management processes are the heart of effective planning. This section describes our approach to asset management, defines the appropriate practice levels, and provides an overview of our asset management systems and data that underpins the water supply activity.

12.1 Appropriate Practice Levels

The Office of the Auditor General (OAG) has chosen to use the International Infrastructure Management Manual (IIMM) as the benchmark against which New Zealand councils measure their activity management practices. There are five maturity levels in the IIMM: Aware, Basic, Core, Intermediate and Advanced. The IIMM sets out what the requirements are for each level against each area of the activity management system.

In February 2017, Council reviewed its Activity Management Policy and adopted an updated version. The Policy sets out the Council's activity management objectives and appropriate levels of practice. For the water supply activity, Council has determined that the appropriate level of practice is an 'intermediate level' with 'advanced level' of practice for demand forecasting, asset register data and asset condition.

12.2 Service Delivery

12.2.1 Activity and Asset Management Teams

Council has an organisational structure and capability that supports effective asset management planning. Multiple teams across Council are responsible for the different aspects of activity and asset management. The focus of the teams ranges from a strategic focus at the Long Term Plan/Infrastructure Strategy level, which involves a cross-Council team, through to detail/operational focus at the Operational team level.

Within the Engineering Services department, the asset management planning function is managed by the Activity Planning team. Operations are the responsibility of the Utilities and Transportation teams, while Projects and Contracts are managed by the Programme Delivery team.



Figure 29: Teams Involved in Activity and Asset Management

The Activity Planning Team is responsible for the update of the activity management plans every three years, as well as implementation of the improvement plan. Each plan is assigned to the respective Activity Planning Advisor who is **responsible for updating it. The Activity Planning Advisor works in with the activity's Asset Engineer to ensure that the current and future operating and maintenance aspects of the activities are adequately incorporated into the document.** All activity management plans are reviewed by the Activity Planning Programme Leader who holds a National Diploma in Infrastructure Asset Management. The quality assurance process for the Engineering Services activity management plans is provided below.

- Preparation Activity Planning Advisor
- Check Utilities or Transportation Manager, and relevant Asset Engineer
- Review Activity Planning Programme Leader
- Approve Engineering Services Manager
- Adopt Full Council

12.2.2 Staff Training

Council maintains an annual budget for staff training that is managed by the Engineering Services Manager for the Engineering Services department. This budget allows for continued development of staff to ensure that best practice is maintained and that Council retains the skills needed to make improvements in asset management practices. This includes on-going technical and professional training as well as specific asset management training.

12.2.3 Professional Support

The Engineering Services Department has a need to access a broad range of professional service capabilities to undertake investigation, design and procurement management in support of its water supply activity. There is also a need to access specialist skills for design, planning and policy to support the in-house management of **the Council's networks, operations and maintenance.**

To achieve this Council went to the open market in late 2013 for a primary professional services provider as a single **preferred consultant to undertake a minimum of 60% in value of the Council's infrastructure professional services programmes.** The contract was awarded to MWH New Zealand Ltd (now Stantec NZ), beginning on 1 July 2014 with an initial three-year term and two three-year extensions to be awarded at the Council's sole discretion. **In 2017, the first of these discretionary three-year extensions was granted, with the proportion of Council's professional services programmes reduced to 50%.** In addition to this, a secondary professional service panel was also appointed through an open market tender process for a period of three years, to provide professional services that will not be supplied by Stantec.

12.2.4 Procurement Strategy

Council has a formal Procurement Strategy that it follows in order to engage contractors and consultants to assist the Engineering Services department. This strategy describes the procurement environment that exists within the Tasman District. It was developed following a three-year review of the strategy and was approved in November 2013. It principally focuses on Engineering Services and is consistent with whole-of-government procurement initiatives.

12.2.5 Service Delivery Reviews

In 2014, Section 17A was inserted into the Local Government Act, which requires Council to review the cost effectiveness of its current arrangements for providing local infrastructure, services, and regulatory functions at regular intervals. Reviews must be undertaken when service levels are significantly changed, before current contracts expire, and in any case not more than six years after the last review. In addition to the regular reviews, the Act requires Council to complete an initial review of all functions by August 2017.

Table 38 below summarises the review that have been completed to date and when the next review is required for this activity.

Table 38: Summary of review

Scope of Review	Summary of Review	Review Date	Next Review
Three Waters Operations & Maintenance Contract	An initial review found that current operations & maintenance contract arrangements were appropriate and that the new contract would be procured on a similar basis. A full review is to be conducted in collaboration with Nelson City Council at a later date.	2017	2022

In addition to the Section 17A reviews, the Engineering Services department reviewed its current capability and capacity against the requirements of the future programmes of work set out in its activity management plans. To enhance the department's ability to deliver the capital works programme the following actions have been taken:

- undertaken a detailed review of the capital programme for the next five years to better understand project complexities and delivery requirements;
- implemented Planview a new project management system to track and report project delivery progress;
- increased the number of Project Managers from 4 to 5.5 full time equivalent staff resources;
- introduced enhanced performance requirements for our lead technical consultant for delivery of technical advice and engineering design;
- tendered for a new supporting professional service panel with enhanced performance requirements.

12.3 Asset Management Systems and Data

12.3.1 Information Systems and Tools

Council has a variety of systems and tools that support effective operation and maintenance, record asset data, and enable that data to be analysed to support optimised life-cycle management. These are detailed below in Figure 30: below. There is a continual push to incorporate all asset data into the core asset management systems where possible; where not possible, attempts are made to integrate or link systems so that they can be easily accessed.

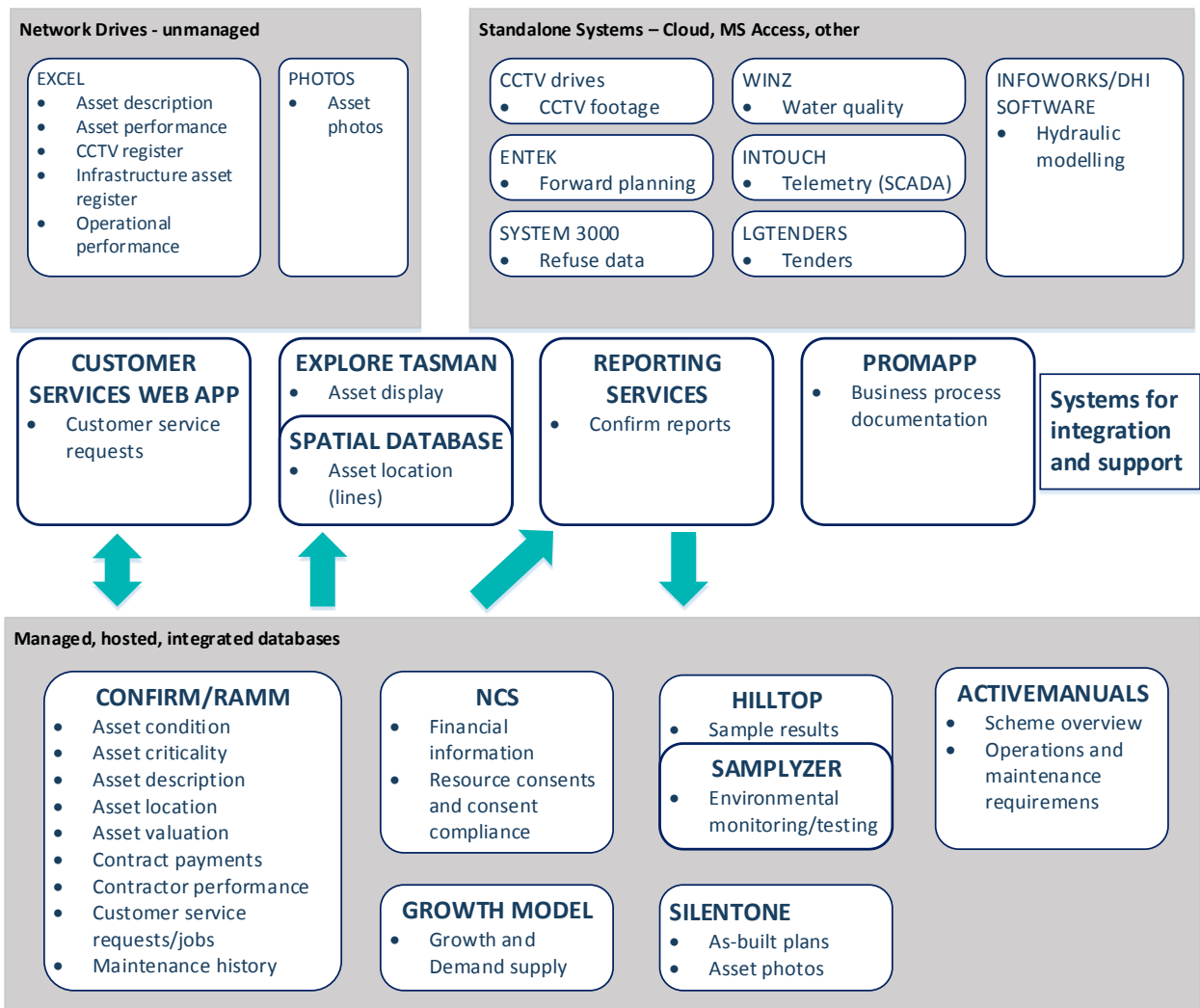


Figure 30: Systems Used for Asset Management

12.3.2 Asset Data

Table 39 summarises the various data types, data source and how they are managed within Council. It also provides a grading on data accuracy and completeness where appropriate.

Table 39: Data Types and Information Systems

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
As-built plans	SilentOne	As-built plans are uploaded to SilentOne, allowing digital retrieval. Each plan is audited on receipt to ensure a consistent standard and quality.	2	2
Asset condition	Confirm	Assets are inspected by a consultant or staff and the inspection information is entered directly into Confirm using the Connect mobile application.	N/A	N/A

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
Asset criticality	Confirm	When a new asset is created, the activity planner and engineer will make an assessment on criticality. Criticality of asset can be modified by authorized users should circumstances change.	N/A	N/A
Asset description	Confirm / spreadsheets	All assets are captured in Confirm's Site and Asset modules, from as-built plans and maintenance notes. Hierarchy is defined by Site and three levels of Asset ID (whole site, whole asset or asset). Assets are not broken down to component level except where required for valuation purposes. It is also possible to set up asset connectivity, but this hasn't been prioritised for the future yet. Detail on some datasets held in spreadsheets relating to Utilities Maintenance Contract; work is in progress to transfer this detail to Confirm as resourcing allows.	2	2
Asset location	Confirm (point data) / GIS (line data)	Co-ordinates for point data completely (NZTM) describe spatial location. Line data links to GIS layers that describe the shape.	2	2
Asset valuation	Confirm	Valuation of assets done based on data in Confirm and valuation figures stored in Confirm.	2	2
Contract payments	Confirm	All maintenance and capital works contract payments are done through Confirm. Data on expenditure is extracted and uploaded to NCS.	N/A	N/A
Contractor performance	Confirm	Time to complete jobs is measured against contract KPIs through Confirms Maintenance Management module.	N/A	N/A
Corporate GIS browser	Explore Tasman	Selected datasets are made available to all Council staff through this internal GIS browser via individual layers and associated reports.	N/A	N/A
Customer service requests	Customer Services Application / Confirm	Customer calls relating to asset maintenance are captured in the custom-made Customer Services Application and passed to Confirm's Enquiry module or as a Ramm Contractor Dispatch.	N/A	N/A
Environmental monitoring / testing	Hilltop / spreadsheet	Laboratory test results performed on monitoring and testing samples (from treatment plants and RRCs) are logged direct into Hilltop via an electronic upload from the laboratories. Due to historical difficulties in working with Hilltop data, it is duplicated in spreadsheets.	2	2

