



# ASSET MANAGEMENT PLAN

## Part B: Water Supply

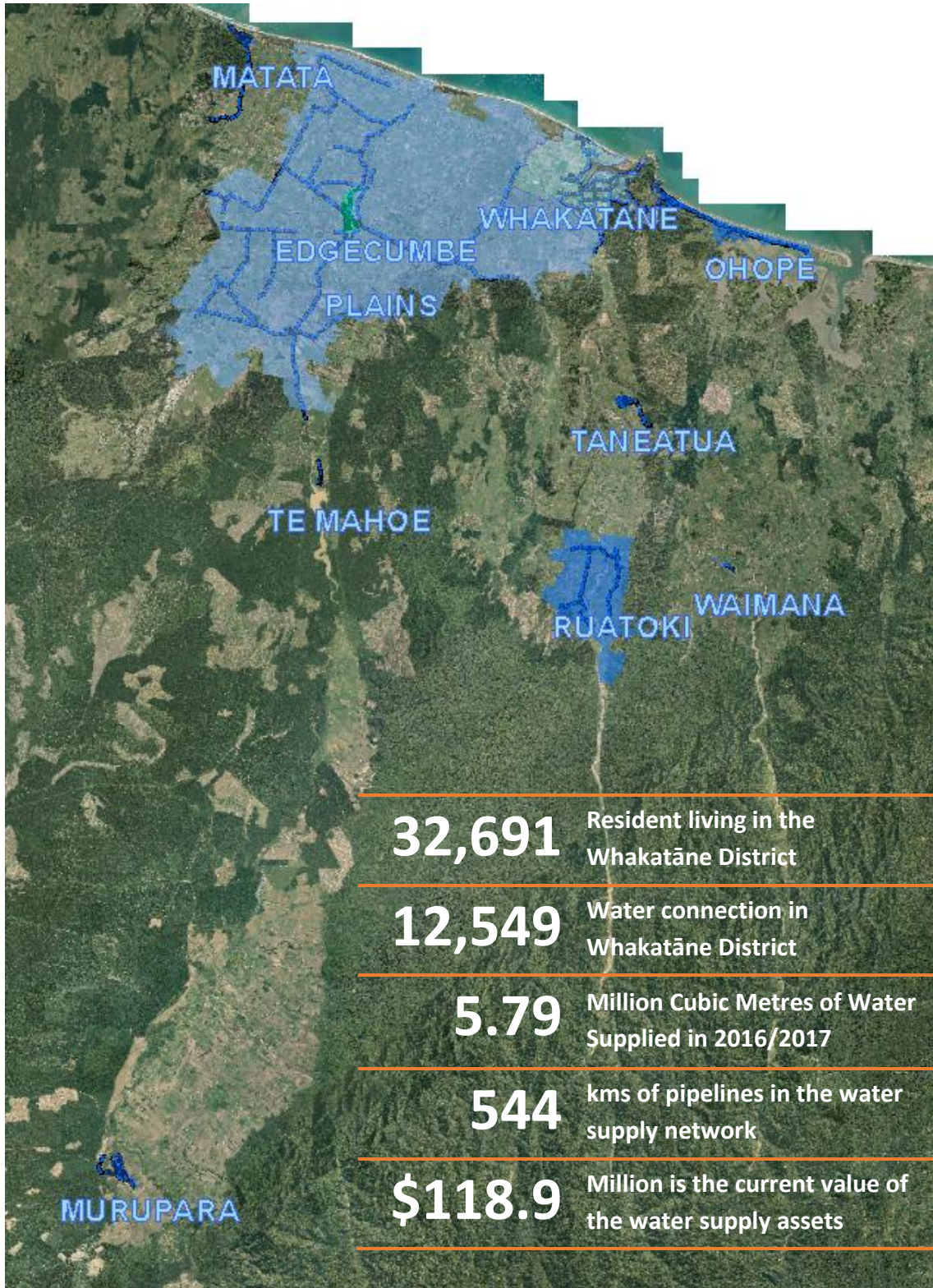
30 JUNE 2018

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## Asset Management Plan

### Part B – Water Supply

This Asset Management Plan provides the specific asset management information for the Water Supply activity, for the period 2018-2028.



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## 1 Executive Summary

Whakatāne District sits in the Eastern Bay of Plenty of New Zealand on the Pacific coast. The total land area is approximately 4,450 square kilometres. Sandy beaches are predominant along the 54 kilometres of coastline that stretches from Ōtamarākau in the west to Ōhiwa in the east. Central areas include fertile lowlands and farming areas on the Rangitāiki Plains through to Murupara. Te Urewera in the south, which makes 41% of the district, is protected native forest and is home to a rich array of flora and fauna.

Water Supply is an integral part of the Three Waters (water supply, stormwater and wastewater) that the Whakatane District Council (the Council) directly influences. The Council manages ten water supply schemes (Figure 2) which cover over 5,507 hectares land and 88.3% of the population in the district.

The Council provides a variety of infrastructure to manage water supply within our identified urban and residential areas. This infrastructure includes underground pipe, water meters, hydrants, valves, a water treatment plant, reservoir and pump stations, etc. The water supply systems are designed to treat raw water to make sure it is safe to drink and continuously supply this water to customers at a suitable pressure and quantity through a piping network. The Council's water supply system also provides water for fire services in urban areas. The Council undertakes these water supply activities because of statutory obligations, duty of care and public demand.

The Council developed this Asset Management Plan (AMP) to provide and maintain efficient, reliable, safe and sustainable water supply services. The Council's water supply activity contributes primarily to the following community outcomes:

- Reliable and Affordable Infrastructure
- Community Needs
- Valuing Our Environment

To achieve these objectives, this AMP is developed under the International Infrastructure Management Manual (IIMM) 2015.

### Key Issues:

- Population, growth and demand. The continuing growth and demand effects within the Whakatāne and Ōhope urban areas will require future upgrades to existing infrastructure. The main impacts are likely to include:
  - Increased pressure on existing Infrastructure
  - Increased operations and maintenance costs which will be reflect back to customer rates
  - Increased capital investment to extend water supply network.

- Climate change. Climate change and its related impact on water supply infrastructure is of growing concern. The Council needs to get smarter in determining these implications with ongoing infrastructure renewals and upgrade requirements.
- Affordability/levels of service. The Council is working with the community to determine programs ensure long term sustainability of assets. Key drivers such as community health and expectations, as well as ongoing legislative responsibilities are used to assist in the prioritisation of projects.
- New Drinking Water Standards and security of the water source.

### **Addressing Issues**

- Growth and demand issues are being addressed through demand management planning and network modeling. The Council is working to improve the condition assessment data held on Three Waters related infrastructure.
- In regard to climate change, the Council:
  - Monitors trends in climate change and will be reviewing the engineering standards and guidelines to cater for drought scenarios and flooding events
  - Liaises and shares information with central and regional Government
  - Plans for emergency operations and resilient design in the planning stage.
- Water supply system inadequacies and customer affordability will be investigated and where possible, projects will be developed, planned and included in the Long Term Plan (LTP).
- Due to the 'Havelock North' contamination incident in 2016, all levels of government are now actively working towards reducing any further similar incident occurring. There may be new legislation passed forcing regulatory compliance to certain aspects of the water supply.

In general, the water supply activity is driven by an increase in the levels of service to meet current planning and regulatory requirements. Council will strive to deliver affordable capital projects over the next ten-year period considering the issues and ongoing challenges facing Council.

### **The Costs**

Over 100 capital projects have been scheduled in the next 10 years with 32% on levels of service, 50% on renewals and 18% on growth. The total value of these projects is \$28.3 million.

The operational and maintenance cost scheduled for the next 10 years is \$71.4 million.

The revenue forecast for the next 10 years is \$69.4 million.

### **The context of this AMP include:**

- Water supply asset information is detailed in Section 2 giving an overview of the infrastructure and how Council manages this information.

- Levels of Service are key business drivers that influence all asset management decisions. The Council’s water supply activity primarily contributes to the community outcomes and is described in Section 3 - Levels of Service.
- Planning for future growth and demand is imperative to provide an economically sustainable pathway to meet the needs of residents and visitors in the District. The provision of the water supply activity and its management is an essential element in the planning process. Section 4 of this AMP describes how the Council manages growth and demand in water supply activity.
- Lifecycle management in Section 5 provides the broad strategies and work programs required to achieve the goals and objectives set out in previous sections of this plan. This section provides guidance on decision making techniques that aim to provide the most effective solution in delivering of defined levels of service.
- The Council recognises that this AMP is a “living” document needing continuous monitoring, changes and improvements over time. Section 7 describes the methods we will use to achieve this.

### **The Next Steps**

Actions resulting from this AMP are:

- ✓ Recognition that the AMP is a “living” document that will be reviewed and updated on an ongoing basis
- ✓ Continually improving knowledge and detailed asset information, including ongoing asset condition assessment and further collection of appropriate Meta data on assets
- ✓ Alignment of the AMP with newly developed Three Waters Strategy – Water Supply Roadmap (30 – 50 years)
- ✓ The development of key supporting documents to the AMP, including the Operation and Maintenance Plan, Emergency Management Plan and Infrastructure Risk Management Plan
- ✓ Obtaining feedback from our customers and the wider community, and adjusting asset management directions and levels of service if necessary
- ✓ The development of a communication plan to identify and incorporate all of Council’s stakeholders
- ✓ A commitment to community engagement and education programmes

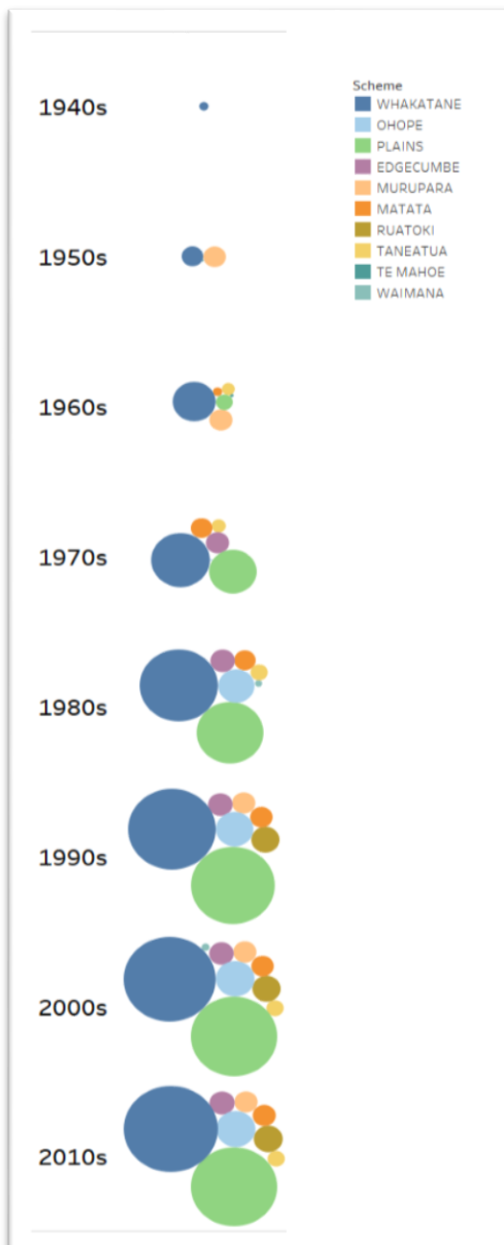


## 2 Introduction and Strategic Context

### 2.1 Service/Activity Description

Whakatane District Council (the Council) provides potable water to over 12,500 households and businesses throughout the District. The Council operates 10 different water supply schemes to provide water throughout the District with each scheme operating slightly differently. All of the water supplies except in Murupara and Penetito, are treated. The Council aims to provide water continuously and at a suitable pressure and quantity.

**Figure 1: Scheme Growth**



The Council provides a variety of infrastructure to deliver the potable water from the source to the customer supply point. This infrastructure includes bores, river intakes, pumps, treatment plants (devices), reservoirs, pipes, hydrants, valves etc.

Figure 1 on the left shows the history of the Council’s Water Supply schemes both in location and growth. The first scheme was built for Whakatāne Township in 1940’s. Murupara and Te Mahoe were built in 1950’s and the Plains, Matatā and Tāneatua schemes were established in 1960’s. In the 70’s Ōhope, Edgecumbe and Waimana had public water supply installed with Rūatoki the last of the schemes built in late 1970’s. These schemes have continuously expanded over the last seven decades to the current network, as we know it.

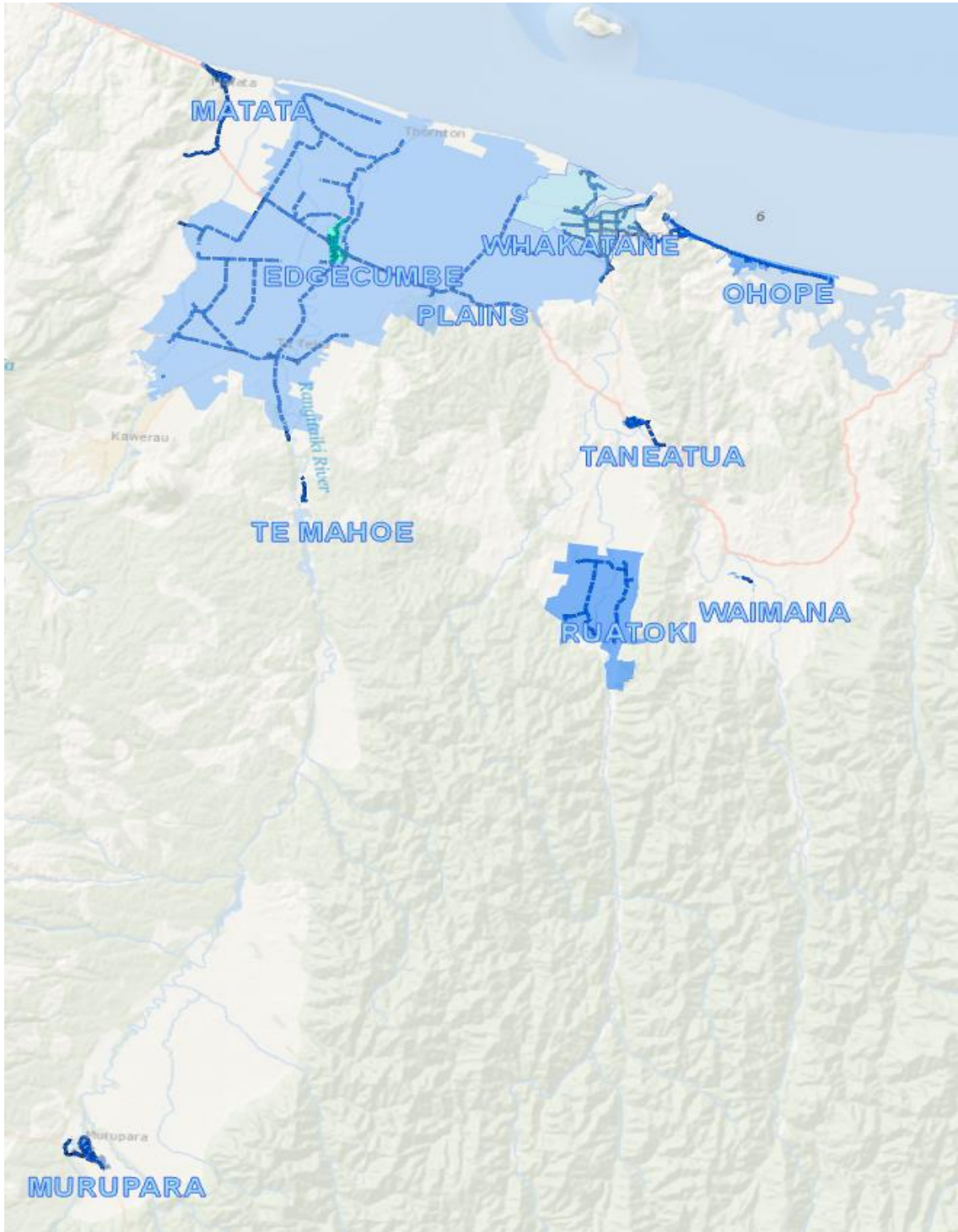
84% of water connections are metered. Customers are charged by a fixed access rate and a water usage component with the majority of metered connections within Whakatāne, Ōhope, Edgecumbe, Plains and Rūatoki, while other schemes have meters only on the commercial connections. Unmetered properties pay a fixed price based on average consumption rate.

The Council has developed this Asset Management Plan (AMP) to maintain the

current public water systems and provide a reliable supply of safe drinking water. The Council undertakes these water supply activities to meet statutory obligations and public demand.

Figure 2 below provides a brief overview and description of the Council’s water supply schemes. A simplified map of each scheme is in shown in Figure 2.