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
Financial information	NCS	<p>The Council's corporate financial system is NCS, a specialist supplier of integrated financial, regulatory and administration systems for Local Government. Contract payment summaries are reported from Confirm and imported into NCS for financial tracking of budgets.</p> <p>NCS also holds Water billing information, while asset details and spatial component are recorded in Confirm and cross-referenced.</p>	N/A	N/A
Infrastructure Asset Register	Spreadsheet	High level financial tracking spreadsheet for monitoring asset addition, disposals and depreciation. High level data is checked against detail data in the AM system and reconciled when a valuation is performed.	2	2
Forward planning	Spreadsheets GIS Mapping	Forward programmes for the Council's activities are compiled in excel, These are loaded onto GIS based maps for information and in order to identify clashes and opportunities.	N/A	N/A
Growth and Demand Supply	Growth Model	A series of linked processes that underpin the Council's long term planning , by predicting expected development areas, revenues and costs, and estimating income for the long term.	2	2
Hydraulic modelling	Infoworks/ DHI Software	Models have been developed for a number of schemes and catchments. Copies of the models are held on the Council's network drives .	2	4
Maintenance history	Confirm	Contractor work is issued via Confirms Maintenance Management module. History of maintenance is stored against individual assets. Prior to 2007 it was logged at a scheme level.	2	2
Photos	Network drives/ SilentOne	Electronic photos of assets are mainly stored on the Council's network drives . Coastal Structures and Streetlight photos have been uploaded to SilentOne and linked to the assets displayed via Explore Tasman.	N/A	N/A
Processes and documentation	Promapp	Promapp is process management software that provides a central online repository where Council's process diagrams and documentation is stored. It was implemented in 2014 and there is a phased uptake by business units.	2	5
Resource consents and consent compliance	NCS	Detail on Resource Consents and their compliance of conditions (e.g. sample testing) are recorded in the NCS Resource Consents module.	2	2

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
Reports	Confirm Reports	Many SQL based reports from Confirm and a few from RAMM are delivered through Confirm Reports. Explore Tasman also links to this reported information to show asset information and links (to data in SilentOne and NCS).	N/A	N/A
Tenders	LGTenders	Almost all New Zealand councils use this system to advertise their tenders and to conduct the complete tendering process electronically.	N/A	N/A
Operations & Maintenance Information	ActiveManuals™	ActiveManuals™ is a repository of operations and maintenance manuals, manufacturer manuals, technical documents, drawings and photographs. The system enables shared access for Council staff and its partners responsible for operating and maintaining Council assets.	N/A	Ongoing

Table 40: Data Accuracy and Completeness Grades

Grade	Description	% Accurate
1	Accurate	100
2	Minor Inaccuracies	+/- 5
3	50 % Estimated	+/- 20
4	Significant Data Estimated	+/- 30
5	All Data Estimated	+/- 40

Grade	Description	% Complete
1	Complete	100
2	Minor Gaps	90 – 99
3	Major Gaps	60 – 90
4	Significant Gaps	20 – 60
5	Limited Data Available	0 – 20

12.4 Critical Assets

Knowing what's most important is fundamental to managing risk well. By knowing this, Council can invest where it is needed most, and it can tailor this investment at the right level. This will avoid over investing in assets that have little consequence of failure, and will ensure assets that have a high consequence of failure are well managed and maintained. For infrastructure, this is knowing Tasman's critical assets and lifelines. These typically include:

- Water treatment plants
- Trunk mains
- Main pump stations
- Key water reservoirs
- Detention dams

During 2016, Council in partnership with Nelson City Council, the Regional Civil Defence Emergency Management Group and other utility providers, prepared the Nelson Tasman Lifelines Report. This report summarises all lifelines within Nelson and Tasman. Within the report there was a number of actions identified to improve the Region's infrastructure resilience.

Over the next three years, as part of Council’s risk, resilience and recovery planning work, it will focus on the identification, planning and management of its critical assets and lifelines. This will help to ensure that the appropriate level of effort is being made to manage, maintain and renew them, and will extend to ensuring that Council has adequate asset data to enable robust decisions to be made regarding the management of those assets.

12.5 Quality Management

Council has not implemented a formal Quality Management system across the organisation. Quality is ensured by audits, checks and reviews that are managed on a case by case basis. Table 41 outlines the quality management approaches that support Council’s asset management processes and systems.

Table 41: Quality Management Approaches

Activity	Description
Process documentation	Council uses Promapp software to document and store process descriptions. Over time, staff are capturing organisational knowledge in an area accessible to all, to ensure business continuity and consistency. Detailed documentation, forms and templates can be linked to each activity in a process. Processes are shown in flowchart or swim lane format, and can be shared with external parties.
Planning	The Long Term Plan and associated planning process are formalised across Council. There is a LTP project team, LTP governance team, and AMP project team that undertakes internal reviews prior to Council approval stages. Following completion of the AMPs, a peer review is done, and the outcomes used to update the AMP improvement plans.
Programme Delivery	This strictly follows a gateway system with inbuilt checks and balances at every stage. Projects cannot proceed until all criteria of a certain stage have been completely met and formally signed off.
Subdivision Works	Water Supply infrastructure is inspected throughout its installation and pressure tested before Council sign-off and acceptance. Defects and poor workmanship will not be accepted. All work is bonded for a 2-year maintenance period.
Asset Creation	As-built plans are reviewed on receipt for completeness and adherence to the Engineering Standards and Policies. If anomalies are discovered during data entry, these are investigated and corrected. As-built information and accompanying documentation is required to accompany maintenance contract claims.
Asset Data Integrity	Monthly reports are run to ensure data accuracy and completeness. Stormwater, water, wastewater, coastal structures, solid waste and streetlight assets are shown on the corporate GIS browser, Explore Tasman, and viewers are encouraged to report anomalies to the Activity Planning Data Management team.
Operations	Audits of a percentage of contract maintenance works are done every month to ensure that performance standards are maintained. Failure to comply with standards is often linked to financial penalties for the contractor.
Levels of Service	Key performance indicators are reported annually via the Council’s Annual Report. This is audited by the Office of the Auditor General.
Reports to Council	All reports that are presented to Council by staff are reviewed and approved by the Senior Management Team prior to release.

13 Improvement Planning

The activity management plans have been developed as a tool to help Council manage their assets, deliver on the agreed levels of service and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure Council continues to achieve the appropriate level of activity management practice along with delivering services in the most sustainable way while meeting the **community's needs**.

Establishment of a robust, continuous improvement process ensures that Council is making the most effective use of resources to achieve an appropriate level of asset management practice.

13.1 Assessment of our Activity Management Practices

In 2017, Council undertook an assessment of its current asset management practices for the water supply activity. This was a self-assessment with the targets developed in consultation with Waugh Infrastructure Management Ltd to ensure they were appropriate for the activity given:

- Criticality of the Assets;
- Value of the Assets;
- Value spent on maintaining the assets.

The maturity levels were based on the IIMM definitions.

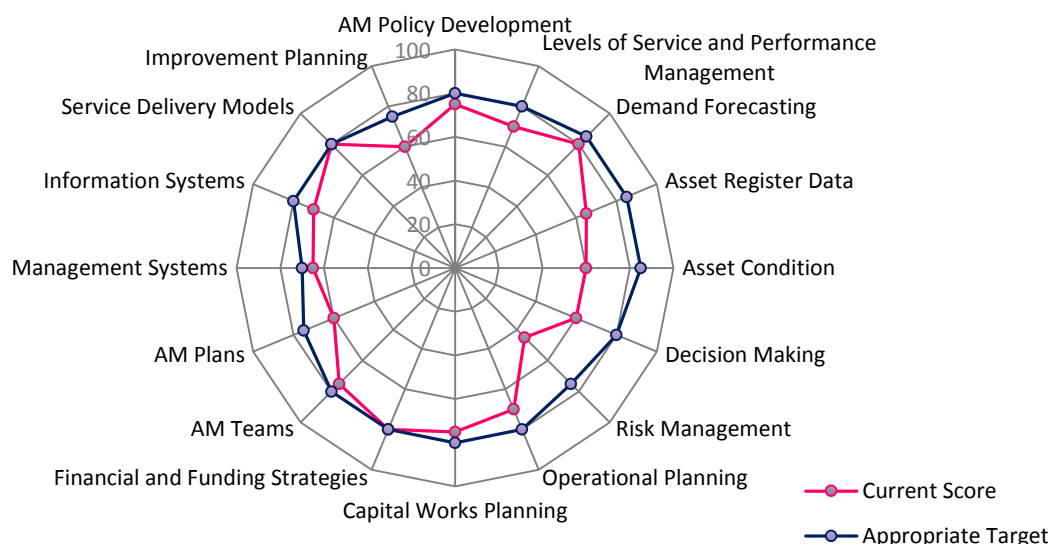


Figure 31: Water Supply Activity Maturity Levels

Figure 31 shows that there are some gaps between where Council's current practice is and where it is desired to be. Focus areas for improvements are Asset Register Data, Asset Condition, Decision Making, and Operational Planning. The actions required to close these gaps have been included in the Improvement Plan.

13.2 Peer Reviews

13.2.1 Waugh Peer Review

In early 2018, Council engaged Waugh Infrastructure Management Ltd to undertake a peer review on the consultation version of this activity management plan. The peer review considered all Engineering Services activities and included the following analysis:

- Overview analysis and consideration of AMP progress completed since the Waugh Infrastructure detailed 2011 AMP Compliance Report (in summary not detail)
- Review of AMPs against general industry practice as observed by Waugh Infrastructure in the past 12 months

- Review and commentary on the adequacy of the AMP structure against current industry practice and requirements, as set out in IIMM 2015, ISO 55000
- Analysis of AMP individual section strengths and emphasis, including analysis of overall AMP ‘message’ verses issues identified
- Overview analysis of AMP status against appropriate asset management practice levels adopted in Council’s Activity Management Policy (summary not detail)
- Analysis of the AMPs against Local Government Act 2002 amendment requirements, both 2012, and 2014 – identification of any issues or ‘misses’
- Provide review comments of AMP strengths and weaknesses identified, with commentary on any suggested priority changes to be completed before LTP 2018

It is important to note that the peer review only considered what was included in the consultation version of this activity management plan. There are aspects of the Council’s asset management processes that are not discussed in this activity management plan and are therefore not incorporated into the scoring.

The overall findings of the Peer Review were that the Council’s AMPs are well developed to support the Council’s Long Term Plan. Some of the AMPs had sections that required completion, but overall missing elements noted were relatively minor.

The AMP template has been updated to incorporate recent Local Government Act changes. The AMP template developed and used by Council has allowed clear, concise presentation of information in a logical manner.

The overall compliance status is shown below in Figure 32.

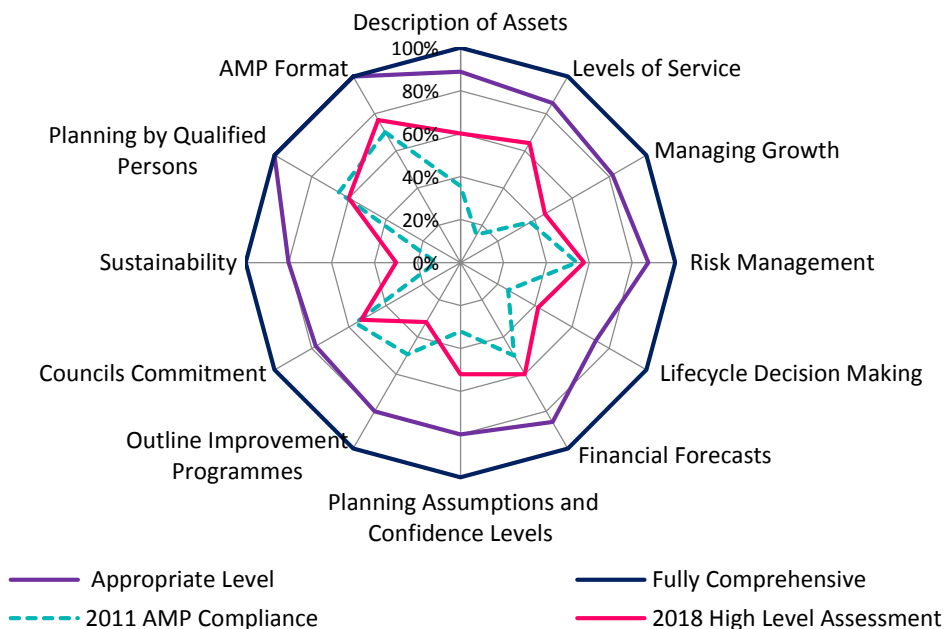


Figure 32: 2018 Peer Review Compliance Status Summary

Council staff have reviewed and prioritised the feedback received in the peer review report. Improvements that could be made immediately have been incorporated into the final version of this activity management plan. Other improvements have been ranked and included in the Improvement Plan.

There has been a minor decrease in scores for Outline Improvement Programmes, Council’s Commitment, and Planning by Qualified Persons. This is not due to a change in Council’s practice or performance, but due to a change in the activity management plan template. After receiving the peer review feedback, additional discussion has been included in Section 12 and Section 13 to address these issues.

13.2.2 Water New Zealand’s National Performance Review

Council voluntarily participate in Water New Zealand’s National Performance Review (NPR). It is an annual benchmarking exercise of the Three Waters (water supply, wastewater and stormwater) service delivery. NPR benchmarks are used to identify potential opportunities to improve service delivery and compare specific performance results against other District, City Council and Council-Controlled Organizations. The report provides decision makers and the public with a transparent picture of Council’s performance within the sector. Council has incorporated guidance from the review in preparation of this AMP.

13.3 Improvement Plan

Establishment of a robust, continuous improvement process ensures that Council is making the most effective use of resources to achieve the appropriate level of asset management practice. The continuous improvement process includes:

- Identification of improvements
- Prioritisation of improvements
- Establishment of an improvement programme
- Delivery of improvements
- On-going review and monitoring of the programme

All improvements identified are included in a single improvement programme encompassing all Engineering Services activities and is managed by the Activity Planning Programme Leader. In this way opportunities to identify and deliver cross-activity or generic improvements can be managed more efficiently, and overall delivery of the improvement programme can be monitored easily.

13.3.1 Summary of Recent Improvements

Based on the peer review by Waugh Infrastructure Management Ltd and internal evaluations and reviews, Council has made improvements to its activity management plan and asset management processes. For the Water Supply activity, areas of strengths include:

- asset descriptions;
- robust demand forecasting;
- summary and discussion of key issues;
- discussion of levels of service and performance analysis;
- well documented assumptions, uncertainties and risks;
- well defined financial forecasting;
- identification of appropriate asset management maturity;
- sustainability is well defined, progressed and audited (including achievement of milestones);
- acknowledgement of NZ Metadata Standard and progress of improving As-built standards.

Since the 2015 AMP review, staff have focused on the following improvements:

- Hydraulic modelling;
- updating water demand management plans;
- inspection of key reservoirs and buildings;
- public information brochure;
- development of system operation plans;
- development of network maps and schematics;
- Improved levels of service and performance measures discussion

Hydraulic Modelling

Hydraulic models for high growth settlements (including Mapua, Motueka, Richmond, and Wakefield) have been updated and recalibrated. Current and future demand scenarios were modelled to determine the impact of development and identify network deficiencies. A master plan report has been prepared for each model and presents possible solutions to address these deficiencies. The outputs of the modelling and reports help inform and plan future capital expenditure.

Water Demand Management Plans

Several Water Demand Management Plans have been updated since 2015. These include Brightwater (2018), Mapua (2018), Motueka (2017), Richmond (2016, Richmond-Waimea (2017), Tapawera (2017) and Wakefield (2018). These plans provide an improvement framework to promote water efficiency that is consistent with best practice in New Zealand.

Structure Inspections

A District wide inspection of all water retaining structures was conducted in 2016 to assess compliance with the current building code. The assessment identified five concrete reservoirs that were likely to perform poorly during a seismic event. A further detailed seismic analysis outlined the appropriate strengthening requirements to make the reservoir code compliant.

Public Information Brochure

A **'Rural Water Supply'** public information brochure has been developed to set out Councils and private landowner responsibilities. The brochure describes and illustrates the typical components of a rural connection and explains the specific requirements for backflow protection and adequate storage. The brochure was sent out to all rural customers and is also available on Council's website.

System Operation Plans

System operation plans (SOP) have been drafted for each water supply scheme and put on a cloud based application that is accessible to **both staff and the maintenance contractor**. **The SOP's are to be reviewed updated and finalised over the next year.**

Maps and Schematics

A series of network schematics have been produced to illustrate the main components of each water supply scheme. These schematics include the source, treatment, storage and reticulation infrastructure. These schematics are mainly for illustrative purposes as they are not spatially accurate. A series of GIS (spatially accurate) maps have also been produced to show the location and distribution extent of each scheme. These maps identify the difference between rural and urban connections. Network schematics are included in Appendix C and network maps are included in Appendix D.

Levels of Service/Performance Measure Discussions

The 2018 AMP has taken more customer-focused approach to levels of service and performance measures with the intention of making them more meaningful and relevant to the wider public. A more in depth analysis and discussion about performance has been presented. This provides more details about how Council intends to meet targets and timeframes.

13.3.2 Summary of Planned Improvements

A list of the Water Supply activity specific improvement items is summarised in Table 42 below.

Table 42: Water Supply Improvement Items

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Improve asset condition data	New operations and maintenance contact set up includes more responsibility to contractor to collect and populate condition data	Some asset condition data is incomplete. Improved understanding of condition data will help Council with the renewals programme.	High	Commences July 2018	Ongoing	Maintenance Contractor & Asset Information Team	Maintenance Contract & Staff time
Improve data, processes and systems	Council is planning to develop as built standards, and asset data and metadata standards	Improved data standards will enhance data reliability and accuracy.	Medium	Started	June 2019	Asset Information Team	Staff time
Refine and improve renewals forecasting	Council is trialing a statistical modelling process with a consultant (Morrison Low) to test the theory of asset design lives and service levels against available data.	Optimise and refine renewals forecasting to enhance long term planning	Medium	Started	June 2019	Activity Planning and Utilities Team Data Analyst	Consultants and staff time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Improve planning around boil water notices	Better planning and preparedness around boil water notices will save time when notifying residents of the need to boil water. Council staff are reviewing the existing planning mechanisms and intend to improve our processes and document these in an emergency operation file.	The Havelock North Inquiry identified the need for planning improvements around boil water notices.	High	Started	2018/19	Engineering Services – Utilities and Activity Planning Team	Staff time
Provide a snapshot of water supply network pipe size and material distribution	Extract data from asset management system to further illustrate the nature of the reticulated pipe network	Adding these details to AMP will further enhance reader understanding	Low	Not started	2021 AMP	Engineering Services – Data Analyst	Staff time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Develop contingency plans and emergency response plans	<p>An outcome of the Water Supply Bylaw changes may be a district wide water shortage plan.</p> <p>A water supply contamination exercise is planned for 2018, and the outcome may result in an updated water contamination emergency response plan.</p>	Improved readiness for and response to an emergency	High	Not started	2021	Activity Planning and Utilities Team	Staff time

A list of general across activity improvement items is provided in Table 43 below

Table 43: General Activity Management Improvement Items

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Create Critical Asset Framework	Describe in AMP how it is used to prioritise asset information and condition assessments, adjust economic lives (renewal profiles) prioritise renewals and expenditure, operation and maintenance	Only the initial assessment has been undertaken, the framework was never re-tested.	High	In Progress	June 2020	Activity Planning	Staff Time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Provide data confidence ratings for groups of assets within the valuation for each activity.		In the valuation reports data confidence is only assessed across the activity and not for the different types of asset groups. It is likely that data confidence varies considerably between buried assets and above ground assets and this is not reflected in the reports.	Medium	Not started	June 2020	Utilities- Data Analyst	Consultants and staff time Budget \$33,500 in 2019/20
Consider how levels of service options are presented to the community	Consider how to better engage the community in agreeing appropriate levels of service through specific work streams (e.g. Risk, Resilience, Recovery).	Engagement is required to determine an appropriate level of service	Medium	Not started	2021	Activity Planning	Staff Time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Capture and track maintenance data	Historical costs should be analysed to calculate forward budgets	Improve the consistency and confidence when planning operations and maintenance budgets	Medium	Not started	Ongoing	Activity Planning and Utilities Data Analyst	Staff Time

14 List of Appendices

Table 44: Summary of appendices

Number	Appendix Title
A	Detailed Operating Budgets
B	Detailed Capital Budgets
C	Water Supply Scheme Schematics
D	Water Supply Maps