**Figure 2: Simplified map of each scheme**



**Figure 3: Brief overview and description of the Council's water supply schemes**

Scheme	Description
Whakatāne	Whakatāne scheme draws its water from the Whakatāne River adjacent to the treatment plant at Valley Road. The treated water then pumped to 3 reservoirs on the hill and distribute to Whakatāne township, Coastlands, Gateway industrial area. Whakatāne Scheme also delivers water to Ōhope Scheme.
Ōhope	Ōhope is a popular holiday destination. Tourist/visitor would triple the population in summer time. The water source is transferred from Whakatāne Scheme.
Edgecumbe	Edgecumbe water is currently from the Plains Water Supply Scheme but will be switched over to the new Otumahi Water supply scheme (due to be commissioned in early 2018).
Plains	Three water sources comprise this scheme. The major source is Braemar Spring while Johnson Road Bore and Tahuna Road are also supplying this Scheme. The small Penetito scheme has an independent supply network but is managed under the Plains Water Supply Scheme.
Tāneatua	The source of the water is from a shallow bore located off Puketi Road and the treated water is pumped direct to two reservoirs located on hills to east of the town.
Murupara	Water supply is via two bores and water is then pumped to reservoirs in the hill
Matatā	Jennings Spring is the source for this scheme and is transferred via gravity and booster pump to a Reservoir located in the hills above the township.
Waimana	Water is sourced from Hodges Road Bore. The water is pumped to reservoirs above the town.
Rūātoki	Water is taken from a shallow bore alongside the Whakatāne River. The water is chlorinated and UV treated and pump to a reservoir via a high-lift pump set.
Te Mahoe	Water is taken from a bore located in the village and pumped to the reservoir.

## 2.2 Key Partnerships & Stakeholders

Currently there are no partners involved in the delivery of water-related services to the Community. However, the possibility of shared services between the three Eastern Bay District Councils is regularly reviewed on an on-going basis. Although there are no formalised partnerships for water supply, some of the major water infrastructure is located on Māori Trust and on private land.

### 2.2.1 Key Partnerships

- Neighbouring Territorial Authorities including: Ōpōtiki District Council, Kawerau District Council, Western Bays District Council, Tauranga City Council and Rotorua Lakes District Council.
- Bay of Plenty Regional Council
- Community Groups and Boards
- Toi Te Ora Public Health and Ministry of Health
- Schools, Ministry of Education

- Department of Conservation.

### 2.2.2 Stakeholders

- The Whakatāne District community of owners, residents and ratepayers
- Ratepayers Associations
- Iwi consultation groups
- Iwi Liaison Committee
- Emergency service providers (Police, Ambulance, Fire, Civil Defence)
- Local community boards
- Utility companies – power, communication, gas
- Environmental groups
- Environmental and recreation interest groups
- Government agencies (Audit NZ, Ministry for the Environment), Housing NZ etc.
- Contractors
- Professional Service Providers
- Whakatāne District Council – Councillors, Committees and Community Boards, Water Management Board, CEO and Managers
- Three Waters Team
- Policy and Planning, Regulatory Services, Information Services, Human Resources, Financial and Corporate Teams

### 2.3 Overview of Assets

The Council manages ten water supply schemes as shown above in Figure 3. These cover over 5,507 hectares of land and 88.3% of the population in the district. Our water supply systems include bores, river intakes, pumps, treatment plants (devices), reservoirs, pipes, valves, hydrants, meters etc.

Table 1 below provides an overview of the different types of water supply assets managed by the Council. Further details are provided in the [Asset Management](#) section.

**Table 1: Overview of Assets and Valuations**

Asset	2017 Valuation Data
Pipes (km)	543.8
Service Line (km)	13.1
Valves	2,695
Pump Stations	17
Reservoirs	42
Treatment Plants	9

Valuation of our assets enables more effective and sustainable decisions and improves financial efficiency. Table 2 shows the Optimum Replacement Cost (ORC) for each scheme as a proportion of the whole.

Further details are provided in the [Asset Information](#) section below.

**Table 2: Gross replacement Values (\$) of Water Supply Asset for each scheme**

<b>Scheme</b>	<b>Gross Replacement Value(\$)</b>
Whakatane	\$79,174,611
Ōhope	\$8,805,312
Edgecumbe	\$3,196,066
Murupara	\$3,985,555
Taneatua	\$2,275,504
Te Mahoe	\$459,584
Matatā	\$3,007,612
Rūātoki	3,796,240
Waimana	\$587,124
Unknown*	\$5,757,218
Plains**	\$7,901,692
<b>Total</b>	<b>\$118,946,517</b>

\*Unknown: Assets cannot be allocated into specific scheme due to lack of information in the asset register

\*\*Plains: Assets mix-up in the asset register which are from Edgecumbe, Te Mahoe, Matatā

The Council's water supply assets perform well during day to day activities but during adverse weather events, some small aspects of the system do not meet the required levels of service, particularly during prolonged dry spells and extreme drought conditions. Continued development in the urban areas of Coastlands and Shaw Road, and the expansion of the industrial area will require upgrades to water supply infrastructure. Additional works are required to meet the levels of service in some of our schemes especially within the Plains system.

#### 2.4 **Goals and Objectives of Asset Management**

Water supply systems are essential to the delivery of critical quality of life services to our community. Good asset management contributes to the governance and management of a public entity's business and is an integral part of an organisation's wider servicing and financial planning processes.

The Council’s water supply activity primarily contributes to the following community outcomes:

- Reliable and Affordable Infrastructure
- Community Needs
- Valuing Our Environment

The activity outcomes developed with the Levels of Service represented in the AMP are described as follows and aligned with the Customer Values as shown in Table 3 below.

**Table 3: Customer Values and Activity Strategic Outcomes**

Customer Value	Activity Strategic Outcomes (Levels of Service)
Availability Affordability	▶ Provide a <b>continuous, safe, uninterrupted</b> and <b>cost effective</b> urban water system throughout the District’s urban and commercial areas that <b>complies</b> with the Drinking Water Standards.
Quality and Safety	▶ Customers are provided with adequate <b>safe</b> drinking water with reasonable <b>pressure</b> and <b>flow</b> .
Environmental sustainability	▶ To manage the effects of development upon the existing network and provide <b>sustainable</b> solutions for future generations.

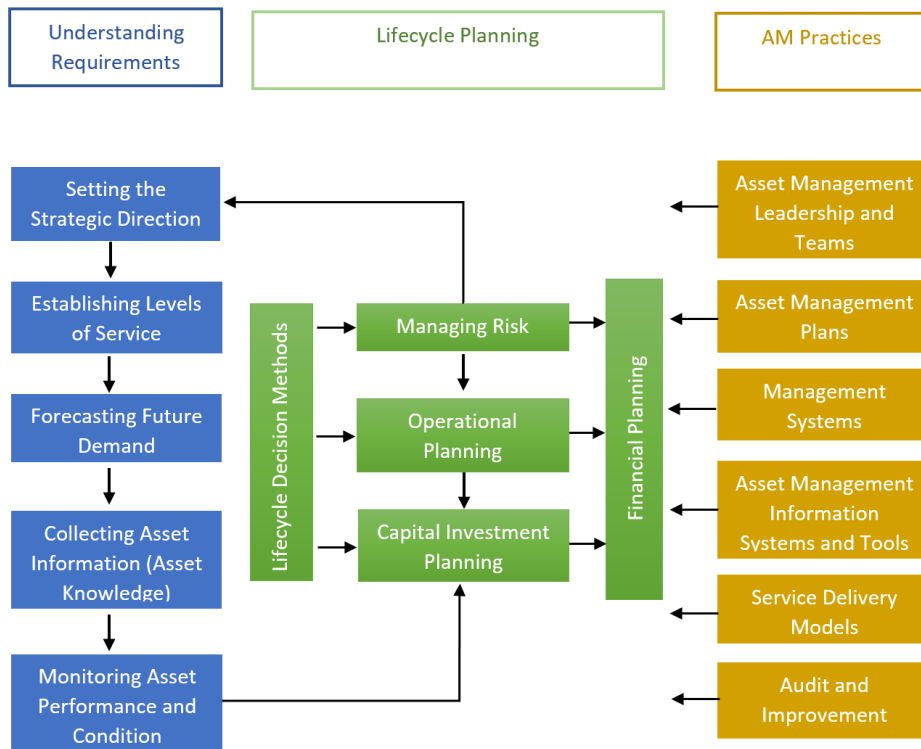
## 2.5 Plan Framework

The key elements of this AMP are:

- Strategic Direction (AMP – Part A)
- Levels of Service
- Future Demand
- Asset Knowledge
- Performance Monitoring
- Lifecycle Management
- Risk Management
- Operational Planning
- Capital Planning
- Financial Planning

Figure 4 below shows the Road Map for preparing an AMP (Source: International Infrastructure Management Manual 2015).

**Figure 4: Asset Management Plan Framework**



**2.6 Core and Advanced Asset Management**

This AMP has been prepared as a “core” AMP in accordance with the International Infrastructure Management Manual. The core AMP contains an approach to risk and critical assets, top-down condition and performance assessment, future demand forecasts, description of supporting asset management processes, ten-year financial forecasts, and a three-yearly asset management improvement plan.

Future revisions of this AMP will move towards “advanced” asset management plan by taking the following approaches:

- Analysis of actual asset condition based on visual inspections and performance trends
- Additional customer engagement in setting appropriate Levels of Services (LoS) and Optimised Decision-Making (ODM)
- Incorporating Corporate Risk management processes to major assets
- Improvement programmes with a focus on advanced maintenance scheduling
- Incorporation of new technologies where applicable, to deliver ODM.

### 3 Asset information

This section provides an overview of the water supply asset data, including how the asset information is collected, asset population, age profile, criticality, asset condition, asset valuations, etc.

#### 3.1 Asset Data Management

Data is captured and stored regarding the monitoring of performance against service levels, support optimisation of asset management practices and plan for future growth.

This AMP was developed utilising the Council’s existing asset management system, “Hansen”. Since 1 July 2017, the Council has been implementing and moving towards a more robust and user friendly Asset Management System called Xivic. As a result, a significant improvement will be seen in the next iteration of the Water Supply AMP.

##### 3.1.1 *Asset Data Management – How data is held*

Two asset systems are used to hold Three Waters asset data

- Hansen asset management system is the primary reciprocator for asset data, which:
  - Stores physical attributes of assets
  - Stores financial information of assets
  - Stores maintenance history of assets
- GIS system is the spatial analysis system, which:
  - Shows the assets in a user-friendly mapping system that can be utilised by all staff.

##### 3.1.2 *Asset Data Systems – How data is updated*

Data is updated in the following areas and/or from the following sources, when:

- New assets are created or vested in the Council
- Assets are renewed, replaced, upgraded or decommissioned
- Data is received from field staff and work orders
- Data is received from specific investigations, such as condition assessments, CCTV inspections, data collection exercises etc.

##### 3.1.3 *Asset Data Systems - How data is used*

- Information to customers, general public and stakeholders
- Understanding age, performance and condition of assets
- Investigation and systems analysis for capacity, growth, future renewal and upgrade programmes
- Asset valuation and insurance purposes
- For financial analysis

##### 3.1.4 *Asset Data Capture Program*

As with all assets, asset data capture is a critical component in improving the Council’s knowledge on its assets and running its business. In 2012, the Council undertook a Critical



Assets Identification and Maintenance data capture programme known as ‘AICAM project’ which focused on data capture and condition assessment of critical assets in a prioritised manner. There are currently gaps in the Council’s asset database whereby non-critical assets require data to be verified and captured. This is clearly seen in the last valuation report in which assets are misaligned from systems. The Council is undertaking programmes to clean the data and close this gap.

Quantities for water supply assets are given in the Table 4 below. The following financial information is based on 30 June 2017 data.

**Table 4: Water supply Asset Quantities and Valuation**

Asset Type	Unit	Quantities	ORC (\$)
Reservoirs	Each	42	\$7,567,083
Trunk Mains	Metres	287,929	\$63,373,953
Mains	Metres	255,918	\$24,015,131
Service Line	Metres	13,126	\$12,089,831
Pump Station	Each	17	\$4,321,246
Resource Consent	Each	11	\$83,542
Treatment Plant	Each	9	\$7,495,731

### 3.1.5 *Data Confidence and Reliability*

Based on a recent external valuation for water supply, the data supplied and used was given a combined rating of B – C which is a confidence level ( $\pm 25\%$ ). This rating clearly shows that the Council’s data within the Hansen database has anomalies and requires further attention and for this reason, the Council is moving towards the new asset management system. Table 5 below outlines the current asset confidence rating from the 2017 valuation although in some instances, the 2014 valuation data had to be utilised due to missing data.

**Table 5: Asset Confidence Ratings**

Asset Type	Costs/Rate	Quantity	Total Life	Remaining Life	Current Value (ODRC)
Reservoirs	C-D	C	B	A-B	B
Trunk Mains	B-C	B	A-B	B	B
Mains	B-C	B	A-B	C	B
Service Line	C	B	A-B	B	B
Pump Station	C	C-D	C	C	C
Resource Consent	C	C-D	C	C	B-C
Treatment Plant	D	D	C	C	C-D

### 3.2 Asset Condition

It is essential that the Council has a clear knowledge of the condition of its assets and how they are performing. An asset register including asset condition has been developed in the new AMS to enable the Council to understand future expenditure patterns and management decisions regarding maintenance and renewals.

The condition assessment model in Table 6 below is the basis for assessing the condition of the water supply asset. The Council's guidelines for the asset condition assessment is based on the definition within IIMM 2015.

**Table 6: Condition and performance rating system**

Grade	Condition	Description of Condition
0	Non-Existent	Asset is abandoned, 'moth-balled', decommissioned or no longer exists as part of the network
1	Very Good	Well-maintained, sound physical condition, no work required
2	Good	Showing slight defects and deterioration, acceptable physical condition, no work required
3	Fair or Moderate	Showing minor defects and deterioration, routine maintenance required to return to acceptable LoS, short-term failure unlikely.
4	Poor	Showing defects and deterioration, monitor, consider treatment and placement on renewals programme, short-term failure likely.
5	Very Poor	Serious defects, failed, failure imminent or has stopped working, unsafe to operate. Asset unserviceable, replacement or renewal required within 12 months.

### 3.3 Critical Assets

Asset criticality defines how important an asset component or asset facility is to the safe operation of the service. It is defined by the consequences that will occur if an asset or asset component fails.

In 2012, the Council undertook a critical Assets Identification Collection and Maintenance data capture programme known as 'AICAM project' which focused on data capture and condition assessment of critical assets in a prioritised manner. This data is currently being transferred into the Council's new AMS. The selection criteria for water supply critical assets include size, function and associated asset criticality as set out in Table 7 below.

**Table 7: Critical Asset Selection Criteria**

Asset type	Description of criteria
Pipes	<ul style="list-style-type: none"> <li>✓ <math>\geq 200\text{mm}\varnothing</math></li> <li>✓ All falling and rising mains to and from the source, reservoir and pump stations</li> <li>✓ Pipes which are important to supply critical customers</li> <li>✓ Pipes fail of which might affect more than 1,000 people</li> </ul>
Valves	All valves located along the critical water pipes
Water Pump Stations	All the water pump stations
Water Treatment Plant	All manholes associated with critical pipes
Floodgates	All
Pump stations	All

### 3.4 Asset Population

The Council manages 10 water supply schemes which cover over 5,507 hectares land and 88.3% of the population in the district.

#### 3.4.1 Water supply mains

Water mains form the majority of the assets within the water supply network. The purpose of water supply mains is to distribute water from service reservoirs and/or pumping stations to water connections for each customer. The Council currently owns and operates approximately 543.8km of pipe network with pipes sizes varying from 50mm $\varnothing$  (rider mains) to 450mm $\varnothing$  (Braemar Spring overflow pipe and Whakatāne Reservoirs emergency bypass pipe). The majority of water pipe sizes are 100mm $\varnothing$  (35.6%) and 50mm $\varnothing$  (34.5%). The two largest schemes are the Whakatāne urban area and the Plains and as expected, these have the greatest number and highest valuation of water pipe assets within the district and the majority of the pipe material is Asbestos Cement (AC) and Polyvinyl Chloride (PVC).

Figure 5 below shows the pipe length, installed year and valuation of each scheme. The most ageing scheme is Murupara, which the majority of the pipes were lay in 1954.