Appendix A: Detailed Operating Budgets

Appendix B: Detailed Capital Budgets

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget (\$)										Total Budget	
			Growth	InclOS	Renewals		2018-19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028-38	2038-48
86001	88 Valley Reticulation Renewal Programme	Renewal of reticulation within the 88 Valley scheme	0	0	100	550,000	0	50,000	0	50,000	0	50,000	0	50,000	0	50,000	150,000	150,000
86002	88 Valley Reservoir Component Renewal	Renewal of electrical and flowmeter components	0	0	100	16,500	0	0	16,500	0	0	0	0	0	0	0	0	0
86003	88 Valley WTP & Pump Station Renewal	Relocate chlorine out of building, new generator to run pump in power outages, replace pipework and install chlorine scales.	0	100	0	31,000	0	0	6,000	0	25,000	0	0	0	0	0	0	0
86004	88 Valley Retic & Resv - Intake Access & Pipeline Renewal	Intake access and pipeline renewal	0	100	0	34,900	34,900	0	0	0	0	0	0	0	0	0	0	0
86005	88 Valley WTP & Pump Stations - Treatment Upgrades	New WTP for 88 Valley Scheme (pending community consultation)	0	100	0	1,820,500	0	0	0	200,000	1,620,500	0	0	0	0	0	0	0
86006	Brightwater Reticulation - Factory Road Main Renewal	Renewal of 660m of 100mm AC main with 150mm PVC from SH6 to River Terrace Road	0	4	96	393,600	0	0	0	0	0	0	0	0	45,000	348,600	0	0
86007	Redwood Reticulation & Reservoirs - Replace Laings Reservoir	Replace existing reservoir with twin 30,000L plastic tanks	0	0	100	126,200	0	126,200	0	0	0	0	0	0	0	0	0	0
86008	Brightwater Reticulation - SH6 Main Renewal	Renewal of 1525m of 150mm AC main with 200mm pvc from Ranzau Road to 3 Brothers Corner	0	11	89	1,928,600	0	0	0	0	0	0	0	0	50,000	1,878,600	0	0
86009	Brightwater WTP Upgrade	Upgrade WTP to meet DWSNZ with filtration to lower turbidity	30	70	0	1,458,300	0	65,000	1,393,300	0	0	0	0	0	0	0	0	0
86010	Collingwood WTP - Component Renewals	Replace limestone in saturator and cleaning aerator, improve chlorine H&S, install HVAC & new flowmeter and scour point, replace old pipework	0	0	100	48,000	13,000	20,000	15,000	0	0	0	0	0	0	0	0	0
86011	Brightwater Source - New Bores	Relocate and construct new bores away from the river on natural ground	0	100	0	643,900	0	0	0	0	10,000	55,000	40,000	538,900	0	0	0	0
86012	Collingwood WTP - Treatment Upgrade	Upgrade WTP to meet DWSNZ with filtration to lower turbidity	0	100	0	1,064,500	160,000	40,000	864,500	0	0	0	0	0	0	0	0	0
86013	Dovedale Retic - Break Pressure Tank & Reservoir Renewal	Replacing break pressure tank and reservoirs	0	0	100	105,300	11,700	0	11,700	0	11,700	0	11,700	0	11,700	0	46,800	0
86014	Richmond Reticulation - Roeske Street Pipeline Renewal	Replacement of AC pipe including new rider main	0	0	100	492,400	0	0	0	0	0	0	0	20,000	472,400	0	0	0
86015	Richmond Reticulation - Wilkes Street Pipeline Renewal	Replacement of AC pipe including rider main	0	0	100	500,600	0	0	0	0	0	0	0	20,000	480,600	0	0	0
86016	Dovedale Reticulation Renewal Programme	Renewal of reticulation within the Dovedale scheme	0	0	100	2,750,000	200,000	100,000	100,000	100,000	100,000	100,000	150,000	150,000	150,000	100,000	1,000,000	500,000
86017	Richmond Reticulation - George Street Pipeline Renewal	Replacement of ductile iron pipe	0	0	100	509,200	0	0	0	0	0	0	0	20,000	489,200	0	0	0
86018	Dovedale Source - New Motueka River Valley Water Source	New bore, treatment, headworks, pump station, treatment plant, delivery pipework	0	100	0	3,155,200	40,000	0	0	0	80,000	1,110,000	1,925,200	0	0	0	0	0
86019	Growth Allowance (11 to 20 yr)	Contribution for new water infrastructure associated with development	100	0	0	500,000	0	0	0	0	0	0	0	0	0	0	500,000	0
86020	Dovedale WTP & PS - Humphries Creek Treatment Renewals	Improve chlorine dosing chamber and install pumps	0	0	100	120,000	50,000	20,000	50,000	0	0	0	0	0	0	0	0	0
86021	Hamama Reticulation - Reservoir Renewal	Renewal of strainer and settlement tank	0	0	100	28,000	0	0	0	0	0	0	0	0	0	0	28,000	0
86022	Hamama Treatment - Install Household Treatment Units	Install household treatment units in each house on scheme	0	100	0	192,500	0	0	0	0	0	0	0	0	0	0	192,500	0
86023	Hamama Reticulation - Pipe Renewals	Pipeline renewals programme	0	0	100	562,200	0	0	0	0	0	0	0	0	0	0	562,200	0
86024	Hamama Reticulation - Valve Renewals	Valve renewals	0	0	100	11,400	0	0	0	0	0	0	0	0	0	0	11,400	0
86025	Wai-iti Dam Renewal - Rock Armour Layer on Upstream Face	Design and install rock armour layer on upstream face down to RL 265m to protect upstream face against wave erosion	0	100	0	80,900	80,900	0	0	0	0	0	0	0	0	0	0	0
86026	Mapua Retic - Aranui Rd & Stafford Dr Main Replacement	Replace 970m of 150mm pipe and 2530m of 200mm pipe	16	38	46	2,437,800	2,437,800	0	0	0	0	0	0	0	0	0	0	0

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget (\$)										Total Budget		
			Growth	InclOS	Renewals		2018-48	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028-38	2038-48
86027	Mapua Reticulation - Channel Crossing	Construct additional water pipeline across the Mapua estuary	14	86	0	754,300	0	0	0	0	0	0	0	0	0	35,000	719,300	0	
86028	Richmond Source - Waimea Bore Pump Upgrade	Upgrade of Waimea Bores (5-9) and the associated pipework to Waimea WTP	29	71	0	1,362,300	130,000	1,232,300	0	0	0	0	0	0	0	0	0	0	0
86029	Murchison WTP & PS - Building Renewals	Renewal of aeration tower, chlorinator & contact tank	0	10	90	120,000	0	0	0	20,000	100,000	0	0	0	0	0	0	0	0
86030	WTP & Reservoir Internal Pipe Upgrades	Replace corroded fittings and pipes inside contact tanks and reservoirs with non corroding equipment	0	0	100	179,500	0	0	0	0	0	0	80,000	99,500	0	0	0	0	0
86031	Pohara WTP & PS - Treatment Upgrades	New membrane treatment plant added on to existing site to meet DWSNZ	0	100	0	409,800	0	40,000	369,800	0	0	0	0	0	0	0	0	0	0
86032	Richmond Reticulation - Waimea WTP Upgrade	Replace tank, strengthen existing building and upgrade to DWSNZ for Mapua	29	71	0	1,742,800	65,000	65,000	1,612,800	0	0	0	0	0	0	0	0	0	0
86033	Murchison WTP & PS - Treatment Renewals	Treatment upgrade of parts including electrical, UV, filters, UVT meter & valves to improve DWSNZ and resilience	0	0	100	220,000	0	0	0	20,000	200,000	0	0	0	0	0	0	0	0
86034	Wai-iti Dam - Closing Outlet Conduit	Design & install a closing mechanism at the outlet conduit to allow for CCTV access, inspections or emergencies	0	100	0	96,600	15,000	81,600	0	0	0	0	0	0	0	0	0	0	0
86035	Growth Allowance (21 to 30 yr)	Contribution for new water infrastructure associated with development	100	0	0	500,000	0	0	0	0	0	0	0	0	0	0	0	0	500,000
86036	Wakefield Reticulation Upgrades	Treeton Place pump station and reservoir upgrades with addition of telemetry	0	100	0	70,000	0	0	0	0	0	0	70,000	0	0	0	0	0	0
86037	Redwood Valley WTP & PS - Treatment Upgrades Golden Hills	Replace all old components at site and building to meet DWSNZ	0	60	40	678,800	0	0	25,000	653,800	0	0	0	0	0	0	0	0	0
86038	Redwood Reticulation Renewal Programme	Renewal of reticulation within the Redwoods scheme	0	0	100	1,350,000	50,000	50,000	50,000	50,000	50,000	50,000	100,000	100,000	100,000	100,000	500,000	150,000	0
86039	Redwood Valley WTP & PS - O'Connor's Creek Treatment Upgrade	Upgrade to meet DWSNZ	0	60	40	656,400	0	0	25,000	631,400	0	0	0	0	0	0	0	0	0
86040	Wakefield New Water Treatment Plant	New treatment plant in Spring Grove, piped to Wakefield to meet DWSNZ	31	69	0	6,300,000	3,300,000	3,000,000	0	0	0	0	0	0	0	0	0	0	0
86041	Growth Allowance - 11 to 20 yr	Contribution for new water infrastructure associated with development	100	0	0	100,000	0	0	0	0	0	0	0	0	0	0	0	100,000	0
86042	Wakefield Reticulation - Arrow Street Renewals	Renewal of AC pipe in Arrow St and new connection to Martin Avenue	0	0	100	1,078,900	77,000	745,000	256,900	0	0	0	0	0	0	0	0	0	0
86043	Growth Allowance - 21 to 30 yr	Contribution for new water infrastructure associated with development	100	0	0	100,000	0	0	0	0	0	0	0	0	0	0	0	0	100,000
86044	Richmond Source - New Inland Bores (Clover Road)	New bores at Clover West Road for long term resilience	28	72	0	7,683,100	0	0	0	0	0	0	0	0	0	0	0	0	7,683,100
86045	Richmond Reticulation - Oxford Street Main Renewal	Renewal of existing 100mm pipe with new PE PN12 150mm pipe	0	44	56	797,900	50,000	0	0	747,900	0	0	0	0	0	0	0	0	0
86046	Motueka Reticulation - Pipe Link from WTP to network	New pipes linking Parker St WTP to reticulation network	32	68	0	242,100	0	242,100	0	0	0	0	0	0	0	0	0	0	0
86047	Richmond WTP - Capacity Upgrade	Increase capacity of current WTP including new plant pipe work, pressure cylinder & controls.	73	27	0	201,200	0	110,000	91,200	0	0	0	0	0	0	0	0	0	0
86048	Richmond Source - Relocation of Bores (Richmond West)	Relocation of bores 400m inland to improve security and resilience	0	100	0	1,864,800	0	0	0	50,000	150,000	0	250,000	1,414,800	0	0	0	0	0
86049	Backflow Prevention Programme	Installation of backflow preventions at key sites	0	100	0	350,000	100,000	50,000	50,000	50,000	50,000	50,000	0	0	0	0	0	0	0
86050	Richmond Reticulation - Edward Street Pipe Renewal	Replacement of ductile iron pipe on Edward Street	0	0	100	497,700	0	0	0	0	0	0	0	20,000	477,700	0	0	0	0
86051	Richmond Reticulation - Lower Queen Street Trunkmain Upgrade	Upgrade trunk main capacity from AC 350mm to 400mm PVC or PE.	13	32	55	1,563,100	0	0	0	0	0	0	30,000	75,000	1,458,100	0	0	0	0
86053	Richmond Reticulation - Queen St / Salisbury Rd Intersection	Renewal of pipes and an opportunity to move assets out of the intersection	0	0	100	192,600	0	0	0	0	0	0	14,800	177,800	0	0	0	0	0
86054	Richmond Reticulation - Waverley Street Main Replacement	Replace existing 100mm pipe with 150mm between Wensley Road and Gladstone Road	0	50	50	662,600	0	0	0	0	0	0	662,600	0	0	0	0	0	0

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget (\$)										Total Budget	
			Growth	InclOS	Renewals		2018-19	2019-20	2020-21	2021-22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028-38	2038-48
86055	Kaiteriteri Pipeline Replacement	Renewal of 150mm PVC pipe	0	0	100	254,600	0	0	0	254,600	0	0	0	0	0	0	0	0
86056	Richmond South Reticulation - Low Level Reservoir Stage 2	Staged development of a third concrete tank to provide storage for Richmond West development and low level areas of Richmond South	100	0	0	1,172,100	0	0	0	0	0	0	0	0	0	0	0	1,172,100
86057	Richmond Reticulation - Salisbury Road Pipeline Upgrade	Upgrade existing 150mm pipeline to 200mm pipe	0	0	100	1,504,700	0	0	150,000	1,354,700	0	0	0	0	0	0	0	0
86058	Wakefield Reticulation - Whitby Road & Whitby Way Renewals	Replace existing AC pipes	0	100	0	1,204,600	0	0	0	90,000	1,114,600	0	0	0	0	0	0	0
86059	Tapawera WTP Upgrades	Install two new exterior bores, construct new building with addition of filtration, UV & electrical upgrades. Reuse of existing pH & Chlorination equipment to improve DWSNZ and resilience	0	78	22	755,200	0	0	0	0	0	45,000	710,200	0	0	0	0	0
86060	Maisey Road Reservoir Upgrades	Replace existing concrete tanks with new plastic tanks	0	0	100	174,000	0	0	0	0	0	0	174,000	0	0	0	0	0
86061	Motueka Reticulation - Fearon Street Main Renewal	Main needs to be lowered, currently has 480mm cover and suffers from bursts	0	0	100	721,300	0	0	0	0	0	0	60,000	661,300	0	0	0	0
86062	Motueka Reticulation - High Street Main Renewal	Replace Class B 200mm main along High St from Old Wharf Road to Wharf Road roundabout	0	0	100	1,429,800	0	0	0	0	0	0	95,000	1,334,800	0	0	0	0
86063	Motueka Reticulation - New Town Supply	New town supply for Motueka	0	100	0	15,248,600	0	0	0	0	0	0	0	0	0	0	0	15,248,600
86064	Motueka WTP (Parker Street)	New water treatment plant at Parker Street to meet DWSNZ	32	68	0	1,826,000	935,000	891,000	0	0	0	0	0	0	0	0	0	0
86067	Motueka Reticulation Renewal Programme	Renewal of reticulation within the Motueka scheme	0	0	100	555,000	0	0	0	0	0	0	0	0	0	0	0	55,000
86069	Motueka Reticulation - Thorp Street Water Main Renewal	Direct replacement for 200mm main with uPVC	0	0	100	1,733,600	0	105,000	1,628,600	0	0	0	0	0	0	0	0	0
86071	Occupational Health & Safety	Misc health and safety improvements such as anchor points, railings and chlorine safety	0	100	0	660,000	50,000	50,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000
86072	Richmond South Reticulation - Low Level Water Main	New 350mm trunk main from Richmond WTP to Low Level Reservoir	73	27	0	1,985,000	500,000	410,000	245,000	830,000	0	0	0	0	0	0	0	0
86073	Urban Water Club - Telemetry Upgrade	Scada/Telemetry software upgrades every 5 years	0	100	0	75,000	0	0	0	0	15,000	0	0	0	0	15,000	30,000	15,000
86074	Motueka Telemetry Upgrade	Scada/telemetry software upgrades every 5 years	0	100	0	20,000	0	0	0	0	4,000	0	0	0	0	4,000	8,000	4,000
86075	88 Valley Telemetry Upgrade	Scada/telemetry software upgrades every 5 years	0	100	0	10,000	0	0	0	0	2,000	0	0	0	0	2,000	4,000	2,000
86076	Dovedale Telemetry Upgrade	Scada/telemetry software upgrades every 5 years	0	100	0	10,000	0	0	0	0	2,000	0	0	0	0	2,000	4,000	2,000
86077	Redwood Telemetry Upgrade	Scada/Telemetry software upgrades every 5 years	0	100	0	10,000	0	0	0	0	2,000	0	0	0	0	2,000	4,000	2,000
86078	Urban Water Club - Telemetry Renewal	Renewal of telemetry within the Urban Club schemes	0	0	100	1,850,000	50,000	75,000	50,000	75,000	50,000	75,000	50,000	75,000	50,000	75,000	600,000	625,000
86079	Motueka Telemetry Renewal	Renewal of telemetry within the Motueka scheme	0	0	100	100,000	0	0	0	0	25,000	0	0	0	0	0	50,000	25,000
86080	88 Valley Telemetry Renewal	Renewal of telemetry within the 88 Valley scheme	0	0	100	100,000	0	0	0	0	0	0	0	0	0	50,000	0	50,000
86081	Dovedale Telemetry Renewal	Renewal of telemetry within the Dovedale scheme	0	0	100	450,000	50,000	0	0	50,000	0	0	50,000	0	0	25,000	150,000	125,000
86082	Redwood Telemetry Renewal	Renewal of telemetry within the Redwoods scheme	0	0	100	300,000	25,000	25,000	0	25,000	0	0	25,000	25,000	25,000	0	75,000	75,000
86085	Tapawera Reservoir - Clean, Seal & Paint	Carry out repairs to existing reservoir roof: clean, seal cracks and paint	0	0	100	68,800	0	68,800	0	0	0	0	0	0	0	0	0	0
86086	Upper Takaka Reticulation - Replace Existing Pipework	Install simplified pipework arrangement which no longer goes under houses	0	0	100	340,800	0	0	0	0	0	0	0	340,800	0	0	0	0
86087	Upper Takaka Treatment - New Reservoirs	2x new reservoirs 30,000L with retaining wall and stock fencing	0	0	100	96,800	0	96,800	0	0	0	0	0	0	0	0	0	0
86088	Wakefield WTP - Decommission Old WTP	Decommission old well, bore and WTP and remove from site completely	31	69	0	98,000	0	0	0	0	0	0	98,000	0	0	0	0	0
86089	Wakefield Reservoir Renewal	Clean, seal and paint roof on Wakefield reservoir.	0	0	100	78,000	0	0	78,000	0	0	0	0	0	0	0	0	0

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget (\$)										Total Budget	
			Growth	IncLOS	Renewals		2018-19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028-38	2038-48
86090	Urban Water Club Scheme Monitoring Equipment	Routine replacement of monitoring equipment	0	0	100	455,000	90,000	100,000	65,000	40,000	20,000	20,000	40,000	20,000	40,000	20,000	0	0
86091	Motueka Monitoring Equipment	Renewal of monitoring equipment in Motueka Scheme	0	0	100	45,000	0	35,000	0	0	0	10,000	0	0	0	0	0	0
86092	88 Valley Monitoring Equipment	Depolox unit and turbidity meter need replacing	0	0	100	35,000	35,000	0	0	0	0	0	0	0	0	0	0	0
86093	Dovedale Monitoring Equipment	2 deplox units need replacing and turbidity unit old and no longer supported by 2022	0	0	100	35,000	15,000	20,000	0	0	0	0	0	0	0	0	0	0
86094	Urban Water Club Reticulation - Valve Renewal	Renewal of valves within the Urban Water Club schemes	0	0	100	900,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	300,000	300,000
86095	Redwood Monitoring Equipment	Replace monitoring equipment before it fails and parts are no longer available	0	0	100	105,000	20,000	85,000	0	0	0	0	0	0	0	0	0	0
86096	Urban Water Club Reticulation - Hydrant Renewal	Renewal of hydrants within the Urban Water Club schemes	0	0	100	750,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	250,000	250,000
86097	Urban Water Club Reticulation - Meter Renewal	Renewal of water meters within the Urban Water Club schemes	0	0	100	1,568,100	0	0	420,500	0	0	0	0	0	30,500	0	939,800	177,300
86098	Urban Water Club Reticulation - Pump & VSD Renewals	Renewal of pumps and variable speed drives within the Urban Water Club	0	0	100	3,210,000	107,000	107,000	107,000	107,000	107,000	107,000	107,000	107,000	107,000	107,000	1,070,000	1,070,000
86099	Motueka Retic - Flowmeters, Hydrants, Pumps, VSD & Valves	Renewal of flowmeters, hydrants, pumps, variable speed drives, & valve in the Motueka Scheme	0	0	100	1,728,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	764,000	764,000
86100	88 Valley Flowmeters, Hydrants, Pumps, VSD & Valves Renewals	Renewal of Flowmeters, Hydrants, Pumps, VSD & Valves in 88 Valley Scheme	0	0	100	85,000	1,500	1,500	1,500	1,500	1,500	11,500	1,500	1,500	11,500	1,500	15,000	35,000
86101	Dovedale Retic - Flowmeters, Hydrants, Pumps, VSD & Valves	Renewal of meters, hydrants, pumps, VSD and valves within the Dovedale scheme	0	0	100	550,000	30,000	30,000	30,000	30,000	30,000	16,000	16,000	16,000	16,000	16,000	160,000	160,000
86102	Kaiteriteri Reticulation - Reservoir Improvements	Existing reservoir roof and liners require upgrading	0	100	0	90,800	0	0	0	0	90,800	0	0	0	0	0	0	0
86103	Redwood Retic - Flowmeters, Hydrants, Pumps & Valves	Renewal of meters, hydrants, pumps, VSD and valves within the Redwoods scheme	0	0	100	437,500	25,000	25,000	25,000	25,000	25,000	12,500	12,500	12,500	12,500	12,500	125,000	125,000
86104	Kaiteriteri Source - Bore Upgrade	Existing bore needs to be raised or drill new bore	0	100	0	90,000	90,000	0	0	0	0	0	0	0	0	0	0	0
86105	Kaiteriteri Reticulation - Pipe Work Upgrade	Connect Booster 1 to new mains route	0	100	0	36,000	0	36,000	0	0	0	0	0	0	0	0	0	0
86106	Brightwater Reservoir Renewal	Reservoir roof requires sealing and painting	0	0	100	78,400	0	0	78,400	0	0	0	0	0	0	0	0	0
86107	Brightwater Reticulation - Teapot Valley Pump Station Upgrades	New telemetry and tanks	0	0	100	63,600	0	0	0	0	0	0	0	0	63,600	0	0	0
86108	Pohara Reticulation - Centralise Reservoirs	3 new tanks at Haile Lane and re use 3 Falconer Rd tanks at Haile Lane	0	100	0	150,700	0	0	10,000	140,700	0	0	0	0	0	0	0	0
86109	Redwood Retic - Break Pressure Tank & Reservoir Renewal	Remove old concrete tank and install 30,000L plastic tank	0	0	100	12,000	0	0	0	0	12,000	0	0	0	0	0	0	0
86111	Urban Water Club Reticulation - Renewal	Renewal of reticulation within the Urban Water Club schemes	0	0	100	27,950,000	200,000	200,000	200,000	200,000	200,000	745,000	745,000	745,000	745,000	745,000	21,075,000	2,150,000
86112	Richmond Reticulation - Gladstone Rd Upgrade	New 250mm main from Queen St to Three Brothers Roundabout	28	72	0	2,417,600	0	0	0	0	0	150,000	1,000,000	1,267,600	0	0	0	
86113	Richmond South Reticulation - High Level Water Main	New rising main and pump station from Low Level Reservoir to High Level Reservoir	100	0	0	1,373,900	0	0	0	0	0	0	0	0	0	0	0	1,373,900
86114	Marahau Reticulation - New Town Supply	Allowance for possible future water supply in Marahau	0	100	0	2,346,800	0	0	0	0	0	0	0	0	0	0	0	2,346,800
86115	Richmond South Reticulation - Heights Water Main	New rising main and pump station from High Level Reservoir to Heights Reservoir	0	100	0	105,633	0	0	0	0	0	0	0	0	0	0	0	105,633
86116	Richmond South Reticulation - High Level Reservoir Link	Upsize of 50mm to 150mm along Hill Street between Hart Rd and White Rd	100	0	0	731,700	0	0	0	0	0	0	0	0	0	0	0	731,700
86118	Richmond South Reticulation - Bateup Rd/White Rd Connection	250mm pipe between connect Bateup Road and White Road	81	19	0	584,000	0	0	0	0	0	0	0	0	0	0	584,000	0
86119	Richmond South Reticulation - Heights Reservoir	New reservoir and connecting pipe to High Level Reservoir	0	100	0	310,200	0	0	0	0	0	0	0	0	0	0	0	310,200