**Figure 5: Pipe Length, Installed Year and Valuation of Each Scheme**

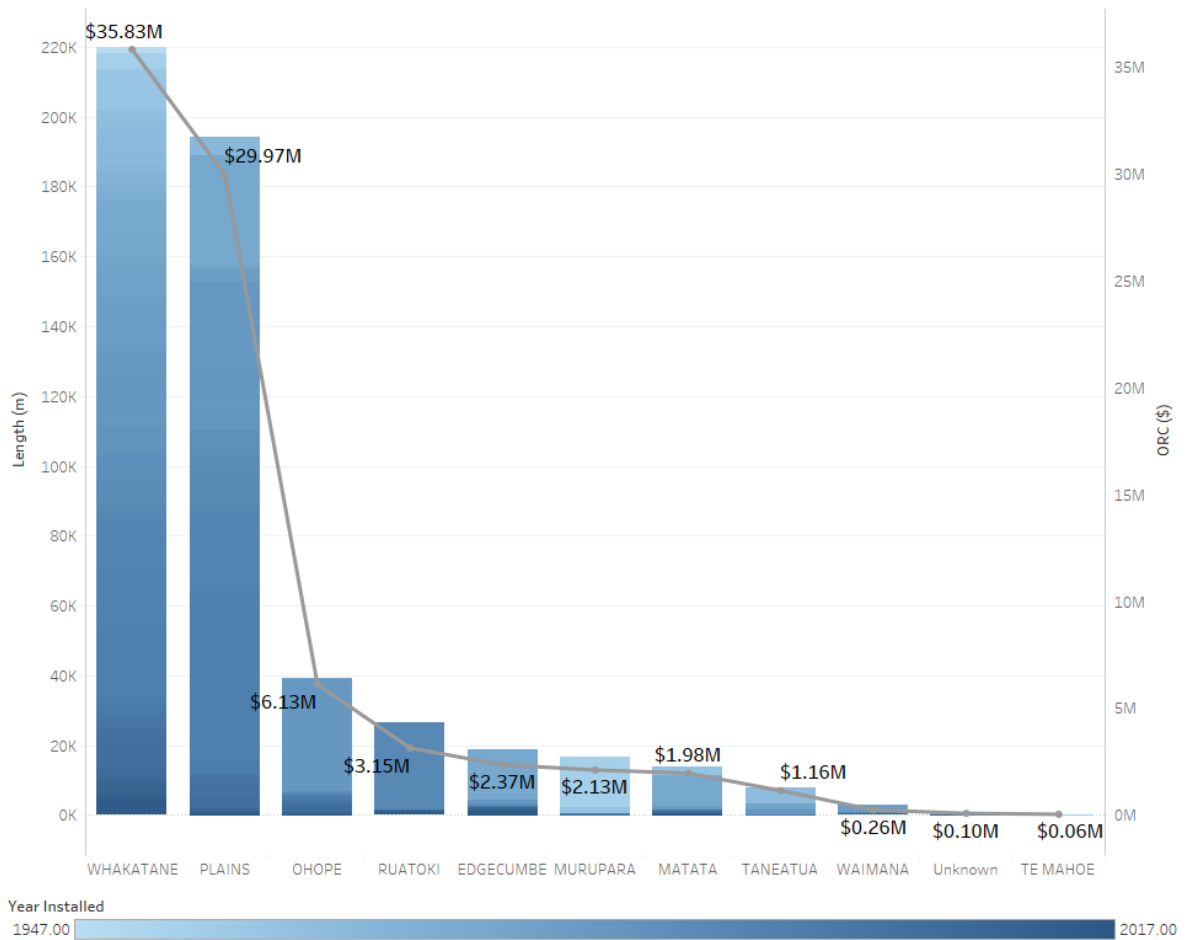
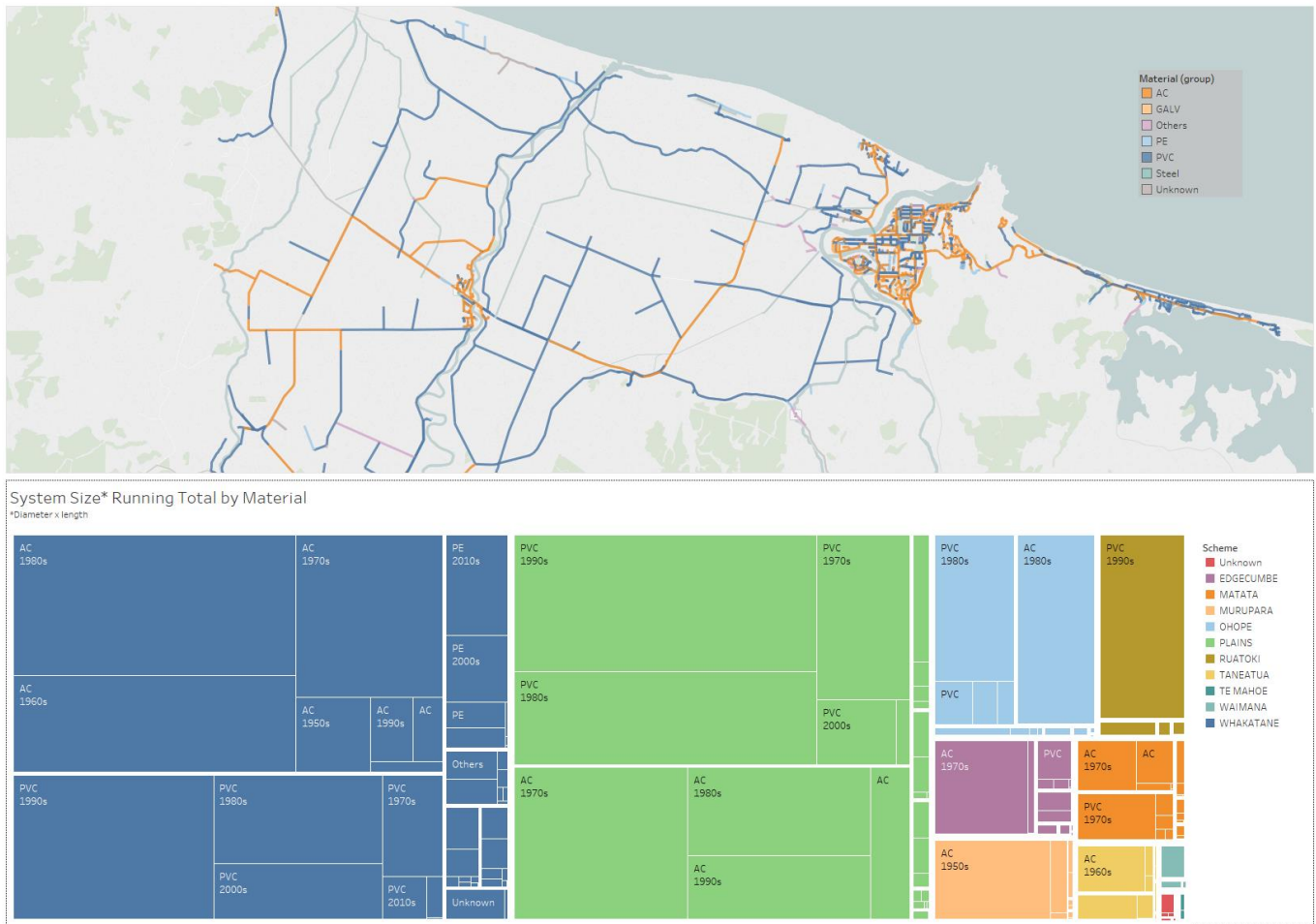


Figure 6 below shows the system size (length x diameter), materials and installation years for the different schemes. The size of the blocks represents the size of the system.

**Figure 6: Main System Size, Materials and Installation Periods**

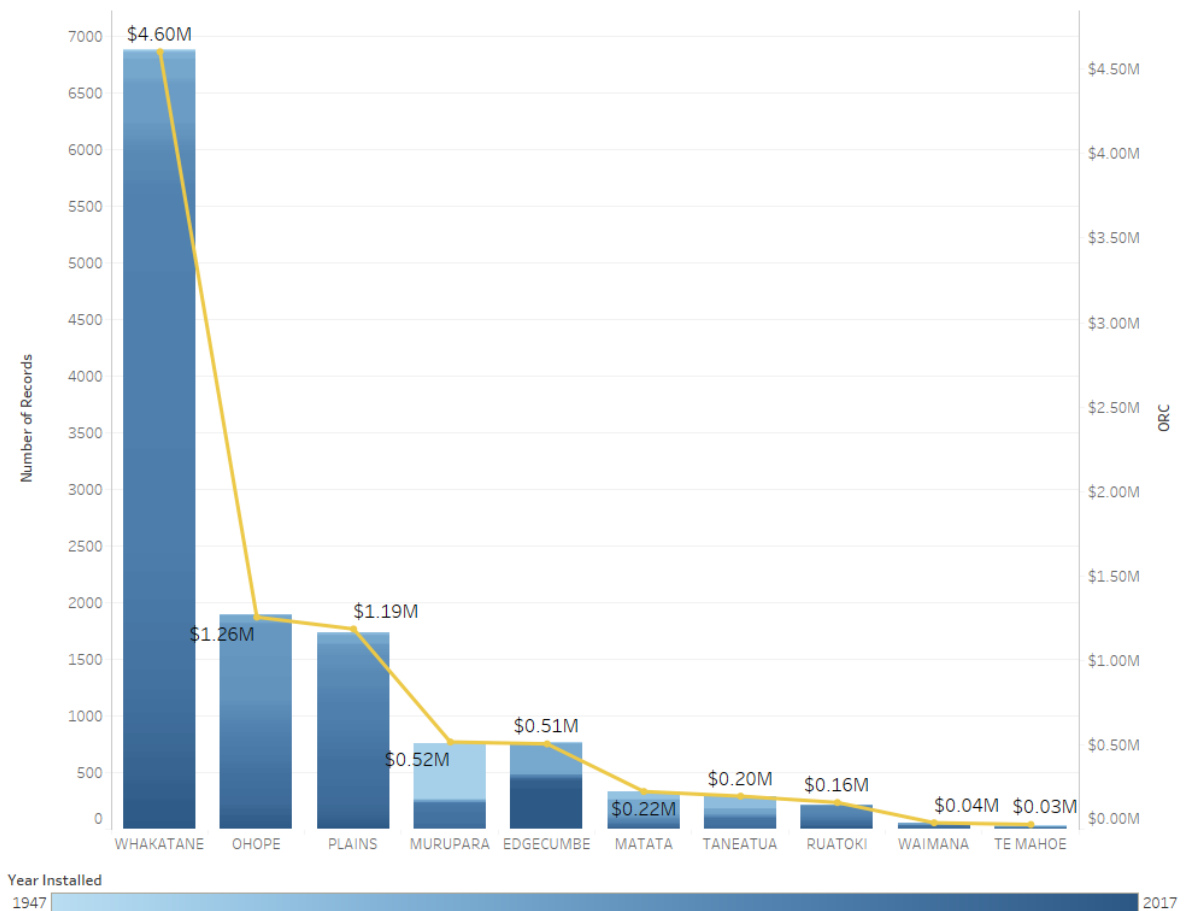


**3.4.2 Water Supply Service Connections**

The Council provides approximately 12,500 water connections to residents and businesses throughout the District. Service lines provide a connection from the Council’s water mains to the customer. Most of the service lines are 20mm diameter for domestic use and up to 100mm diameter connections for commercial property. Generally, with new materials the life age of service lines are up to 80 years, with majority of the pipe material being PE (60%) and PVC (35%). Within the district, the Council still has some galvanised pipe service lines which have a much shorter service life and will be part of renewals program based on condition and age.

Figure 7 below shows the numbers of water connection, installed year and valuation of each scheme and similar to watermains, Murupara has the most aging service lines in the District.

**Figure 7: Water Connection Numbers, Installed Year and Valuation of Each Scheme**



The Council maintains 11,088 water meters, which means just over 88% of connections are metered and these are generally within the Whakatāne, Ōhope, Plains, Rūātoki systems with all commercial properties within a council scheme also metered. In 2016/2017, The Council carried out water meter installation programme of all properties within the Edgecumbe Township but due to the unforeseen storm and flooding event of the township in April 2017, the Council decided to postpone charging properties by metered usage until financial year 2018/2019.

In line with best practice monitoring of water usage and to assist with demand management, Council is considering metering all water connections within the district. Water meters are classified as in average condition and the Council has an on-going programme to replace meters starting with the older meters.

**3.4.3 Fire Hydrants**

Fire hydrants are installed, owned and maintained by the Council. Fire hydrants are not listed as critical assets. Fire hydrants are typically positioned within the road reserve and are marked by a yellow cast iron lid. There are 1,124 fire hydrants within the water supply and the Council is looking at undertaking a condition assessment of all hydrants on a programmed basis. In the 2014/15 financial year, the Council worked closely with the Whakatāne Fire Brigade which undertook hydrant pressure and testing within the Whakatāne Scheme. 99%

of the hydrants were shown to be in good condition and met fire flow requirements. It is anticipated that this testing arrangement will be carried out for other schemes in the future.

#### 3.4.4 **Valves**

As at the 1 July 2017 valuation, there are 2,695 valves installed throughout the District network. The size of the valves varies from 20mm to 375mm with an average lifespan of 32 years. Table 8 below shows the value types and valuations.

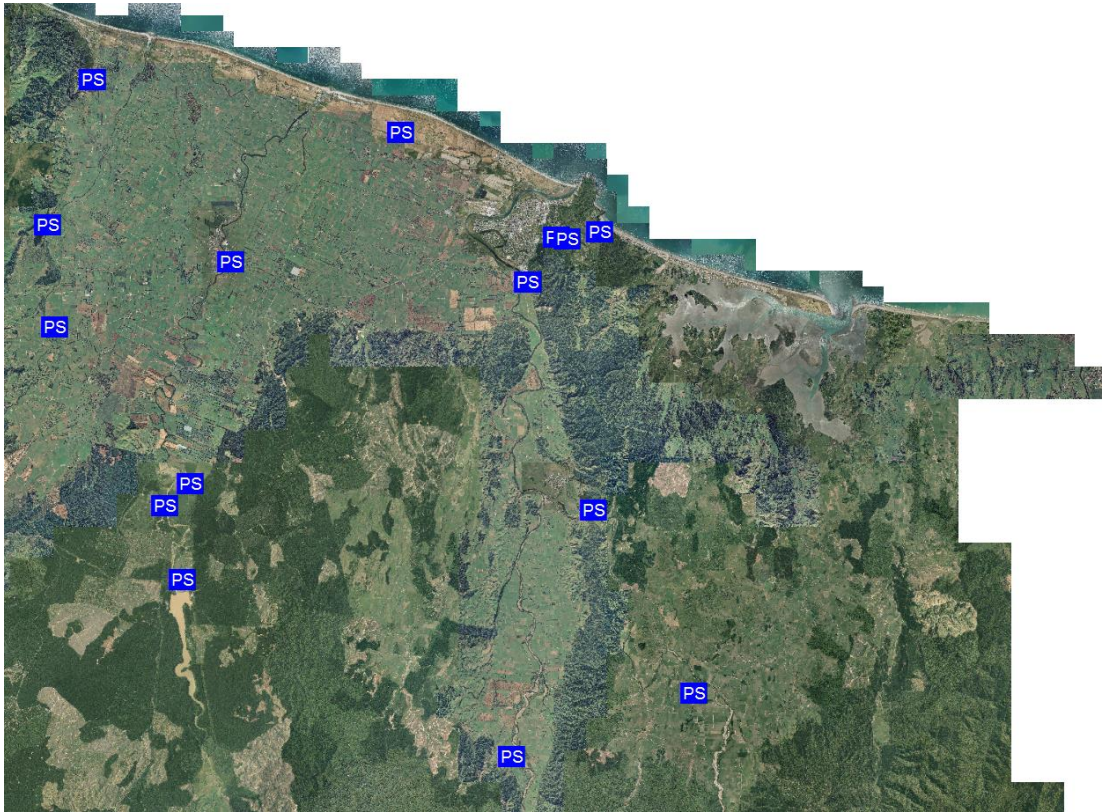
**Table 8: Valve Types and Valuations**

Valve Type	% of Total Number	ORC (\$)
Sluice	49.88%	\$2,378,166
Peet	41.16%	\$686,666
Air	2.26%	\$114,086
Scour	3.78%	\$104,901
Pressure Reducing Valves	0.62%	\$34,671
Others	2.30%	\$104,582

#### 3.4.5 **Water Supply Pump Stations**

The Council owns, operates and manages 17 water supply pump stations. Pump stations are used to pump water into the treatment plants, reservoirs and distribution network to ensure service levels relating to pressure and availability are provided. The locations of water supply pump stations are shown in Figure 8 below. A recent addition is a new pump station located within the Otumahi Water Scheme at Paul Road bore site, servicing the township of Edgecumbe and other parts of Plains, this station is due to be commissioned in 2018.