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget (\$)										Total Budget	
			Growth	InclOS	Renewals	2018-48	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028-38	2038-48
86120	Richmond South Reticulation - High Level Reservoir	New storage reservoir for high level zone and decommission (& re-use) Arizona Tank	100	0	0	2,262,000	0	0	0	0	0	0	0	0	0	0	0	2,262,000
86121	Richmond South Reticulation - Low Level Reservoir Stage 1	Development of two concrete tanks to provide storage for Richmond West development and low level areas of Richmond South	72	28	0	4,210,000	700,000	0	110,000	3,400,000	0	0	0	0	0	0	0	0
86122	Motueka Retic - Zone of Effect around Parker Street WTP	Install new reticulation to address resource consent condition associated with 'Zone of Effect' around Parker St	0	100	0	2,707,400	400,000	2,307,400	0	0	0	0	0	0	0	0	0	0
86128	Richmond Reticulation - Nelson Pine Water Main Relocation	New rising main from Richmond WTP along Headingly Lane to connect into the Champion Road rising main	0	100	0	1,154,600	1,154,600	0	0	0	0	0	0	0	0	0	0	0
86129	Richmond Oxford / Gladstone Intersection Upgrade	Renewal of Oxford St pipeline will require a connection upgrade.	0	0	100	115,900	0	0	0	115,900	0	0	0	0	0	0	0	0
86131	Wakefield Reticulation - Upsize of Bird Lane water pipe	Upsize the existing 40/50mm line to a 150mm pipe to service residential growth in DA11	67	33	0	132,100	5,000	127,100	0	0	0	0	0	0	0	0	0	0
86132	Motueka Retic - Decommission Fearons Bush Pump Station	Decommission pump station following a suitable operational period at Parker St WTP	32	68	0	90,800	0	0	0	0	0	90,800	0	0	0	0	0	0
86133	Motueka Treatment - Recreation Centre Facility Upgrade	Upgrade existing facility to meet DWSNZ	0	100	0	837,600	30,000	60,000	747,600	0	0	0	0	0	0	0	0	0
86134	Motueka Retic - Connectivity & Resilience Improvements	Internal connections within existing network to maintain resilience	0	100	0	1,715,900	0	0	0	0	0	0	50,000	200,000	1,465,900	0	0	0
86135	Motueka Reticulation - Motueka West Water Main Stage 1	Installation of 250mm pipe along Grey St to service Motueka West	86	14	0	958,000	0	60,000	898,000	0	0	0	0	0	0	0	0	0
86136	Motueka Reticulation - Motueka West Water Main Stage 2	Reticulation from Grey Street to King Edward Street	86	14	0	831,400	0	0	0	0	0	0	0	0	0	0	831,400	0
86137	Mapua Reticulation - Pomona Road Reservoir Upgrade	Increase storage capacity: replace existing wooden reservoir with concrete and upsize to 1500m³	29	71	0	1,684,100	0	0	70,000	1,614,100	0	0	0	0	0	0	0	0
86139	Mapua Reticulation - Stage Coach Road Reservoir Upgrade	Abandon existing three storage tanks and replace with a 6 x 30m plastic tanks	26	74	0	612,600	0	0	0	75,000	537,600	0	0	0	0	0	0	0
86140	Mapua Reticulation - Trunk Main Renewal	Replace 850m of 200mm PVC, re-line 875m between Rabbit & Best Island and replace section between Rabbit Island & Mapua Wharf	15	36	49	3,017,500	0	250,000	2,767,500	0	0	0	0	0	0	0	0	0
86141	Richmond Reticulation - Richmond West Loop Main	New 200mm loop main to service Richmond West North of Borck Creek	80	20	0	1,310,800	0	0	0	0	0	0	0	0	0	0	1,310,800	0
86142	Redwood Reticulation - Pipe Re-location	Relocation due to farming/forestry operations or development	0	0	100	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
86143	88 Valley Pipe Re-location	Relocation due to farming/forestry operations or development	0	0	100	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
86144	Dovedale Reticulation - Pipe Re-location	Relocation due to farming/forestry operations or development	0	0	100	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
86145	Urban Water Club Infonet Software Licensing	Annual support costs for Infonet software	0	100	0	203,900	15,400	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	65,000	65,000
89001	Waimea Dam Share Purchase Annual	Council Share of Waimea Dam Capital Costs	21	79	0	-15,500,000	-15,500,000	0	0	0	0	0	0	0	0	0	0	0
89001	Waimea Dam Share Purchase Annual	Council's Share of Waimea Dam Capital Costs	8	92	0	24,644,836	24,644,836	0	0	0	0	0	0	0	0	0	0	0
	Capital Programme Scope Risk Adjustment	Capital Programme Scope Risk Adjustment	0	100	0	-7,546,497	-566,895	-580,885	-636,815	-555,905	-237,610	-128,675	-293,790	-359,570	-318,495	-167,150	-1,784,045	-1,916,662

Appendix C: Water Supply Network Schematics

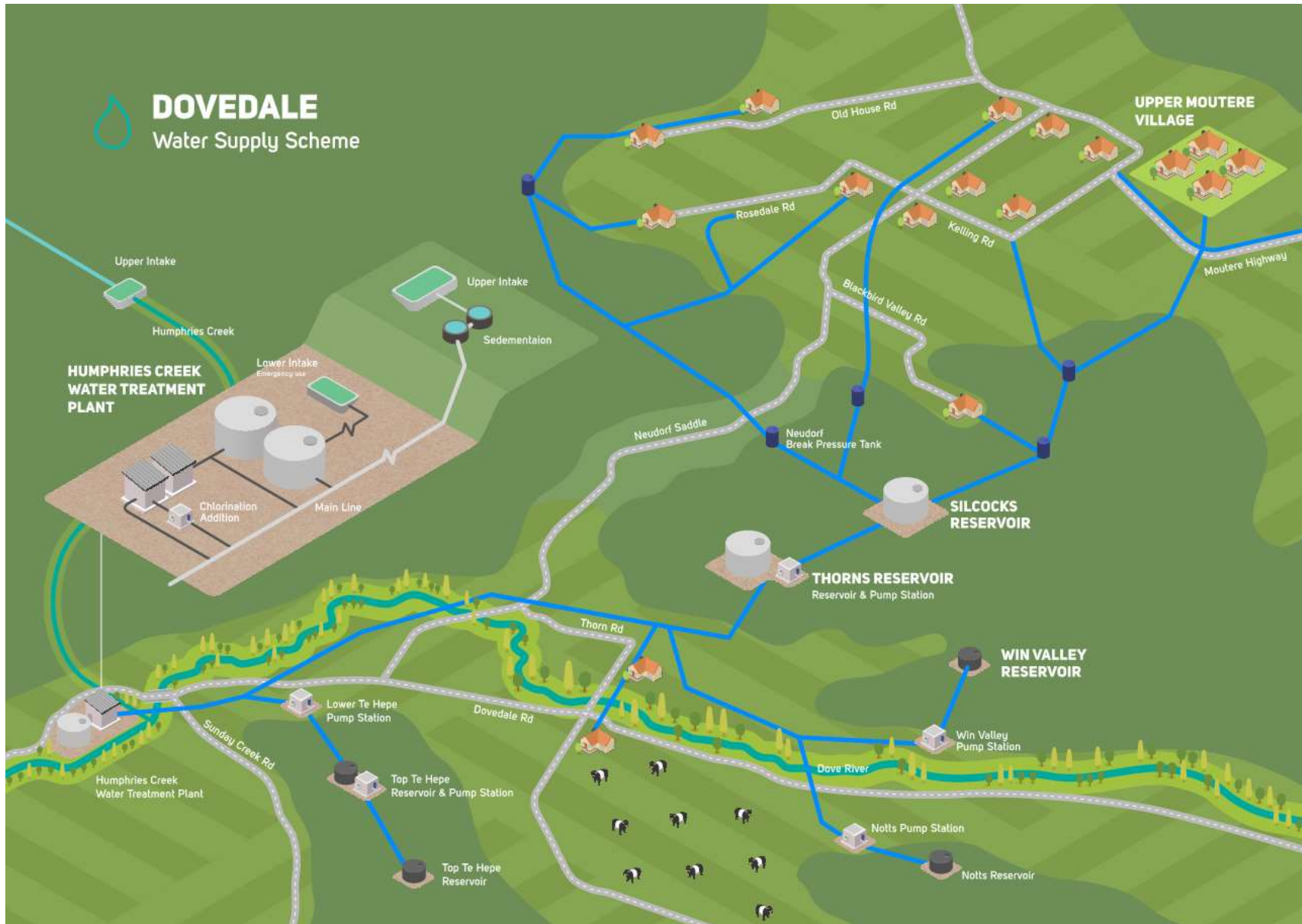
A network schematic has been produced for the following water supply schemes:

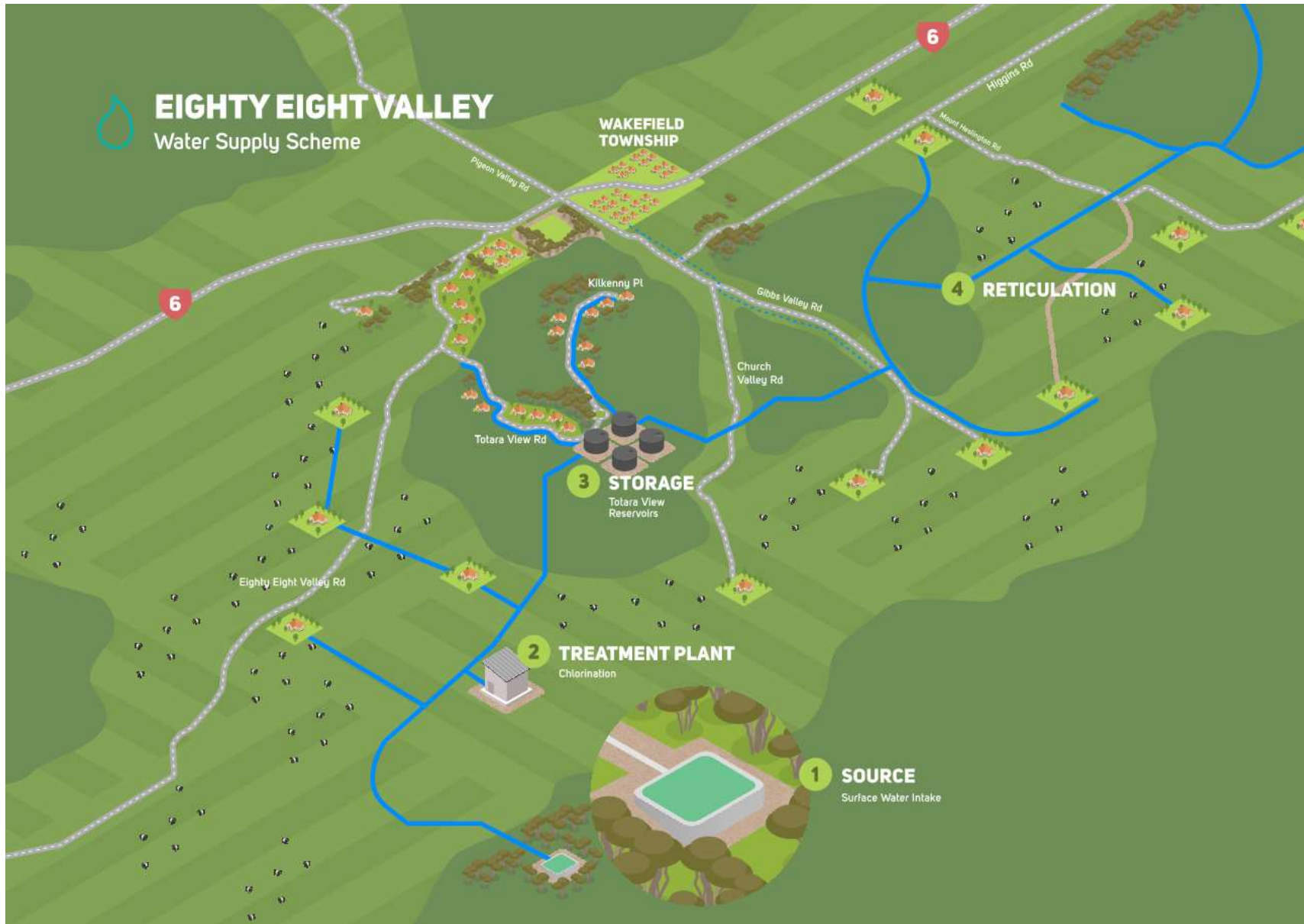
- Brightwater/Hope
- Collingwood
- Dovedale
- Eighty-Eight valley
- Kaiteriteri/Riwaka
- Mapua Rise
- Mapua/Ruby Bay
- Motueka
- Murchison
- Pohara
- Redwoods 1 & 2
- Richmond
- Tapawera
- Upper Takaka
- Wakefield