**Figure 8: Water Supply Pump Station Location\***



\*Murupara Pump Station is not shown in this map

### 3.4.6 **Water Supply Storage / Reservoirs**

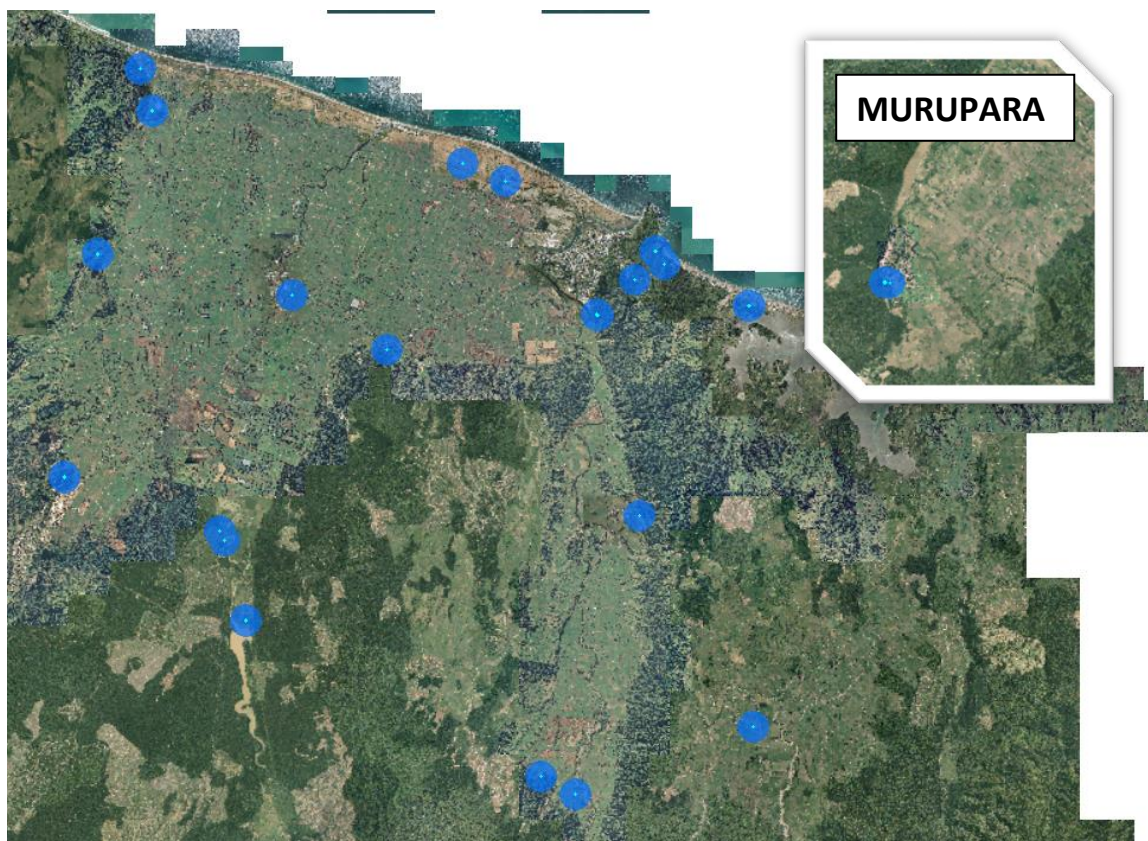
There are 42 reservoirs/tanks within the District network. The majority of these reservoirs are concrete while the remainder are either timber tanks, HDPE tanks or steel tanks. The purpose of reservoirs is to:

- provide sufficient reserves of treated water to ensure LoS are maintained;
- provide sufficient contact time for effective chlorination of water;
- assist in mitigating the risks associated with asset failure, treatment issues and major fires or flooding events.

The Council is preparing a programmed ongoing condition assessment of all reservoirs in the District. The majority of reservoirs are in good condition with some minor maintenance work required but all reservoirs will require resilience assessment against major events. The timber tanks in the District are over 30 years old and upon condition assessment, will be programmed for renewal in the future. The locations of the tanks are shown in Figure 9 below.



Figure 9: Location of Water Storage Tanks



### 3.4.7 Treatment Plants

There are nine treatment plants/ treatment headworks within the District. The purpose of these treatment facilities is to reliably produce water that meets drinking water standards in sufficient quantities to meet consumers’ demands. The Whakatāne Water Treatment Plant (WTP) is the only treatment plant with a multi-stage treatment facility (e.g. screening, coagulation, flocculation, clarification, filtration and dosing of chlorine for disinfection). The majority of water used in the District comes from groundwater sources with only the Whakatāne and Ōhope scheme taking and treating water directly from the Whakatāne River. Commissioning of the newly installed treatment plant at Paul Road will happen early in 2018.

### 3.4.8 Summary of Asset Valuation

Tables 9 and 10 show a summary of the Water Supply Asset Valuation Report up to 30 June 2017.

Table 9: Water Supply Asset by Scheme

Scheme	ORC(\$)	ODRC(\$)	AD(\$)
Whakatāne	\$79,174,611	\$42,852,761	\$1,140,809
Edgecumbe	\$3,196,066	\$1,760,505	\$45,479
Ōhope	\$8,805,312	\$5,107,988	\$127,656
**Plains	\$7,901,692	\$3,927,202	\$139,248

Matatā	\$3,007,612	\$1,381,240	\$44,769
Murupara	\$3,985,555	\$976,044	\$56,282
Tāneatua	\$2,275,504	\$1,065,405	\$35,066
Rūātoki	\$3,796,240	\$2,389,507	\$56,108
Waimana	\$587,124	\$271,359	\$11,654
Te Mahoe	\$459,584	\$108,435	\$13,122
*Unknown	\$5,757,218	\$3,718,481	\$74,972
<b>Total</b>	<b>\$118,946,518</b>	<b>\$63,558,927</b>	<b>\$1,745,165</b>

\*Unknown: Assets cannot be allocated into specific scheme due to lack of information in the asset register

\*\*Plains: Assets mix-up in the asset register which are from Edgecumbe, Te Mahoe, and Matatā

**Table 10: Water Supply Asset by Type**

Asset Type	ORC(\$)	DORC(\$)	AD(\$)
Treatment Plant	\$7,495,731	\$2,222,600	\$176,669
Pump Station	\$4,321,246	\$1,148,327	\$104,479
Reservoir	\$7,567,083	\$3,785,398	\$99,833
Trunk Main	\$63,373,953	\$33,695,657	\$821,928
Main	\$24,015,131	\$15,132,862	\$311,404
Service Line	\$12,089,831	\$7,557,791	\$228,148
Resource Consent	\$83,542	\$16,292	\$2,703
<b>Total</b>	<b>\$118,946,517</b>	<b>\$63,558,927</b>	<b>\$1,745,164</b>

### 3.5 Resource Consents

Resource consents are a requirement for water supply management works due to the potential impact of water takes on the environment and other customers. It is important to capitalise and value resource consents for the network.

The Council has a database of consents that relates to water supply management activities, which is shown in the Table 11 below. In accordance with both Regional and District Plans, a number of requirements must be met during the life of the consent. These requirements will stipulate monitoring conditions in the consent and will require the consent holder to report on the compliance with those conditions.

**Table 11: Consents related to water supply management activities**

Permit Number	Permit Activity Type	Permit Purpose	Permit Location	Permit Granted Date	Permit Expiry Date
20094	Take	To take and use water for the purpose of water supply to Edgcumbe Township and Rangitāiki Plains	Rangitāiki Plains and Edgcumbe Township	5/04/1973	1/10/2026
20114	Take	To take and use water from an underground stream for public water supply purposes	An underground stream adjacent to the Rangitāiki River situated in State Forest No.1 (Source of Supply)	6/09/1973	1/10/2026
20235	Take	Take water from a spring for a public water supply	Ruatāhuna Township	1/04/1976	1/10/2026
20280	Take	To take water from a spring at Awakaponga for community water supplies	Matata Township	2/12/1976	1/10/2026
20283	Take	To take water from a well for the Waimana water supply	Well on the Grantee's Property Hodges Road Waimana	2/12/1976	1/10/2026
21044	Take	Take water from bores adjacent to the Waimana River for Tāneatua Town water supply	Tāneatua community water supply	2/12/1982	1/10/2026
62627	Take	Take water from a bore for community water supply	Rūātoki	14/06/2004	30/09/2019
64943	Take	Take water from a bore for community supply at the Te Mahoe Village	Te Mahoe Village, Matahina	21/09/2007	31/07/2022
65622	Take	Take water from a bore for municipal supply	485B Tahuna Road, Te Teko	9/03/2009	28/02/2019
66359	Bore	Take and use water from a bore for municipal supply	124 Paul Road, Te Teko	1/11/2010	30/09/2045
20198-1	Take	Take and use water from the Whakatāne river for a municipal water supply and also a right to discharge waste water to the river	Adjacent to Whakatāne Borough Treatment Plant	3/07/1975	1/10/2026
RM15-0017-WT.01	Take	Under section 14(2)(a) of the Resource Management Act 1991, Rule 43 of the Bay of Plenty Regional Water and Land Plan and Rule 16.8.5(f) of the Regional Plan for the Tarawera River Catchment being to Take Water From a Bore	58A Johnson Road, Otakiri	15/12/2016	31/12/2031
RM15-0017-WT.02	Take	Under section 14(2)(a) of the Resource Management Act 1991, Rule 43 of the Bay of Plenty Regional Water and Land Plan and Rule 16.8.5(f) of the Regional Plan for the Tarawera River Catchment to Take Water From a Bore	58A Johnson Road, Otakiri	15/12/2016	31/12/2031

Permit Number	Permit Activity Type	Permit Purpose	Permit Location	Permit Granted Date	Permit Expiry Date
RM15-0017-WU.01	Take	The purpose of this resource consent is to authorise and specify conditions associated with the use of water from well no. 2510 and well no. 2511 for municipal supply.	58A Johnson Road, Otakiri	15/12/2016	31/12/2031
64253	Multiple Activities	<p>A) To disturb the bed of the Whakatāne river</p> <p>B) To place and use structures over the bed of the Whakatāne river</p> <p>C) Take water from the Awatapu Lagoon for the purposes of flood protection, pump station maintenance and algae control</p> <p>D) Discharge water from the Awatapu Lagoon to the Whakatāne river for the purposes of flood protection, pump station maintenance and algae control</p>	Riverside Drive, Awatapu, Whakatāne	12/04/2007	31/03/2042

## 4 Levels of Service (LoS)

LoS are key business drivers and influence all asset management decisions. The Council’s water supply activity primarily contributes to the following community outcomes:

- Reliable and Affordable Infrastructure
- Community Needs
- Valuing Our Environment

The water supply strategic LoS developed in the AMP are described as:

- Provide a quality continuous, safe, uninterrupted, cost effective and adequate urban water supply system accessible throughout the District’s urban and commercial areas that complies with the Drinking Water Standards.
- Customers are provided with adequate safe drinking water with reasonable pressure and flow.
- Managing the effects of development upon the existing network by providing sustainable solutions for future generation and educating communities about water consecration and water contamination issues for both public and private supplies.

The legislative framework also affects LoS standards. There are a number of legislative mechanisms aimed at avoiding and/or mitigating any potential adverse environmental effects associated with water supply management.

Based on the contents above, the Council has developed SMART (Specific, Measurable, Achievable, Relevant, Time bond) measures as described in the [Performance Measures](#) section below.

### 4.1 Legislative Framework

Table 12 below contains a general outline of the statutory provisions relevant to LoS.

**Table 12: Legislative requirements**

National	
Local Government Act 2002	<p>Section 130 of the Local Government Act 2002 (LGA) requires territorial authorities to continue to provide water services to those communities that have been serviced. A Council cannot use water assets as security, divest ownership to a non-local government organisation, lose control of, sell, or otherwise dispose of the significant infrastructure for providing water services.</p> <p>Section 3(1)(a) of Schedule 10 requires that the LTP include a statement of the amount of capital expenditure that is budgeted to meet additional demand for an activity.</p> <p>Part 7 includes a requirement (Section 125) to assess water and other sanitary services so that the community can have confidence that the public health of the community is adequately protected.</p> <p>The LGA also requires that the Significance and Engagement Policy shall identify all of the assets the Council considers to be strategic. In this regard, the Council considers all water assets to be strategic.</p>

	<p>Schedule 10 Section 6 requires that the LTP identifies and explains any significant variation between the proposals outlined in the Long Term Plan and the Assessment of Water and Sanitary Services.</p>
<p>The Health Act 1956 and Health (Drinking Water) Amendment Act 2013</p>	<p>The Health Act 1956 was amended by the Health (Drinking Water) Amendment Act 2013 and aims to protect public health by improving the quality of drinking-water provided to communities. The Act contains the following requirements:</p> <ul style="list-style-type: none"> <li>• Drinking-water suppliers to take all practicable steps to ensure they provide an adequate supply of drinking water that complies with the New Zealand Drinking-Water Standards;</li> <li>• Drinking-water suppliers to introduce and implement public health risk management plans (These plans are now called “Water Safety Plans”);</li> <li>• Drinking water suppliers take reasonable steps to contribute to the protection from contamination of sources from which they obtain drinking water;</li> <li>• Officers appointed by the Director-General of Health to act as assessors to determine compliance with the Act and to have their competence internationally accredited;</li> <li>• Record keeping and publication of information about compliance;</li> <li>• Provides for the appropriate management of drinking-water emergencies;</li> <li>• Improves enforcement by providing an escalating series of penalties for non-compliance.</li> </ul>
<p>Civil Defence Emergency Management Act 2002</p>	<p>The Civil Defence Emergency Management Act 2002 requires that a risk management approach be taken when dealing with hazards. In considering the risks associated with a particular hazard, both the likelihood of the event and the consequence must be considered (Refer to Risk Management Section in this AMP).</p>
<p>The Resource Management Act (1991)</p>	<p>The Resource Management Act 1991 (RMA) promotes the sustainable management of natural and physical resources. It specifies the roles and responsibilities in terms of managing effects on the environment.</p> <p>In relation to water supply, the RMA would require the adverse effects associated with activities such intake points, treatment plants, reservoirs, bores, pump stations and pipes to be avoided, remedied or mitigated. This will be imposed through the Regional and District Plans.</p>
<p>National Standards (Drinking Water Standards New Zealand 2005 (Revised 2008) )</p>	<p>The objective of the Drinking Water Standards New Zealand 2005 (Revised 2008) (NZDWS) is “to ensure all New Zealanders have access to good quality drinking water.”</p> <p>Compliance with NZDWS continues to be a focus, with works planned and budgeted for to increase compliance levels including:</p> <ul style="list-style-type: none"> <li>• Alternative water source (Otumahi) and to address arsenic issue in parts of Plains</li> <li>• The new legislation requires a Water Safety Plan (WSP) to become a mandatory document. WSPs for relevant systems have been prepared and progressively sent through to the Drinking Water Assessor of Toi Te Ora Public Health throughout 2018 and 2019 for approval.</li> </ul>

District	
Documents	Requirement
District Plan	<p>The Whakatāne District Plan (adopted in 2017) assists the Council to carry out its functions under the RMA in order to achieve the purpose of the Act to promote the sustainable management of natural and physical resources.</p> <p>In this context, the Whakatāne District Plan outlines the rules, objectives, policies. The District Plan also contains designations where land has been designated for network utility or large public works that enable works to be undertaken in accordance with the purpose of the designation.</p> <p>In addition to national legislation and guidelines, the District Plan provides rules that apply to subdivision, land use consent. The District Plan acknowledges the need to develop, operate and maintain network utilities throughout the District while avoiding, remedying or mitigating the adverse effects on the environment.</p>
Engineering Code of Practice	<p>The Engineering Code of Practice establishes water supply performance standards in the Whakatāne District. The Council is currently revising the Engineering Code of Practice and reviewing whether collaboration with other Territorial Authorities is warranted. Complete review and adoption is anticipated in mid-2020.</p>
Bylaws	<p>The Council adopted a revised Combined Waters Bylaw in December 2017. Part 2 of this Bylaw focuses on water supply. The objectives of this part of the Bylaw are to:</p> <ol style="list-style-type: none"> <li>a. Promote the efficient use of water, manage demand for water and protect against waste or misuse of water;</li> <li>b. Protect the water supply from contamination;</li> <li>c. Regulate the use of land, structures and infrastructure associated with the water supply system to protect these assets from damage, misuse or loss;</li> <li>d. Prevent unauthorised connection to the water supply system;</li> <li>e. Define the obligations of the Council, installers, owners and the public in matters related to the water supply system;</li> <li>f. Determine or measure the volumes of water consumed on any premises for rating purposes and/or demand management and/or billing and/or to locate any water leaks at the premises.</li> </ol>

#### 4.2 Water Quality

The quality of the water is affected by the quality of the source water and to what level the water is treated. The water supplied to customers should carry little or no contaminants, have a high enough level of residual chlorine to reduce the risk to a very low level of infection from waterborne microorganisms, and be clear and odourless. A brief summary of the water quality is shown in Table 13 below. Details of the technical standards can be referred to in the Drinking Water Standard NZ.

**Table 13: Water Quality Summary**

Determinant	Description	Target
<b>E Coli</b>	The dictator organism specified by DWSNZ to indicate possible contamination of drinking water.	<1 in 100ml
<b>Chlorine Residual</b>	A measurement of the disinfection efficiency.	0.6-0.1 mg/L
<b>Turbidity</b>	A measurement of the effectiveness of the filtration process and general physical condition of the water.	0.5NTU
<b>pH</b>	Acidity	6-8

The Council is part of the Territorial Local Authority Freshwater Collaboration Group and is working closely with Bay of Plenty Regional Council (BOPRC) on ‘Risk Assessment Collaboration on Safer Drinking Water’ which involves a close working relationship between TLA, Toi Te Ora and BOPRC. This Group is producing a region wide view of risks for drinking water with the primary focus on source water. A risk register is currently being developed to clearly show that we understand the risks for drinking water across the region and who owns the mitigation of these risks (based on roles and responsibilities). Once the risk register is finalised, the intention is to have seek confirmation from Councillors that they are comfortable with the level of risk and the mitigation activities being undertaken by staff.

#### 4.3 **Community consultation**

The Council has engaged in a range of consultation approaches to both seek public opinion and to communicate its decisions and programmes to residents in the District. Additionally, other external organisations have undertaken public surveys comparing services within various regions.

Customer research carried out which included water supply questions includes:

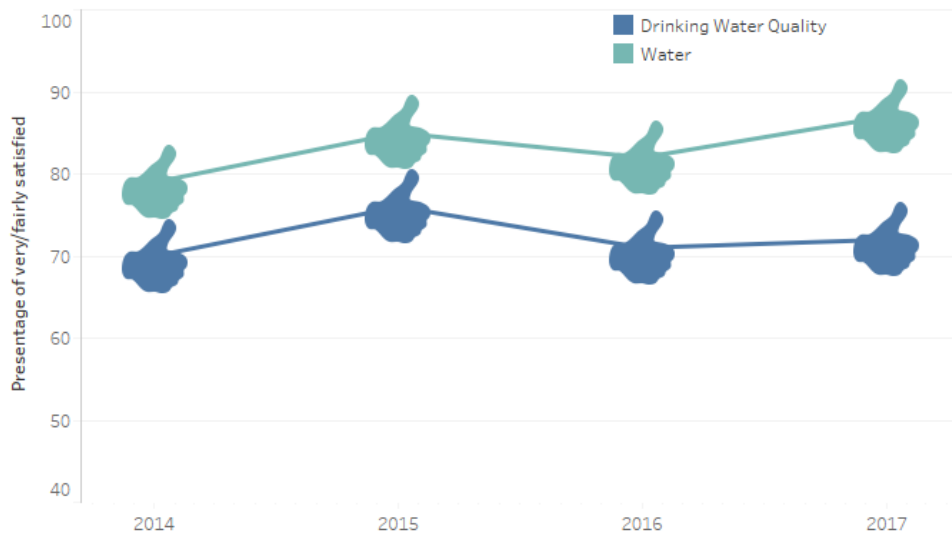
- Whakatāne Te Hara
- Whakatāne District Council Annual Residents Survey (Communitrak™ Survey 2017)
- NZ Water Consumer Survey 2017
- Customer service requests and complaints
- LTP Consultation and Assessment of Water and Sanitary Services
- Consultations on the affected areas after major water supply events

##### 4.3.1 **Whakatāne District Council Annual Residents Survey**

The result of the survey is shown in Figure 10 below.



**Figure 10: Annual Residents’ Survey Result from 2015 - 2017**



The results of this survey in 2017 showed that most residents (87%) are satisfied with the Council’s water service. Residents are less satisfied with the drinking water quality at 72%. This is mainly due to the slightly raised arsenic level in the Plains water supply and the taste of chlorine used for disinfection.

**4.3.2 Customer Service Request and Complaints**

The Council operates a customer service call centre. All Requests for Service (RFS) are collected and recorded in the Council’s Ozone system that has been operating since 2009.

21,890 RFS were created between 1/7/2009 and 30/06/2017 for Three Waters. Water relative RFS accounted for largest portion at 86.81% of all RFS. Figure 11 below shows the breakdown of Water RFS since 2009.

**Figure 11: Three Waters RFS since 2009**

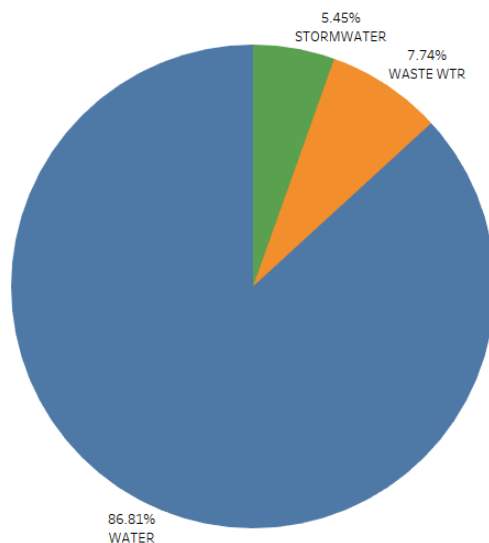
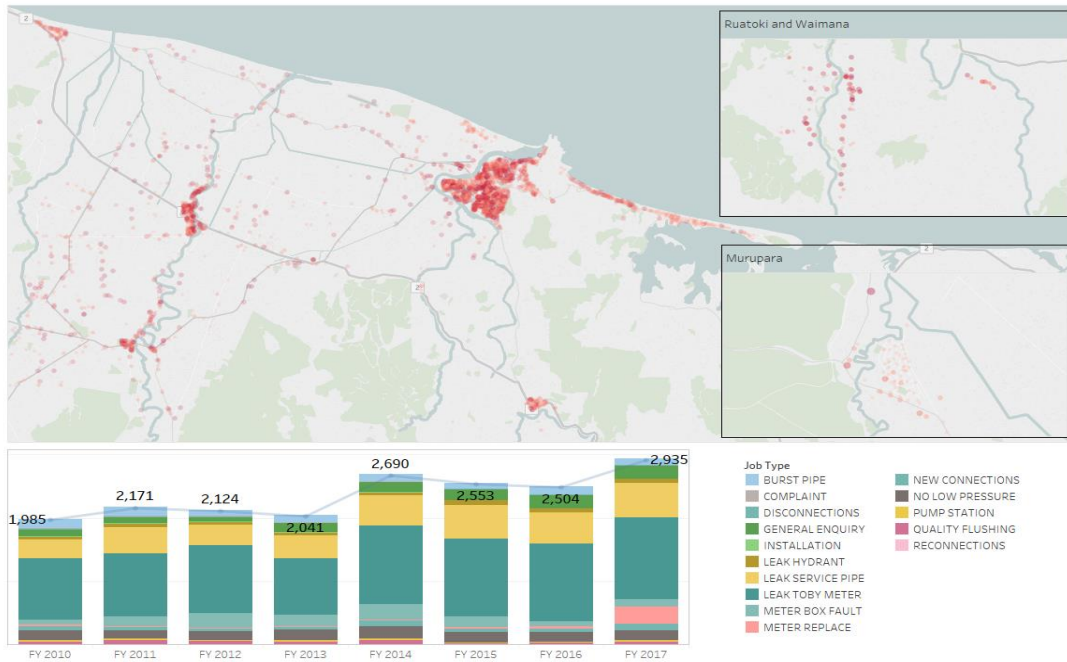


Figure 12 below shows all water supply RFS between 2010 when records began and 2017. The information is across the District and has been broken down into the various water supply

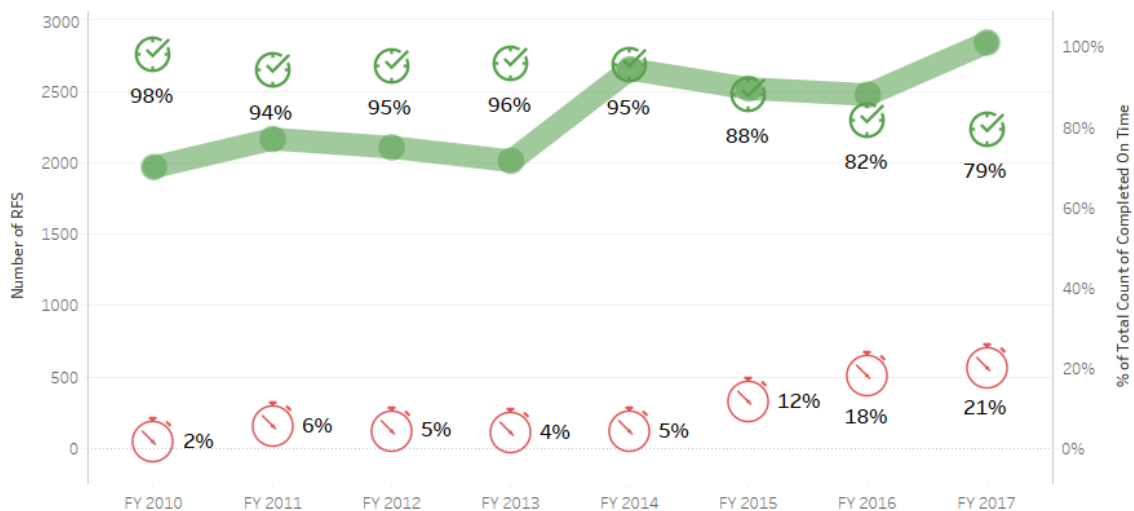
types of requests. As shown below in Figure 12, 68.38% of RFS were relative to water leaks with leakage at the toby/meter being the most common leakage.

**Figure 12: All RFS between 2010 and 2017**



The numbers of RFS between July 2009 and July 2017, and the percentage of resolved within the target timeframe are shown in Figure 13 below. The percentages of resolutions completed on time by the Council has been dropping since 2004.

**Figure 13: Number of RFS and Percentage Completed on Time**



#### 4.4 Performance Measures

Performance measures are used to indicate how an organization is delivering levels of service. The main performances that the Council aims to achieve on the water supply service are:

1. Provide safe and clean water to all properties within the District's water supply boundaries.
2. Provide a continuous, appropriate and safe water system throughout the District's urban, residential and commercial areas.
3. Provide incentives and opportunities for the community to reduce unnecessary consumption of water.

A further break down of these into either customer or technical performances are described as:

- Customer performance measure, which is the service the customer receives.
- Technical performance measure, which measures the service that the organization provides (and which may use technical indicators of performance such as the condition of the asset).

Table 14 below outlines the LoS Performance Measure for clean and safe water.

**Table 14: LoS Performance Measure – Safe and Clean**

Level of Service	Provide safe and clean water to all properties within the District's water boundaries.				
Customer Value	The core customer values this service aims to provide are: <ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Reliability</li> </ul>				
Customer Measures	(1) Safe drinking water - a) percentage of the time drinking water supply complies with part 4 of the drinking water standards for all of the specified supplies (bacteria compliance criteria)  (2) Safe drinking water - b) percentage of the time drinking water supply complies with part 5 of the drinking water standards for all of the specified supplies (protozoal compliance criteria). Resolution of urgent calls: from the time receiving the notification to the time that service personnel confirm service resolution of the fault or interruption is less than 10hrs  (3) Customer Satisfaction - Total number of complaints received per 1,000 connections by the Council about <ul style="list-style-type: none"> <li>a) drinking water clarity.</li> <li>b) drinking water taste.</li> <li>c) drinking water odour.</li> </ul> (4) Satisfaction within the water supply (annual survey results)				
Targets	Current Performance	Year 1 target 2018/19	Year 2 target 2019/20	Year 3 target 2020/21	Years 4-10 target 2021-28
(1)	94% for Whakatane / Ohope / Taneatua / Rūātoki / Waimana / Matata / Plains / Te Mahoe / Edgecumbe	90% for Whakatane / Ohope / Taneatua / Rūātoki / Waimana / Matata / Plains / Te Mahoe / Edgecumbe	90% for Whakatane / Ohope / Taneatua / Rūātoki / Waimana / Matata / Plains / Te Mahoe / Edgecumbe	90% for Whakatane / Ohope / Taneatua / Rūātoki / Waimana / Matata / Plains / Te Mahoe / Edgecumbe	90% for Whakatane / Ohope / Taneatua / Rūātoki / Waimana / Matata / Plains / Te Mahoe / Edgecumbe

(2)	Not Achieved.*	Same as Target 1	Same as Target 1	Same as Target 1	Same as Target 1
(3a)	1.6	30	30	30	30
(3b)	0.88	30	30	30	30
(3c)	0.48	30	30	30	30
(4)	87%	77-81%	77-81%	77-81%	77-81%
Technical Measures	(1) Appropriate treatment systems are maintained including UV treatment (2) Appropriate treatment systems are maintained including UV treatment <b>(3)</b> Implementation of scheduled planned maintenance programme including but not limited to mains flushing programme, regular water testing, complaints monitoring, pipe pigging etc.				
Targets	Current Performance	Year 1 target 2018/19	Year 2 target 2019/20	Year 3 target 2020/21	Years 4-10 target 2021-28
(1)	Appropriate treatment system is available including UV treatment except for Penetito and Murupara	Appropriate treatment system is available including UV treatment except for Penetito and Murupara	Appropriate treatment system is available including UV treatment except for Penetito and Murupara	Appropriate treatment system is available including UV treatment except for Penetito and Murupara	Appropriate treatment system is available including UV treatment except for Penetito and Murupara
(2)	Same as Target 1	Same as Target 1	Same as Target 1	Same as Target 1	Same as Target 1
(3)	70% of the scheduled maintenance programme is implemented	85% of the scheduled maintenance programme is implemented	85% of the scheduled maintenance programme is implemented	85% of the scheduled maintenance programme is implemented	85% of the scheduled maintenance programme is implemented
How we will achieve this Level of Service	(1) Compliance with scheduled operations and maintenance programmes (2) Maintaining operational information and data in AMS				
How we will measure if target is achieved	(1) Residents Perceptions Survey (2) Monthly reporting by Depot (3) Network Modelling (4) Monitoring of RFS from the Ozone System (Contact Centre) and reporting				

\* Refer to Annual Report 2016/17 page 52. The specified schemes did not receive UV treatment at all times (in large part due to the ex-cyclone events in April 2017).

Table 15 below outlines the LoS Performance Measure for continuous, appropriate and reliability.

**Table 15: LoS – Performance Measure – Continuous, Appropriate and Reliability**

Level of Service	Provide a continuous, appropriate and safe water system throughout the District's urban, residential and commercial areas				
Customer Value	The core customer value this service aims to provide is: <ul style="list-style-type: none"> <li>• Water quality and supply quality</li> <li>• Reliability</li> </ul>				
Customer Measures	(1) Maintenance of reticulation - Percentage of real water loss from our networked reticulation system (2) Fault response times <ul style="list-style-type: none"> <li>a) Median response time to attend urgent call-outs</li> <li>b) Median response time to resolve urgent call-outs</li> <li>c) Median response time to attend non-urgent call-outs</li> <li>d) Median response time to resolve non-urgent call-outs</li> </ul> (3) Customer Satisfaction - Total number of complaints received per 1000 connections by the Council about <ul style="list-style-type: none"> <li>a) drinking water pressure or flow</li> <li>b) continuity of supply</li> <li>c) the local authority's response to any of these issues</li> </ul> (4) Percentage of water supply systems (excluding Plains) with adequate flow and pressure for firefighting purposes for urban residential properties, as defined by the firefighting standards				
Targets	Current Performance	Year 1 target 2018/19	Year 2 target 2019/20	Year 3 target 2020/21	Years 4-10 target 2021-28
(1)	25%	Metered schemes 20%	Metered schemes 20%	Metered schemes 20%	Metered schemes 20%
	49.4%	Unmetered schemes 50%	Unmetered schemes 50%	Unmetered schemes 50%	Unmetered schemes 50%
(2) a	76%	80% < 1 hour	80% < 1 hour	80% < 1 hour	80% < 1 hour
(2) b	81%	80% < 10 hours	80% < 10 hours	80% < 10 hours	80% < 10 hours
(2) c	85%	80% < 4 days	80% < 4 days	80% < 4 days	80% < 4 days
(2) d	82%	80% < 5 days	80% < 5 days	80% < 5 days	80% < 5 days
(3) a	3.19	50	50	50	50
(3) b	9.5	50	50	50	50
(3) c	2.63	2	2	2	2
(4)	99.82% **	90%	90%	90%	90%
Technical Measures	1) Implementation of planned operations and maintenance programme 2) Implementation of identified capital works programme				

Targets	Current Performance	Year 1 target 2018/19	Year 2 target 2019/20	Year 3 target 2020/21	Years 4-10 target 2021-28
(1)	95% compliance	100% compliance	100% compliance	100% compliance	100% compliance
(2)	100% compliance	100% compliance	100% compliance	100% compliance	100% compliance
How we will achieve this Level of Service	(1) Work scheduling through AMS (2) Implementation of capital works programme in LTP				

\*\*Data available only for the Whakatāne Scheme

Table 16 below outlines the LoS Performance Measure – Sustainability.

**Table 16: LoS Performance Measures - Sustainability**

**4.5 Gaps**

<b>Level of Service</b>	<b>Provide incentives and opportunities for the community to reduce unnecessary consumption of water</b>				
<b>Customer Value</b>	<b>The core customer values this service aims to provide are:</b> <ul style="list-style-type: none"> <li>► <b>Sustainability</b></li> </ul>				
<b>Customer Measures</b>	<b>(1) Average consumption of drinking water per day per resident in the District</b>				
<b>Targets</b>	Current Performance	Year 1 target 2018/19	Year 2 target 2019/20	Year 3 target 2020/21	Years 4-10 target 2021-28
<b>(1)</b>	240	280 litres per day for metered areas	280 litres per day for metered areas	280 litres per day for metered areas	280 litres per day for metered areas
	300.7	450 litres per day for unmetered areas	450 litres per day for unmetered areas	450 litres per day for unmetered areas	450 litres per day for unmetered areas
<b>Technical Measures</b>	<b>(1) Water conservation strategy (to be developed)</b> <b>(2) Leak detection and repairs programme (to be developed)</b>				
<b>Targets</b>	Current Performance	Year 1 target 2018/19	Year 2 target 2019/20	Year 3 target 2020/21	Years 4-10 target 2021-28
<b>(1)</b>	Nil	Water conservation strategy investigation	Water conservation strategy development for all schemes	Water conservation strategy development for all schemes	Water conservation strategy implementation for all schemes
<b>(2)</b>	0%	10% complete	20% complete	20% complete	80% complete
<b>How we will achieve this Level of Service</b>	Implementing above technical measures				
<b>How we will measure if target is achieved</b>	Monitoring of water production and consumption through meters and bulk meters				
<b>How we will measure if target is achieved</b>	(1) Compliance reports from treatment plants (2) Compliance reports from Drinking Water Assessor (3) Monthly and annual reporting by the Depot (4) AMS reports				

The performance targets in this AMP are established to maintain LoS in some locations while some growth is expected in Whakatāne and Ōhope. Customer research and the Council's service records indicate that there remains a level of dissatisfaction with water supply service in areas of some schemes. Past reports indicate that the problem of leakages has risen in the last few years. The national drinking water standards have higher requirements on the water treatments/quality. Together these issues will require further Council investment.