Network schematics were not produced for Takaka and Hamama

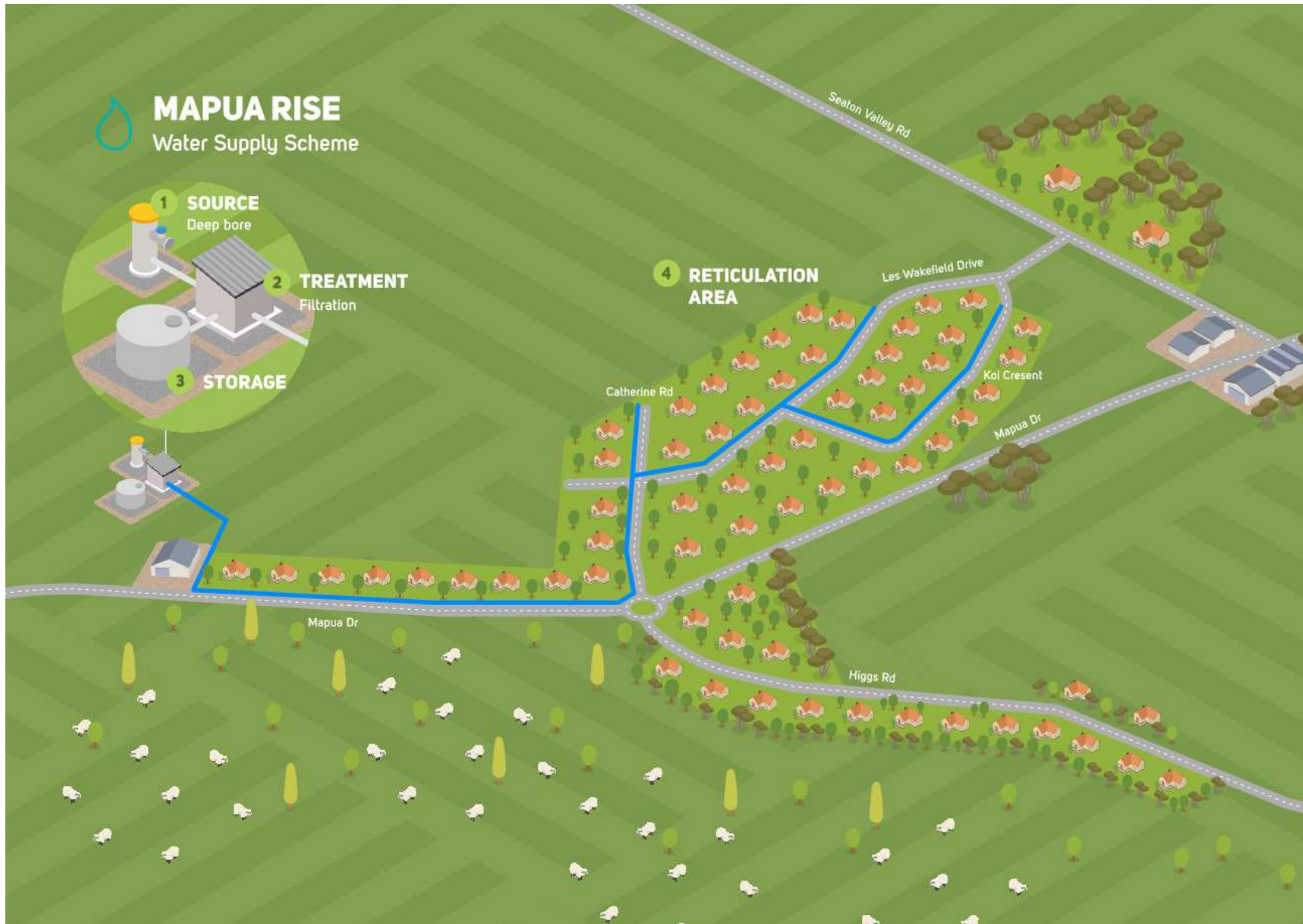






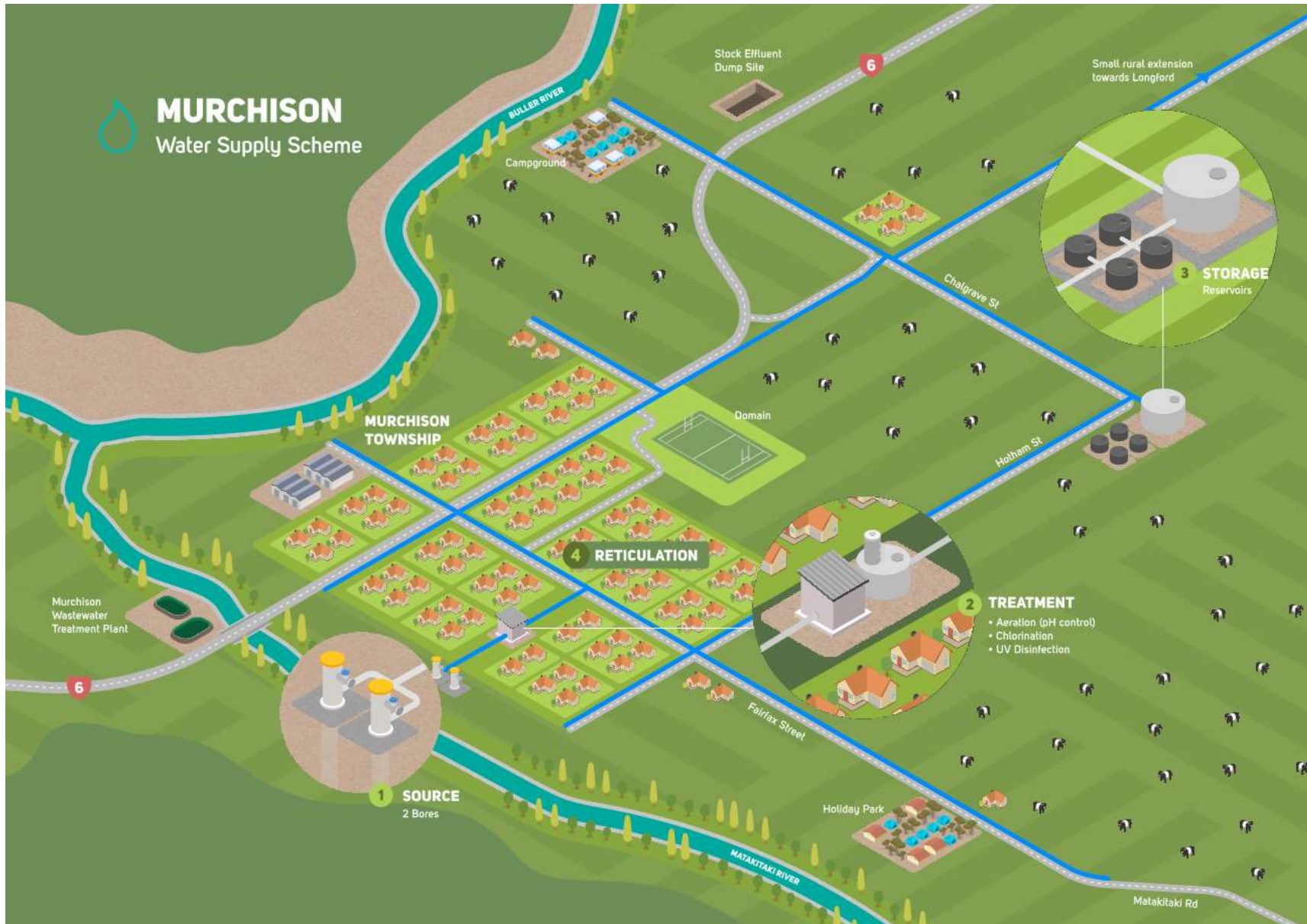




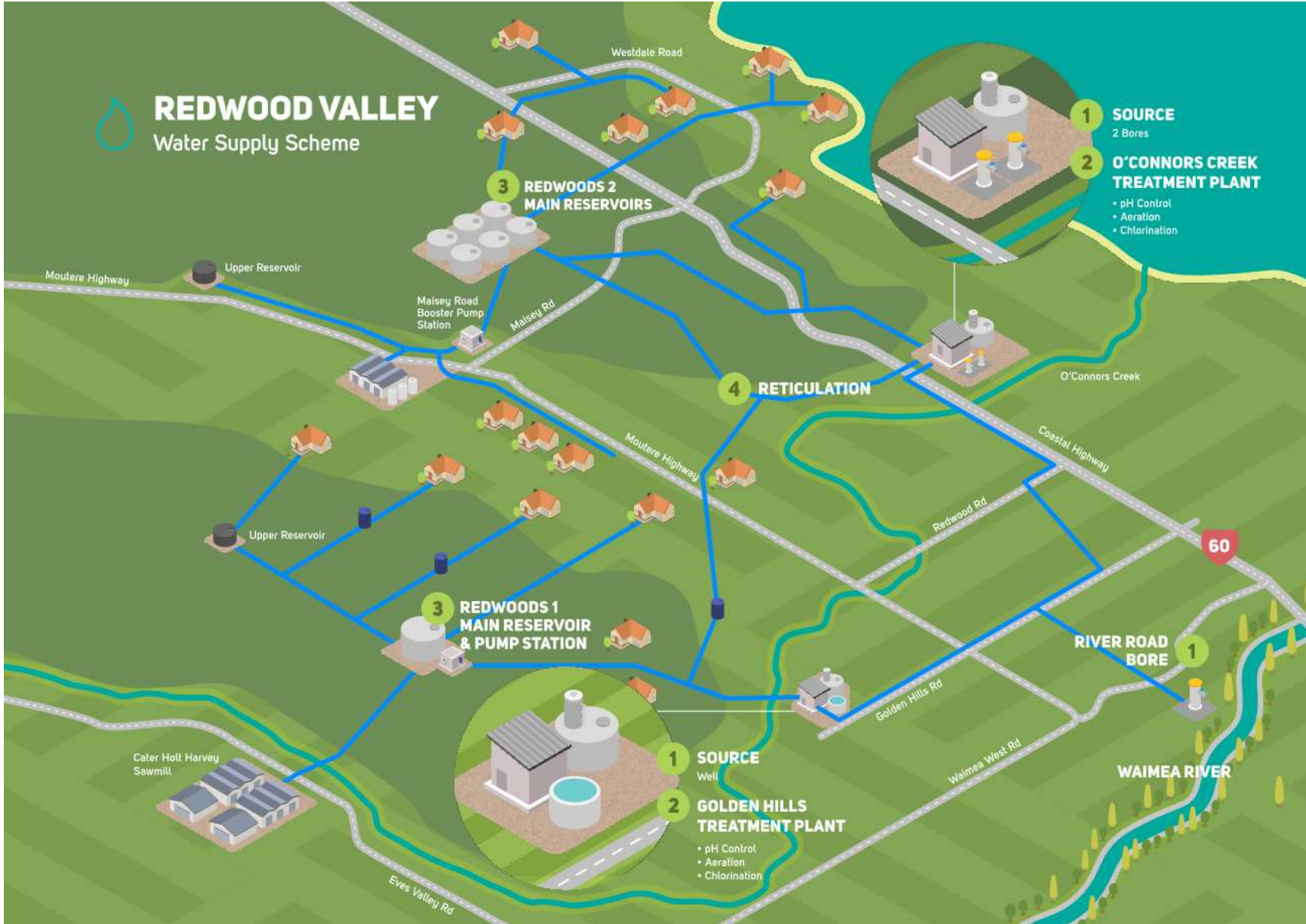


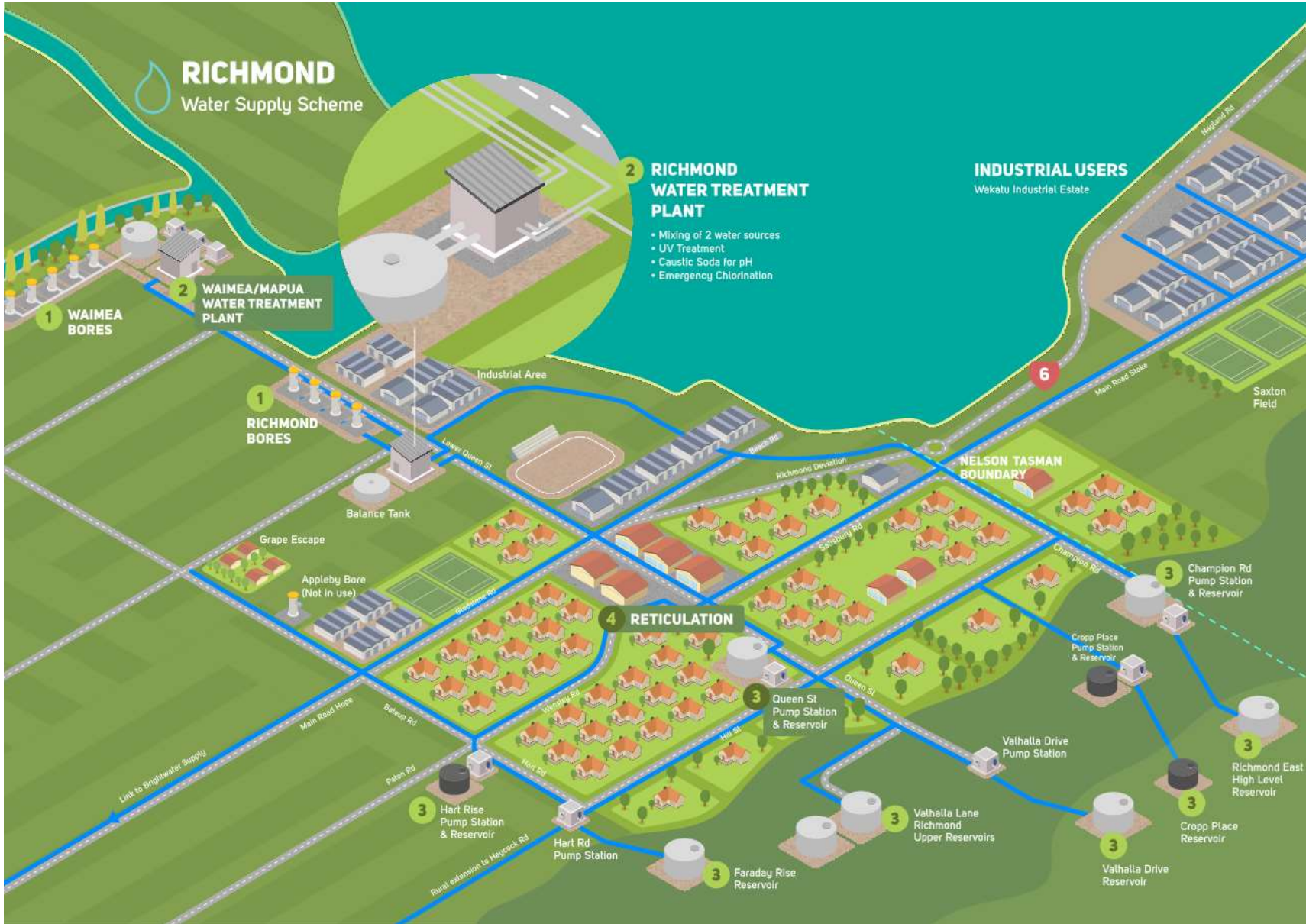


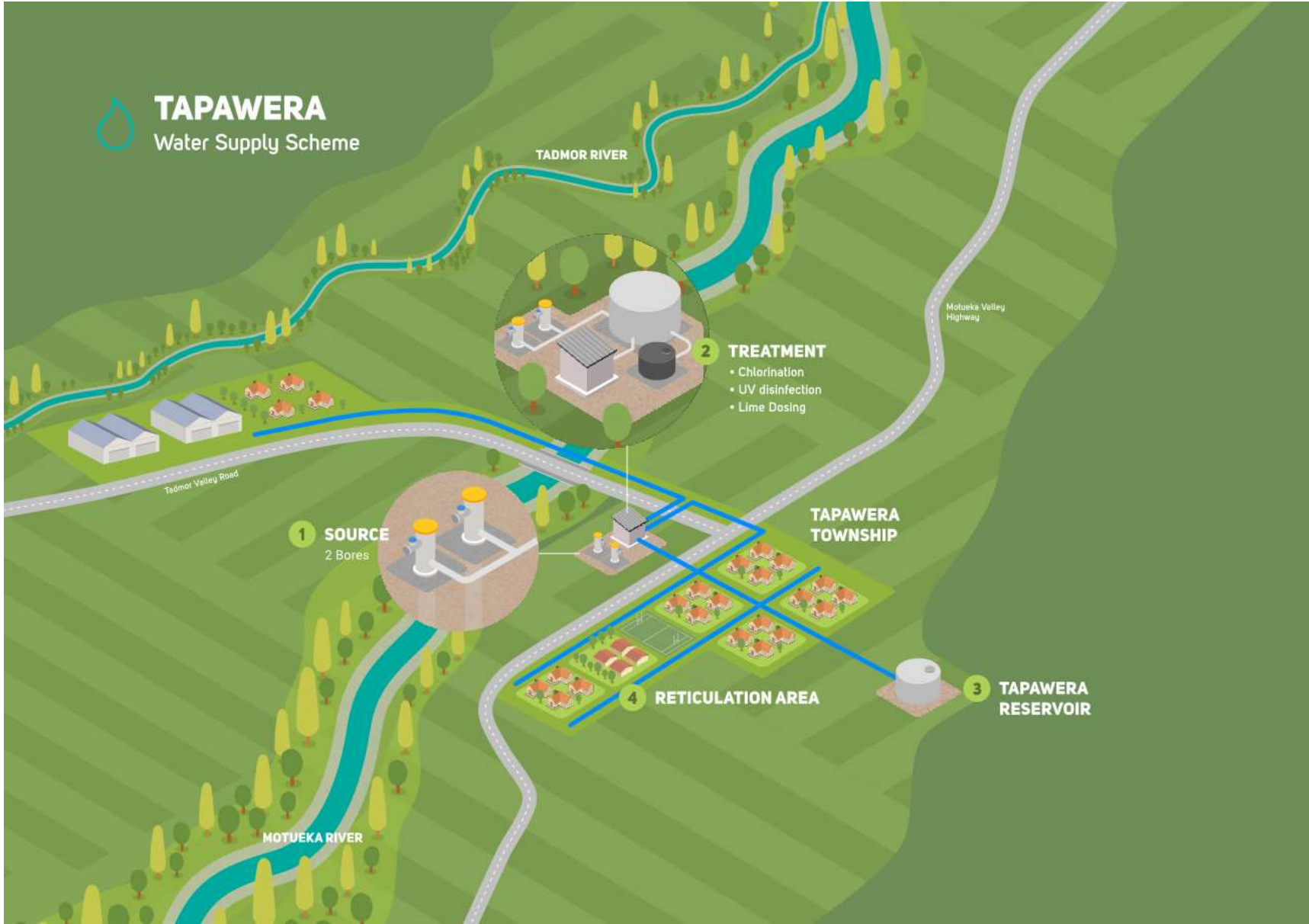










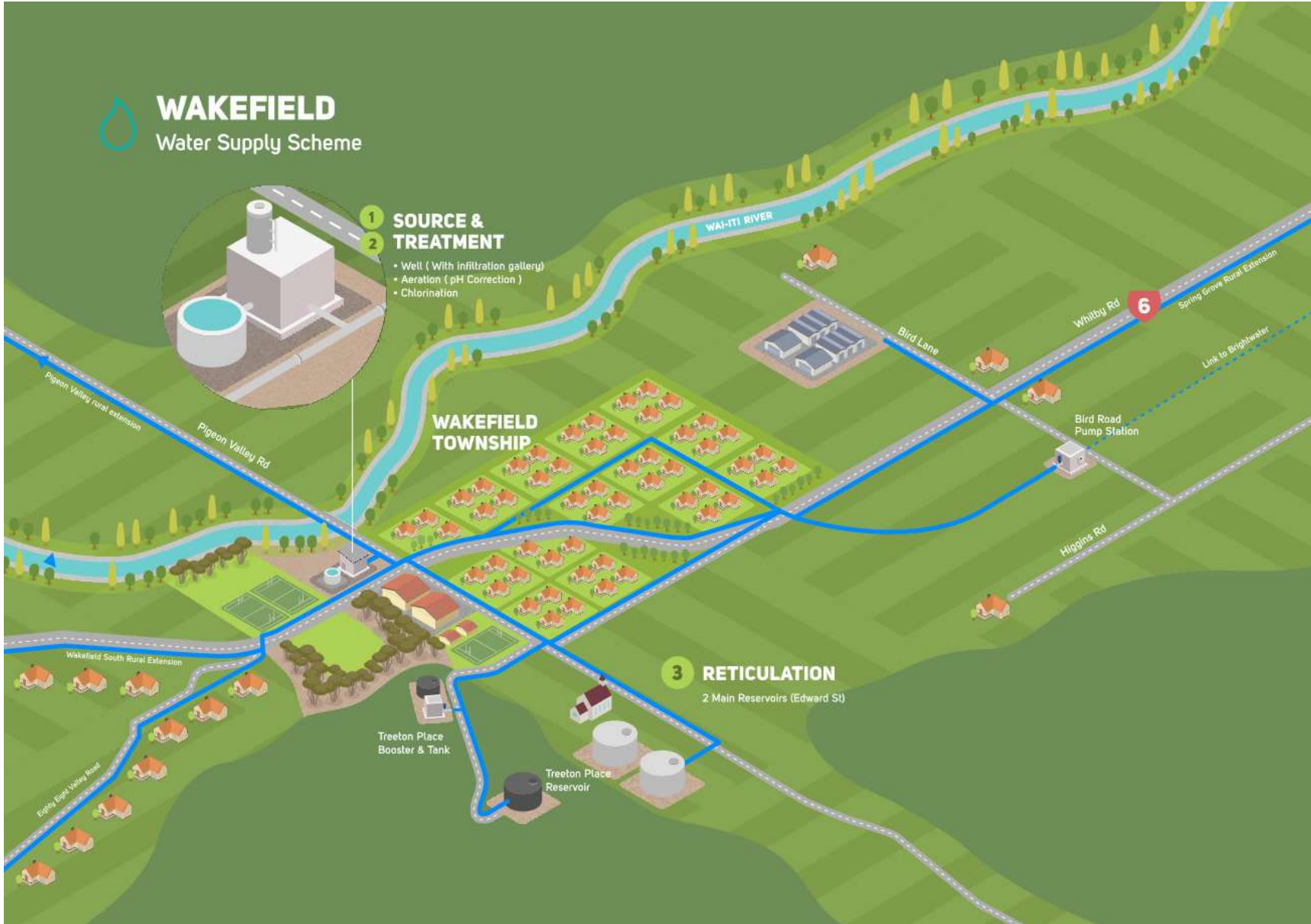




UPPER TAKAKA

Water Supply Scheme





Appendix D: Water Supply Network Maps

A water supply network map has been produced for the following schemes and included in Council's ActiveMannuals.

- Brightwater/Hope
- Collingwood
- Dovedale
- Eighty-Eight valley
- Kaiteriteri/Riwaka
- Mapua/Ruby Bay
- Motueka
- Murchison
- Pohara
- Redwoods 1 & 2
- Richmond
- Tapawera
- Upper Takaka
- Wakefield

Network schematics were not produced for Mapua Rise, Takaka and Hamama