The key issues are listed as below:

- Insufficient water supplies during times of drought or emergency.
- Although the Infrastructure Leakage Index in Whakatāne and Ōhope is low, high water pressure within these schemes increases the leakage throughout the networks and due to terrain, some areas experience inadequate pressures and flow to meet firefighting standards.
- Pressure management: use of PRV's, zone metering management and network modelling are all tools the Council is considering utilising.
- Leakage on the customer side indicates the effect of high water pressure in Whakatāne and Ōhope. (**Appendix 2**)
- The cost of desired infrastructure improvements may exceed the community's ability to pay.
- Water leaks have increased over the past few years with 29.5% of the water being non-revenue water in the latest water balance report. The infrastructure Leakage Index in some schemes is high and increasing every year. Further details are shown in Table 18 and **Appendix 1**.
- Lack of asset information and data hinders the decision making process.
- Ageing water assets require good asset management practices.
- Water sources are not secured with regard to resilience and further work on water plant upgrades. Investigation of alternative water sources for security of supply needs to be undertaken with only the Plains water supply having multiple interconnected water sources.
- The effects of natural disasters may cause widespread damage to the water supply network and generally will require reactive solutions to be adopted at times of increased stress levels to the water supply.
- Lack of effective monitoring across the reticulation network.

#### 4.6 **Future**

The purpose of good asset management is to provide the desired levels of service through the management of assets in the most cost-effect manner for existing and future customers.

Although some LoS will be determined by legislation, community consultation is most important in establishing levels of service. Typically, water supply assets have long lives and the Council has to consider the sustainability of these assets into the future. Decisions made



today will have an effect on future customers and today's customers may be future customers. The use of the Annual Residents' Survey provides useful data on customer expectations and their perceptions of the Council and its activities.

The Council is currently building a data collection and integration system to help in the asset management decision-making process. This system will have the data for the water supply system all in one place. This data will include asset information, water pressures at certain points, water production data, RFS's for three waters, etc.

## 5 Growth and Demand

Part A of the AMP outlines the growth projections for the District. Planning for future growth and demand is imperative to provide an economically sustained pathway in meeting the needs of residents, businesses and visitors to the District. The provision of the water supply activity and its management is an essential element in the planning process.

The Council is currently preparing a Growth Strategy and once completed, this will give direction regarding growth and demand effects. It is anticipated that the major growth areas will be in the Whakatāne and Ōhope townships, which are likely to require upgrades to water supply infrastructure.

The key demand drivers relevant to the water supply activity include:

- Population and Development Considerations
- Community Expectations, Drinking Water Standards
- Any proposed changes arising out of the Havelock North incident
- Climate Change
- Public and Environmental Health
- Legislation.

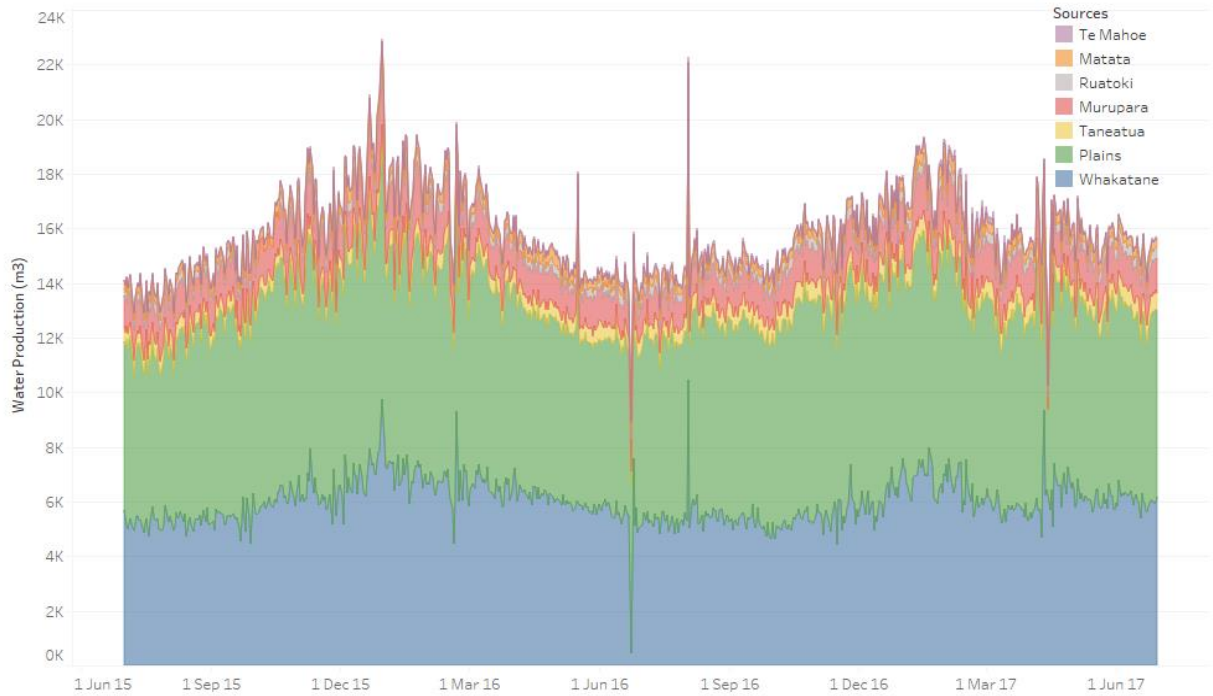
The main impacts are likely to include:

- Increased pressure on existing infrastructure due to increased water consumption
- Increased pressure on existing infrastructure due to climate change (more extreme hot weather)
- A requirement for robust asset data and network modelling to assist in network monitoring and decision making
- An increase in the assets vested in the Council
- Increased maintenance, operations and depreciation costs to residents
- An increase need to maximise funding potential.

### 5.1 Water Consumption

Figure 14 below illustrates the water production for all schemes in the last two years. Generally, water production peaks in summer with an increase of about 30%, compared to low water consumption during the winter months.

**Figure 14: Water Production 2015/16 and 2016/17**



## 5.2 Population and Development Considerations

### 5.2.1 Population Trends

The Whakatāne District consists of a number of urban communities that vary in population. The predicted population trends show a static population with a population decline after 2030. However, this decline is unlikely to be uniform across the District because some areas are expected to grow, primarily within Whakatāne and Ōhope. Although decline is expected in some rural areas, population decline does not necessarily translate into a decline in water supply demand.

### 5.2.2 Tourism

Whakatāne is a popular tourist destination. During the summer months tourists flock to the coastal areas of Whakatāne, particularly the townships of Ōhope, Whakatāne and Matatā. The demand on water infrastructure increases over this period, coinciding with the seasonal fluctuations that are generally experienced over summer period. This adds additional burden onto the available storage in these schemes as peak demand increases dramatically. To assist with this additional demand, a new water reservoir of 130m<sup>3</sup> capacity was constructed and commissioned within the Matatā scheme. Modelling indicates that the existing water treatment plant and pipe network within the Whakatāne and Ōhope water supply schemes are adequate to meet this peak summer demand but investigations are planned to review the Whakatāne reservoir capacities.

### 5.2.3 **Residential Development**

In addition to the potential development of residential areas, there is pressure to redevelop the Whakatāne harbour land including reclaimed land (around the Strand area and river flat marshland) for residential use, possibly in the form of apartment buildings.

The growth in future urban areas such as Shaw Road and Huna Road will require additional infrastructure alongside the currently limited infrastructure.

Within the Whakatāne urban area, the reticulated water supply has been built to accommodate infill development for the next 10 to 15 years (dependant on demand for fire flow) without the need of constructing additional major infrastructure. However, if growth exceeds expectations then additional infrastructure will be required. Any additional treatment plant capacity will be taken up by this infill development and additional operational and maintenance costs will occur in order to deliver an increased treated water capacity over the summer months.

One of the major factors affecting the treatment capabilities is that water extracted from Whakatāne River is effected by the tidal seawater. As a result, salinity is an issue during high and king tides with the combination of low water river flows. The Council is investigating cost effective solutions and has scheduled a capital project to address this problem.

### 5.2.4 **Impacts on the Water Supply Activity**

The primary water supplies within the District are Whakatāne, Ōhope, Edgecumbe, Murupara and Plains schemes. The main growth and demand effects are expected to occur in Whakatāne and Ōhope where there will be upgrades/additional infrastructure due to residential growth and to meet expected levels of service. Matatā and the Plains will also have some increases mainly due to the increasing number of lifestyle lots.

The main issues across the District are related to the security of the water sources, interconnection of water supplies for resilience and inadequacies in water storage capacities.

The majority of communities have signalled their support for meeting the Drinking Water Standards 2005 (Revised 2008) Requirements but there are some minority communities who have indicated they don't want to change. This poses challenges for the Council to deliver future works and upgrade schemes to an acceptable level.

The Council has undertaken a Growth Management Strategy 2010 and the predicted impact on the water activity by each of the growth areas is shown in Table 17 below.

**Table 17: Impact on the Water Supply by Growth Area**

Area	Impact on Water Activity
Kopeopeo Intensification (Whakatāne Scheme)	Additional storage may be required depending on redevelopment uptake. Upgrading of treatment plant may require after 15 years.
Whakatāne Town Centre Mixed Use (Whakatāne Scheme)	Upgrading of treatment plant may require after 15 years.

Infill in the Urban Area (Whakatāne Scheme)	Upgrading of treatment plant may require after 15 years.
Coastlands - Piripai (Whakatāne Scheme)	Existing reticulation system has been upgraded. Extension and link main to the existing water reticulation required.
Port Ohope (Ōhope Scheme)	Extension/upgrades required to/from Ōhope reticulation.
Hillcrest Extension (Whakatāne Scheme)	No significant issues other than extension to existing water lines and additional storage.
Shaw Road and Huna Road area development (Whakatāne Scheme)	Extension to the existing water reticulation required. Additional storage required with uptake of future urban area.

The increasing age of the population and the index of socioeconomic deprivation within the Whakatāne district could inhibit the ability of people to pay for services and could mean that the community prefers a reduced level of service in order to save money. This could ultimately reduce demand for services and would have a large impact on future generations for the water supply services. It is intended to implement a programme of water supply metering across the District which is initially likely to reduce water demand as residents start to manage their onsite water consumption.

#### 5.2.5 **Management Strategies**

Water supply activity will be managed by the ongoing monitoring of population trends, residential, commercial and industrial growth; and where appropriate by calculating and imposing development contributions that take account of the impact of any new development on the infrastructure. Land use management is typically managed through land use zoning within the District Plan. This determines growth capacities and places conditions or restrictions on the development.

As the population of the District grows along with increased tourism demand, particularly in Whakatāne/Ōhope, the Council will look at opportunities to meet demand. Opportunities that could be considered include encouraging water harvesting (rainwater tanks) and recycled water options that treat grey water. If adopted, these would reduce the reliance on precious potable water being used for activities such as watering the garden, flushing toilets, washing cars, firefighting etc. Further opportunities would include working closely with building regulators to impose the installation of water saving devices, such dual flush toilets, low flow shower heads, installation of rainwater tanks, dual water systems, etc. on alterations or new buildings.

Network modelling and data capture can be used to reconcile the accuracy of asset data as well as identifying the condition of the assets and capacity issues to allow timely upgrades and renewals. This information will be used in business intelligence to assist the decision-making.

Some works have already been undertaken to analysis the growth and demand in the Council's water supply system including:

## I. Network Modelling

The Council has undertaken network modelling across many schemes in the District to highlight the effects of growth and to identify deficiencies in the networks. The majority of the water modelling undertaken has been on isolated projects that have the best available asset data. These were for the Whakatāne/Ōhope, Edgecumbe, Rūātoki and Plains/Awakeri schemes. Details and recommendations for various strategies as a result of the modelling projects are:

- The Council's Whakatāne Water Upgrade Strategy (2008)
- Leakage and unaccounted for water
- Water Treatment Plant (WTP) and pump stations sufficient for normal and peak demands
- Reticulation suitable supply for next 10-15 years with works required for the new developments in Huna and Shaw Road areas and the Piripai block
- High pressures across the District responsible for leakage (pressure zones being developed)
- Whakatāne West has inadequately sized pipes and unregulated commercial demand, classification is currently semi-rural.

Recommended improvements include:

- Development of growth areas in Coastlands and Ōhope
- Leakage control and economic level of leakage strategy
- Validation of growth projections.

## II. Plains Water Supply 50 Years Strategy

This is an un-adopted strategy report for the Plains water supply scheme. The following aspects of the scheme have been investigated:

- Investigation and installation of the Otumahi water supply which is located at Paul Road and connects to the Plains water scheme and to Edgecumbe
- Looking at upgrading and extension options of the existing pipe network
- Looking at customer service levels and investigating redefining the service boundary level to 15 metre contour level
- Providing resilience for Whakatāne township with either emergency (limited) or full alternative supply to Whakatāne.

## III. Water Balance Report

The Council generated the first Water Balance Report in 2013/2014 and repeated it in 2015/2016, 2016/2017 and 2017/2018 financial years.

The International Water Association (IWA) provides a water balance calculation that gives guidance in estimating how much is lost as leakage from the network (physical losses), and how much is due to non-physical losses. Furthermore, the IWA has

established the Infrastructure Leakage Index (ILI), a performance indicator for comparisons of leakage management in water supply systems. This is a ratio of Annual Real Losses and Unavoidable Losses, these water balance reports are in Table 18 below. Further details of the leakage information in each scheme is in **Appendix 2**.

**Table 18: Infrastructure Leakage Index of each scheme**

Scheme	Infrastructure Leakage Index			
	2013/2014	2015/2016	2016/2017	2017/2018
Whakatāne& Ōhope	1.40	1.58	1.42	2.02
Rangitāiki Plains	5.00	6.14	6.97	9.32
Matatā	3.40	3.27	3.82	4.93
Rūātoki	7.80	2.32	2.00	6.21
Edgecumbe	6.40	3.48	3.10*	3.10**
Murupara	16.40	15.11	14.05	14.13
Tāneatua	15.00	14.11	17.45	19.13
Waimana	3.40	3.99	5.27	12.2
Te Mahoe	4.50	12.17	21.16	9.84
Combined systems	3.50	3.50	3.64	4.71

\* Edgecumbe data is less reliable for 2016/2017 due to decreasing consumption as displaced population resulting from the April 2017 flooding event.

\* Edgecumbe data for 2017/2018 was included in Rangitāiki Plains due to introduction of water meters

The schemes that are currently unmetered (Murupara, Tāneatua and Te Mahoe) show the highest ILI due to the use of average assumed water consumption. The Council is planning to install water meters on all connections to better understand leakage issues and to actively undertake a leak detection program across the schemes. The Plains water scheme also has a high ILI, which is on the rise. It appears the leakage is largely due to the water production volume. Due to the low connection density within the Plains scheme and the extensive water network past large rural properties, there is debate as to whether it will be cost effective to carry out an intensive leak detention program. Because the Council is keen to reduce the leaks, it will develop a targeted approach within this scheme.

The key to managing leaks is through proactive leak detention and repairs. The Council is employing tools such as network modelling, zone meter installations, network pressure monitoring, business intelligent system and pressure management to assist to address this problem.

### 5.3 **Community Expectations, Drinking Water Standards, the Health Act 1956 and the Health (Drinking Water) Amendment Act 2013**

#### 5.3.1 ***Desirable Levels of Service***

Through the LTP consultation and customer feedback processes, the community has identified the following main outcomes they want to see related to water supply:

- Clean protected environment
- Environmentally responsible development
- High-quality affordable infrastructure
- Healthy people and quality housing.

Information has been gained from customers regarding their expectations on the effectiveness of the delivery and the costs associated with water supply services. This information is collected via a number of mechanisms including:

- Customer Survey
- Submissions on the Annual Plan (AP) and Long Term Plan (LTP)
- Analysis of customer calls
- Community consultation
- Analysis of facilities use.

A recent Customer Survey shows customers are less satisfied with water supply quality compared to the overall water supply service at 72% and 87% (Figure 10). Most of the complaints relate to the taste and the colour of the water.

Additionally, after community consultation in 2017, the community in Murupara clearly indicated that they do not want any disinfection of the water supply.

Balancing community expectations with what the community are able/happy to pay for and with the imbalance of wealth will be challenging for Council.

#### 5.3.2 ***Drinking Water Standards, the Health Act and Health (Drinking Water) Amendment Act 2013***

Drinking-water Standards for New Zealand 2005 (Revised 2008) came into effect on 31 December 2008. The objective of the standard is “to ensure all New Zealanders have access to good quality drinking water.”

In October 2007, the Ministry of Health enacted the Health (Drinking Water) Amendment Act 2007. The Act makes it compulsory for all water suppliers to take “all practicable steps” to comply with the new Drinking-water Standards (2005). The Council has undertaken a significant amount of works to meet these standards where possible.

Under the this legislation, there is a requirement that Water Safety Plans (WSP) are a mandatory document for water supplies serving more than 500 people. Council is developing appropriate WSPs for approval by Toi Te Ora Public Health in 2019 to comply with the legislation.



### 5.3.3 ***Impacts on the Water Supply Activity***

The LTP is the key document that the Council and the community have in terms of defining what projects with regards to water supply activity are planned by the Council and when they will be undertaken. The Council strives to achieve a balance between economic development and the community's expectation for neutral effects on the natural environment.

Community expectations are related to the delivery and overall quality of the water supply service. A harmonious relationship between these expectations and service delivery can alleviate issues at critical planning stages.

One of the key issues for the Council is the gap between the community's expectations of water supply service delivery and the community's ability/willingness to pay. This is further exacerbated by the different levels of affluence between the townships and schemes, with the more affluent areas generally having higher expectations.

### 5.3.4 ***Management Strategy***

The Council and community have identified the following management requirements to be achieved:

- Decision making processes shall be transparent, open and inclusive.
- The Council, the community and Maori to work in partnership.
- Development strategies are developed for guiding infrastructure planning.

Ongoing investigations e.g. network modelling, routine maintenance, funding applications, continued communication together with consultation with the local residents etc., are all tools that can be combined to align community expectations with levels of service.

## 5.4 **Climate Change**

The March 2004 amendments to the RMA require all Councils to consider the effects of climate change. This is backed by conclusive evidence both nationally and internationally that the climate is changing, resulting in rising sea levels, increased weather extremes, such as "weather bombs" (increased frequency of El Nino conditions). As a result, there will be more storms, intense rainfall events, flooding, and drought, all of which will influence river and seawater quality and quantity and how the community interacts with the physical environment.

Traditionally, the District has been the sunniest place in the country. However, past reviews of the effect of climate change on the Bay of Plenty coastline (NIWA 2006) confirm that climatic variation could influence storm intensity. This variation may affect water supplies that are vulnerable to storm events and increases in turbidity.

### 5.4.1 ***Impacts on the Water Supply Activity***

The District's water supplies are via river systems, bores and natural springs. Resource consents are in place to guide water usage throughout the region and to restrict water usage during extended dry periods. Planning for drought conditions is a driver for potential

alternative supplies and growth in the network. Saline water intrusion into the Whakatāne WTP intake is an issue experienced during prolonged dry periods when the river flow is low.

Rising sea levels will limit growth along the coastal regions due to potential flooding and erosion, placing development pressure on inland areas and existing infrastructure. Table 19 below provides an overview of the potential effects of climate change.

**Table 19: Potential Effects of Climate Change**

<b>Rising Sea Level</b>	Coastal development, in the long-term will need to take into account rising sea level and the potential for coastal flooding and erosion.
<b>Extreme weather</b>	Potential contamination of natural water sources
<b>Drought</b>	Water use restrictions and reviewing alternative supplies to enhance security of supply and to protect the environment e.g. river systems and saline water intrusion into Whakatāne treatment plant is an issue.

The main effects of climate change on water supply activity are:

- Increased water scarcity
- Potential impacts on groundwater quality and quantity
- Saline water intrusion into Whakatāne treatment plant
- Effects on surface water quality from increased runoff during rainfall events and unrestricted activities within catchment areas
- Potential damage to structures during extreme events.

#### 5.4.2 **Management Strategies**

Climate change and its related impacts cannot be avoided. Therefore, factoring in future climate change events is an essential task for the Council with regard to long-term land use planning, hazard mapping, Civil Defence planning and determining the infrastructure requirements moving forward to ensure communities' expectations are met with regard to well-being for all and safe and reliable services. Management strategies include:

- The Council will monitor trends in Climate Change and where required, review the Engineering Standards and Guidelines to better cater for drought scenarios and flooding events.
- A water strategy report has been prepared for Whakatāne, Ōhope and Plains. According to the report, one option to address water issues due to weather and climate change is to provide emergency water from Otumahi water source at Paul Road within the Plains scheme. This option is considered expensive and at present the Council is investigating other options including new water sources closer to WTP.
- Liaise with Central and Regional government.
- Redefine Hazard Zones (i.e. the Council's boundaries with waterways and the coastal boundary).
- Long-term planning for low-lying communities (coastal, inner harbour, river, stream etc.) and infrastructure requirements as a result of increased rainfall.

- The Council is in the process of preparing a Water Conservation Strategy which would incorporate water demand management (which includes education of the community on water conservation; peak water pricing, and water metering).

## 5.5 Public & Environmental Health

Urbanisation and increasing population densities lead to an increased requirement for water services. This results in added demand for water collection and pressure on the existing infrastructure.

Potable water supplies are necessary to protect public health and safety from a fire fighting perspective, and through the eradication of water borne diseases. In addition, the preservation of water quality for amenity, cultural, social, environmental and economic values is seen as paramount.

### 5.5.1 *Impacts on the Water Supply Activity*

The Council has individual Catchment Risk Assessments for each water scheme that assess any potential and/or perceived microbiological risks to the surface water or groundwater catchment and recommend the treatment required for Protozoa removal in the form of log credit. These catchment risk assessments look at all activities within the catchment including developments, water takes, horticultural activities, pesticide applications, etc. All risks are assessed and mitigation plans need to be established to ensure the safety of the water supply. In extreme situations in the water, supply has been compromised, Council may need to issue “Boil Water Notices” to all affected customers.

### 5.5.2 *Management Strategies*

- Growth and demand must be carefully monitored with planning undertaken to control the potential situation. System capacity upgrades should be prioritised.
- The Council is updating Water Safety Plans for all the water supply schemes. These are expected to be finalised and approved by Ministry of Health’s Drinking Water Assessor in 2019.
- The Council is reviewing a developer contribution policy that may require developers who place increased demand on the infrastructure to make a contribution towards upgrading the existing infrastructure.
- New developments must meet and/or exceed Council Engineering Standards with resource consents.
- Residents without reticulated supply are educated around care and maintenance of their supplies.
- Where feasible, residents can be connected to public supplies.
- Specify rules around land use around water supply sources.

## 5.6 Legislation

There are a number of key regulations and legislation that impact on the water supply activity, its management, renewal, repairs, upgrades and impacts. The key legislation is

discussed in more detail in Section 3.1 [Legislative Framework](#). A summary of the key regulations and legislation is outlined below.

In addition to national legislation and guidelines, the Whakatane District Plan provides rules that apply to subdivisions and land use consents. It also relates to development in conjunction (where necessary) with the rules in the Regional Soil and Water Plan for the Bay of Plenty, administered by Environment Bay of Plenty for purposes of controlling discharges to the environment.

Legislative change can significantly affect the Council's ability to meet minimum levels of service that have been agreed with the community, and may require improvements to infrastructure assets. This will affect the community if increased levels of service affect the community's ability to pay for services.

The Council needs to be able to identify growth and demand needs over a long period of time. This requires robust knowledge of the network, past performance, network modelling and future growth strategies and policies.

A robust Development Contributions Policy also needs to be in place that will accurately capture funding from developers to take into account the cost of additional infrastructure that will be required as a result of new developments.

#### 5.6.1 **Management Strategies**

The Council will ensure it is compliant with the relevant legislative requirements related to the water activity. This includes environmental performance and governance through the implementation and continuous improvement of this AMP. The Council will involve the community to far greater levels than in the past through consultation and decision-making and will implement the following:

- Ensure key staff have an adequate understanding of the legislation
- Carry out reviews of policy changes to establish what the impacts may be, if any
- Ensure compliance with consent conditions (where relevant)
- Develop a Community Consultation Strategy
- Promote the preparation, mitigation and response aspects in compliance with the CDEM 2002
- Remain involved with the Lifelines technical forums
- Develop the District Wide Strategic Plan.

#### 5.7 **Demand Management Planning**

The objective of demand management planning is to actively educate and seek to modify customer demand for services so the Council can maximise the utilisation of existing assets and/or reduce and/or defer the need for construction of new assets. The use of demand modelling tools is essential for future scenario planning. Examples of new and improved services to meet customer demand include:

- Environmental controls
- Environmentally sensitive design

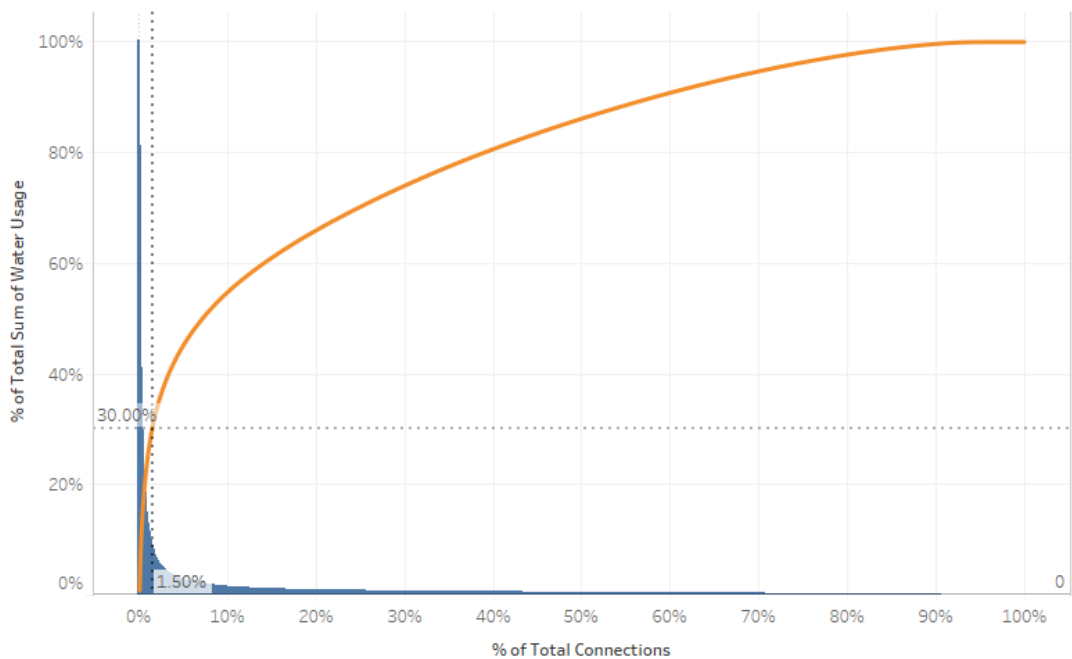
- Developing use of non-potable water supplies
- Research of alternatives to ‘hard’ engineering options
- Use of GIS to maintain up-to-date details of the water supply network
- Investigation into non-asset solutions.

**5.7.1 Management Strategies**

Demand management strategies provide alternatives to the creation of new assets in order to meet demand. These strategies look at ways to modify customer demand in order to maximise the utilisation of existing assets and reduce and/or defer the need for new assets.

An example is metered water usage, where 1.5% of the users have consumed 30% of the metered water in the last 10 years. This is displayed in the Pareto Chart shown in Figure 15 below. Working with these large consumers is an effective way to manage the water consumption.

**Figure 15: User Water Consumption Pareto Chart**



Demand management is practiced continuously to maintain total demand at reasonable and sustainable levels. The five key components of demand management when promoted together as a package or strategy rather than in isolation, can dramatically reduce demand on the network.

The key components with examples are shown in Table 20 below.

**Table 20: Demand Management Strategies**

Demand Component	Water Examples
Legislation/ Regulation	<ul style="list-style-type: none"> <li>▶ Development of Water Management Plans</li> <li>▶ Compliance with resource consents</li> </ul>
Education	<ul style="list-style-type: none"> <li>▶ Education on water conservation</li> <li>▶ Demonstrate savings to be made from minimising potable water consumption</li> </ul>
Incentives	<ul style="list-style-type: none"> <li>▶ Provide incentives for the use of non-potable water sources</li> <li>▶ Water metering and pricing i.e. Peak water demand management pricing system</li> </ul>
Operation	<ul style="list-style-type: none"> <li>▶ Identification of restricted activity areas to maintain security of supply</li> <li>▶ Leakage control, detection and repairs</li> <li>▶ Controlling supply pressure (e.g. PRV's)</li> <li>▶ Works programmes for renewals, upgrades and new works</li> <li>▶ Pressure Management pilot study</li> </ul>
Demand Substitution	<ul style="list-style-type: none"> <li>▶ Promote stormwater use for gardens, provide water reuse alternatives in new builds</li> </ul>

In addition, new technologies can be effective in reducing the impacts of growth and demand and the associated costs, such as:

- New materials become available which provide for a longer life of the assets
- New and enhanced construction/rehabilitation methods can deliver cost savings for renewal projects as well as time savings
- New treatment systems can achieve high quality water discharged to rivers and streams at reasonable costs.

## 6 Lifecycle Management

The Lifecycle Management section outlines the broad strategies and work programmes required to achieve the goals and objectives set out in previous sections of this plan. This section provides guidance on decision techniques that aim to provide the most effective solution to delivering defined objectives.

The lifecycle decision methods are described in Part A of this asset management plan. The water supply system lifecycle decisions make use of methods that balance performance, risk and cost, which is a principle of ISO 55001. Table 21 below shows the criteria applied to lifecycle management decisions.

**Table 21: Lifecycle Management Decision Criteria**

	<i>Decision Criteria</i>
<i>Performance</i>	Community satisfaction, asset output, Levels of Services, etc.
<i>Risk</i>	Risk to the asset user, risk of failure, risk of service interruption, safety risk, reputation, etc.
<i>Cost</i>	Cost of ownership, operations and maintenance cost, financial return, net present value, etc.

### 6.1 Lifecycle Management – Background Data

Further to the asset information, as described in Section 2 of this asset management plan include key information shown in Table 22 below:

**Table 22: Asset Information**

Asset Type	Unit	Quantities	ORC (\$)
Reservoirs	Each	42	\$7,567,083
Trunk Mains	Metres	287,929	\$63,373,953
Mains	Metres	255,918	\$24,015,131
Service Line	Metres	13,126	\$12,089,831
Pump Station	Each	17	\$4,321,246
Resource Consent	Each	11	\$83,542
Treatment Plant	Each	9	\$7,495,731

### 6.2 Lifecycle Management – Managing Risk

Part A of the AMP details the Council’s approach to risk management. This section covers the specific risk management activities implemented by the Council and how these apply to the current and future water supply activities.

The objective of risk management is to identify the specific business risks, together with any possible risks to the health and safety of employees, other contractors the travelling and general public, and associated with the ownership and management of the water assets. This

can be used to determine the direct and indirect costs associated with these risks and form a priority-based action plan to address them.

### 6.2.1 **Key Risks**

A key issue for the District is to understand the nature and possible consequences of the risks posed by hazards and ensure these risks are managed to acceptable levels. The Council has highlighted a number of key risk areas across the activity including:

- Insufficient water supplies during times of drought or emergency.
- The cost of desired infrastructure improvements may exceed the community's ability to pay.
- Water leakage is high across the District.
- Drinking water quality does not meet Drinking Water Standards.
- Lack of asset information and data hinders the decision making process.
- Some assets are aging and need replacement.
- Water sources are not secured with regard to resilience and further work on water plant upgrades. An investigation into alternative water sources for security of supply needs to be undertaken as only the Plains water supply has multiple interconnected water sources.
- The effects of natural disasters may cause widespread damage to the water supply network and will require reactive solutions to be adopted at times of increased stress levels of the water supply.
- Potential delivery of contaminated water caused by the Council and/or the public.
- Lack of effective monitoring across the reticulation network.

These are discussed in further detail in the Risk Registers and the overall Action Plan contained in this Section of the AMP.



## 6.2.2 Risk Register

The risk registers provided in Tables 23 and 24 for the current and future water supply activities of the Council have been developed in consultation with key staff and the network manager. The risk factors in the risk register were evaluated by the methods described in Part A of the Asset Management Plan.

**Table 23: Asset Management Risks - General**

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)			Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
WATO 1	Lack of resources – the ability to attract key staff and or retain skilled staff.	Operational Financial	4	4	▶ 16	<ul style="list-style-type: none"> <li>▶ District promotion (lifestyle)</li> <li>▶ Dedicated HR staff</li> <li>▶ Recruitment consultancy used (senior staff)</li> <li>▶ Benchmarked salary levels (confirm with HR).</li> </ul>	Good	4	2	8	<ul style="list-style-type: none"> <li>▶ HR Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ General Manager Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>▶ Look at review of recruitment policy (current lack of policies) Family/Lifestyle friendly policies</li> <li>▶ Look at improving Career development. Draft policy/programme needs completing?</li> <li>▶ Review salary levels and incentives</li> <li>▶ Implement the Performance Development system ASAP</li> </ul>	
WATO 2	Knowledge management – inability to retain knowledge or have sufficient systems in place to manage data/information, especially regarding asset performance and condition. Loss of institutional knowledge. IT failure.	Financial Operational	4	4	▶ 16	<ul style="list-style-type: none"> <li>▶ Asset changes/updates – Information currently provided by contractors</li> <li>▶ Condition surveys undertaken</li> <li>▶ IT practices (backup, virus, security etc.)</li> <li>▶ Asset management systems (e.g. Xivic)</li> <li>▶ Responsibilities defined</li> </ul>	Good	4	3	12	<ul style="list-style-type: none"> <li>▶ HR Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ General Manager Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop a process to ensure that knowledge is transferred, stored and accessible. Define champions and successors.</li> <li>▶ Suitable training for staff</li> <li>▶ Protocols for update and on-going auditing</li> <li>▶ Customisation of Asset Management systems to meet needs</li> <li>▶ Development of Staff Retention Policy</li> </ul>	

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)	Effectiveness	Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor			Consequence	Likelihood	Factor		
WATO 3	Project Management – projects inadequately scoped, budgeted, managed and documented, and reviewed, inadequate consultation with owners, resource consent issues etc. resulting in time & cost, loss of image and other impacts.	Operational Financial Reputation/ Image Health and Safety	4	4	16	<ul style="list-style-type: none"> <li>Project Management Training for key staff</li> <li>Dedicated in-house Project Management Team for larger projects with a dedicated capital Works Manager</li> <li>Annual Plan/LTP Process (is the initial consultation)</li> <li>Use of trained external resource</li> <li>Have access to internal specialists</li> <li>Media Communication Plan</li> <li>Appropriate resources (e.g. software/information systems)</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>HR Manager</li> <li>Three Waters Assets and Planning Manager</li> <li>General Manager Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Ensure adequate (quality) training for key staff</li> <li>Initial project information better communicated</li> <li>Project Closure/Reviews improved</li> <li>Define accountabilities and mapping organisation wide impacts and priorities</li> <li>Implement MCA process for CAPEX projects above \$20,000</li> </ul>
WATO 4	Maintenance and Operations Management – formalise of Operations and Maintenance procedures to reduce unnecessary or excessive costs and/or insufficient output or quality.	Operational Financial Reputation/ Image Health and Safety	4	4	16	<ul style="list-style-type: none"> <li>Maintenance Contracts</li> <li>Financial reporting</li> <li>Maintenance and Operations Procedure Manuals</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>Three Waters Operational Manager</li> <li>Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>Further improve Auditing and Reporting (including performance)</li> </ul>
WATO 5	Capital Works Management – formalise of contract management procedures to reduce unnecessary or excessive costs and/or insufficient output or quality. Poor Contractor performance.	Operational Financial Reputation/ Image Health and Safety	4	4	16	<ul style="list-style-type: none"> <li>Standard Capital Works Contracts</li> <li>Approved design and specifications</li> <li>Contract procurement process</li> <li>Contract conditions (KPI's, penalties)</li> <li>Financial reporting</li> </ul>	Good	3	3	9	<ul style="list-style-type: none"> <li>General Manager Infrastructure</li> <li>Project Delivery Manager</li> <li>Three Waters Assets and Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>Further improve Auditing and Reporting (including performance)</li> <li>Contract review and improvement</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)	Effectiveness	Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequenc	Likelihood	Factor			Consequenc	Likelihood	Factor		
WATO 6	Asset Management – not up to date, or insufficient quality of process and output.	Operational Legislative Financial	4	3	12	<ul style="list-style-type: none"> <li>▶ Asset Management processes and practices</li> <li>▶ Asset Management Plan - Improvement Plan being undertaken</li> <li>▶ Asset Management System Implementation</li> <li>▶ Improve Data Capture processes</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Asset Management Plan - Improvement Plan</li> <li>▶ Continuing Staff Development</li> <li>▶ On-going budget provision</li> <li>▶ Increase IT resources</li> </ul>
WATO 7	Inadequate condition/performance assessments– lack of reliable data for renewals/replacements and valuations.	Operational Financial	4	4	16	<ul style="list-style-type: none"> <li>▶ Internal and external feedback</li> <li>▶ Pipe condition assessments (sampling)</li> <li>▶ Pump station assessments</li> <li>▶ Reservoir inspections (W only)</li> <li>▶ Asset Management Systems Implementation</li> <li>▶ 2 Asset Engineers now employed</li> <li>▶ On-going data collection programme</li> </ul>	Fair	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continual assessments</li> <li>▶ Improve asset management system</li> <li>▶ Continue Staff training</li> <li>▶ Staff continuity</li> <li>▶ Develop condition assessment programme</li> <li>▶ Develop a process to ensure that knowledge is transferred, stored and accessible.</li> <li>▶ Define champions and successors. External backup.</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)			Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
WATO 8	Compliance with Legislation and legal requirements – inability or failure to comply with consents, statute and national standards. Increase in requirements.	Legislative Financial Reputation/ Image	4	3	12	<ul style="list-style-type: none"> <li>▶ Compliance with resource consents, RMA, subsidy requirements</li> <li>▶ Contract Conditions</li> <li>▶ Consents database</li> <li>▶ Staff training and development</li> <li>▶ Local government networking</li> <li>▶ Feedback from BOPRC</li> <li>▶ Use of external advice/resources</li> <li>▶ Some auditing of works contracts (e.g. traffic management, safety, OSH)</li> <li>▶ Monitoring of expiring consents and identifying new consents to be improved (define responsibilities)</li> </ul>	Good	4	2	8	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Key staff to keep updated on current legislation</li> <li>▶ Regular communications to staff</li> <li>▶ Development of Council procedures</li> <li>▶ Communicating effects of legislative change to Council/ LTP process</li> <li>▶ Develop programme for internal audit</li> </ul>	
WATO 9	Public Health and Safety – accidents causing injury and or damage to Whakatāne residents/visitors/or property resulting in claims and or negative publicity (e.g. falls and trips over protruding assets).	Health and Safety Reputation/Image Financial	4	3	12	<ul style="list-style-type: none"> <li>▶ Fencing</li> <li>▶ Signage</li> <li>▶ Design and location</li> <li>▶ Safety inspections</li> <li>▶ RFS feedback</li> <li>▶ LTP Consultation</li> <li>▶ Compliance with legislation and standards</li> </ul>	Good	4	2	8	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Project Delivery Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ On-going review of Council's liability and H &amp; S policy.</li> <li>▶ Levels of service determined from community consultation (LTP process)</li> <li>▶ Other community consultation</li> </ul>	

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)			Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
WAT10	Extreme Natural Hazards – (landslips/ earthquake/ tsunami/ volcanic/ major storm event) causing damage to assets and or hindering development.	Environmental Health and Safety Operational Financial	5	3	15	<ul style="list-style-type: none"> <li>▶ Emergency Response Plan – Network inspection and hazard identification</li> <li>▶ Member of Lifeline Group. (Emergency Response Group)</li> <li>▶ RFS feedback</li> <li>▶ Civil Defence Plan</li> <li>▶ Lifelines Group</li> <li>▶ Critical Assets Identified</li> <li>▶ Suppliers and Contractors identified and list is maintained</li> <li>▶ Maintenance contracts</li> <li>▶ Structure audits and renewals</li> <li>▶ Engineering Code of Practice</li> <li>▶ Building code/standards</li> </ul>	Fair	3	4	12	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Project Delivery Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Liaise with Regional agencies to identify hazards and ensure emergency response mechanisms are in place in the event of a hazard occurring</li> </ul>	
WAT11	Technology – inability to track technology, engineering developments/techniques, local and national trends and to utilise where relevant.	Operational	3	2	6	<ul style="list-style-type: none"> <li>▶ Local government networking</li> <li>▶ Staff development and training`</li> <li>▶ Use of external advice/resources</li> </ul>	Good	3	1	6	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Project Delivery Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ IT Policy/ IT Roadmap</li> <li>▶ Further staff development and training</li> </ul>	

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)	Effectiveness	Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor			Description	Consequence	Likelihood		
WAT1 2	Possible Political Interference, or inability of elected members to fulfil roles and responsibilities or disregard for community views.	Operational Reputation/ Image	3	5	15	<ul style="list-style-type: none"> <li>▶ Councillors roles well defined and implemented</li> <li>▶ Legislative requirements/ LTP process</li> <li>▶ Reports to Council and Community boards</li> <li>▶ Councillor induction/ handbook</li> <li>▶ Councillors conferences</li> </ul>	Good	2	4	8	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Chief Executive</li> </ul>	<ul style="list-style-type: none"> <li>▶ Manage process through Chief Executive</li> </ul>
WAT1 3	External Economic Influences (Cost Escalations) – terrorism, rising costs (e.g. fuel), pandemic, worldwide incidents.	Economic	3	2	6	<ul style="list-style-type: none"> <li>▶ Local government networking</li> <li>▶ Responding to national directives</li> <li>▶ Monitoring world events and reacting</li> </ul>	Fair	3	2	6	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Project Delivery Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Track national and global trends. Monitor key economic developments and liaise with central government.</li> </ul>
WAT1 4	Decrease in Funding – Both internal and external sources of funding. Risk of not applying for funding on time or not identifying potential areas where funding is required.	Operational Financial Reputation/ Image	4	2	8	<ul style="list-style-type: none"> <li>▶ Asset management process</li> <li>▶ Monitor other funding opportunities</li> <li>▶ Prioritising projects/ LTP process</li> <li>▶ Liaising with other Councils</li> <li>▶ Insurance Policy</li> <li>▶ Skill of staff/resources submitting external applications and reporting internally to Council</li> <li>▶ Applying for funding from Central Government schemes</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Project Delivery Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintain and manage clear lines of communication with key external agencies</li> <li>▶ Forecast likely scenarios regarding effects of budget changes</li> <li>▶ Using sustainable practices</li> <li>▶ Increase efficiency</li> <li>▶ Rationalise spending</li> <li>▶ Monitor changes in funding scheme</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)			Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
WAT15	Inadequate Planning for Growth – resulting in under-capacity infrastructure.	Operational Financial Reputation/ Image	4	3	12	<ul style="list-style-type: none"> <li>▶ District Plan</li> <li>▶ Growth Strategy</li> <li>▶ Asset Management Planning</li> <li>▶ Network modelling</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ General Manager Strategy and Planning</li> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Further development of Growth Strategy and Development Contributions Policy</li> <li>▶ Further develop network models and strategies for growth</li> </ul>	
WAT16	Increased Rainfall Intensity and Frequency – causing flooding, unpredictable weather events, global warming.	Operational Financial	4	2	8	<ul style="list-style-type: none"> <li>▶ Reviewing rainfall intensity history (figures used in design)</li> <li>▶ Upgrade of water treatment plant</li> <li>▶ Investigating for other ground water sources</li> </ul>	Fair	3	2	6	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Monitor trends</li> <li>▶ Increase Storage</li> </ul>	

**Table 24: Asset Management Risks – Water Collection, Treatment and Supply**

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)		Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
WAT17	Inability to fight fire in urban and residential areas – Due to lack of water or water pressure.	Operational Health and Safety	5	2	10	<ul style="list-style-type: none"> <li>▶ Hydrant testing</li> <li>▶ Network modelling</li> <li>▶ Pressure monitoring/management</li> <li>▶ Engineering code of practice</li> <li>▶ Water shutdown procedures</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Further Network Improvements (post network modelling)</li> <li>▶ Monitor customer complaints</li> <li>▶ Improve Pressure management/monitoring</li> <li>▶ Identify areas/seasons of high demand and instigate water restriction programme</li> </ul>
WAT18	Public Health Issues – from lack of hygiene due to inability of supply.	Health and Safety	4	2	8	<ul style="list-style-type: none"> <li>▶ Network modelling</li> <li>▶ On-going Capital Works programme</li> <li>▶ Engineering code of practice</li> <li>▶ Pressure monitoring</li> <li>▶ Catchment Risk Assessments undertaken</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Further Network Improvements (post network modelling)</li> <li>▶ Monitor customer complaints</li> <li>▶ Improve pressure monitoring/management</li> <li>▶ Use knowledge of areas/seasons of high demand to instigate water restriction programme</li> </ul>
WAT19	Insufficient water pressure – for everyday use.	Operational Reputation/Image	3	3	9	<ul style="list-style-type: none"> <li>▶ Network modelling</li> <li>▶ Engineering code of practice</li> <li>▶ Pressure monitoring</li> <li>▶ Bulk zoning and pressure management</li> </ul>	Fair	2	3	6	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ On-going Network Improvements (post network modelling)</li> <li>▶ Monitor customer complaints</li> <li>▶ Pressure management</li> <li>▶ Use knowledge of areas/seasons of high demand to instigate water restriction programme</li> </ul>



Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)		Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
WAT20	Unreliable supply – interrupting daily usage, fluctuating pressure or supply.	Operational Reputation/ Image	3	3	9	<ul style="list-style-type: none"> <li>▶ Pressure management/monitoring</li> <li>▶ Capital Works programme</li> <li>▶ Operational practices (e.g. opening closing valves after maintenance)</li> <li>▶ Network modelling</li> <li>▶ Water Safety Plans developed</li> </ul>	Good	2	2	4	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Processes to monitor and record asset condition</li> <li>▶ Improve Pressure management</li> <li>▶ Network improvements (post modelling)</li> </ul>
WAT21	Failure to supply – due to high public demand, unplanned for growth, or inadequate planning for maintenance and construction.	Operational Reputation/ Image Health and Safety	4	2	8	<ul style="list-style-type: none"> <li>▶ District Plan</li> <li>▶ Engineering Code of Practice</li> <li>▶ Development contributions</li> <li>▶ Network modelling</li> <li>▶ Capital works programme</li> </ul>	Good	4	1	4	<ul style="list-style-type: none"> <li>▶ Project Delivery Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Further Network improvements (post modelling)</li> <li>▶ Review of practices and procedures</li> <li>▶ development of growth strategy and development contributions policy</li> <li>▶ Review capital works programme</li> </ul>
WAT22	Failure to supply – due to drought.	Operational Health and Safety Livestock Health Horticultural	5	3	15	<ul style="list-style-type: none"> <li>▶ Emergency Response Plan (being developed)</li> <li>▶ Identify areas/seasons of high demand and instigate water restriction programme - as necessary</li> <li>▶ Water Safety Plans</li> <li>▶ Alternative water source</li> </ul>	Fair	5	1	5	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Implement supply restrictions.</li> <li>▶ Community Education (develop website capabilities)</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)	Effectiveness	Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor			Consequence	Likelihood	Factor		
WAT23	Failure to supply – due to breakage in the network from contractors, old materials, vandalism, landslip.	Operational Health and Safety Reputation/Image	4	4	16	<ul style="list-style-type: none"> <li>▶ Capital Works programme</li> <li>▶ Water Safety Plans developed</li> <li>▶ GIS information made available to Contractors</li> <li>▶ Process to monitor and record asset condition in place.</li> </ul>	Fair	2	3	6	<ul style="list-style-type: none"> <li>▶ Develop audit to check work adequately completed.</li> <li>▶ Improve Processes to monitor and record asset condition</li> </ul>	
WAT24	Failure to supply – adequately treated water due to inadequacies of treatment plant.	Operational Health and Safety Reputation/Image	4	2	8	<ul style="list-style-type: none"> <li>▶ Processes and procedures</li> <li>▶ Continuous remote monitoring of WTP</li> <li>▶ Water quality testing (Operations/WINZ DoH)</li> <li>▶ Emergency Response Plan developed</li> <li>▶ Capital works programme</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Comply with NZDWS as per amendment to Health Act</li> <li>▶ Regular monitoring of plant.</li> </ul>
WAT25	Failure to supply – treated water due to pesticides, faecal matter, fuel/chemical spill, sediment in catchment areas/source.	Operational Health and Safety	4	2	8	<ul style="list-style-type: none"> <li>▶ Procedures and processes for monitoring at treatment plant</li> <li>▶ Continuous remote monitoring of WTP</li> <li>▶ Completed Catchment Risk Assessments</li> <li>▶ Capital Works Programme</li> </ul>	Fair	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Be prepared to use alternative supplies or to interrupt supplies</li> <li>▶ Action plan as per Water Safety Plans including audit survey, catchment monitoring, pesticide awareness.</li> <li>▶ Improve communications with emergency services (linking crashes/spills to treatment plant)</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type		Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)		Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
				Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
WAT26	Contamination causing sickness or serious harm – introduce externally via breakage, entry hatches, vandalism.	Health and Safety	Operational Reputation/Image	4	2	8	<ul style="list-style-type: none"> <li>▶ Contractor training cross-contamination</li> <li>▶ Maintain security procedures. (Water Safety Plans)</li> <li>▶ Contractor potholing for services</li> <li>▶ Audit network</li> <li>▶ Penalty Charges</li> </ul>	Fair	4	1	4	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Have response plan prepared, critical control points</li> </ul>
WAT27	Contamination causing sickness or serious harm (Treatment) – introduced at the treatment plant or from inadequate treatment or dosing.	Health and Safety	Operational	4	4	16	<ul style="list-style-type: none"> <li>▶ Processes and procedures</li> <li>▶ Water quality monitoring</li> <li>▶ Continuous remote monitoring of WTP</li> <li>▶ Staff trained and qualified</li> <li>▶ Water Safety Plans developed</li> </ul>	Good	4	1	4	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Plant adjustments (Water Safety Plans)</li> <li>▶ Action plan as per Water Safety Plan including audit survey,</li> <li>▶ Continue catchment monitoring</li> </ul>
WAT28	Contamination causing sickness or serious harm (Network) – introduced internally from reservoirs, old pipes, new materials, stagnant/low flows.	Health and Safety	Operational Reputation/Image	4	4	16	<ul style="list-style-type: none"> <li>▶ Processes and practices</li> <li>▶ Engineering Code of Practice</li> <li>▶ Capital works programme</li> <li>▶ Regular water quality monitoring and testing in accordance with NZ Drinking Water Standards (NZDWS)</li> <li>▶ Programme of controlled cleaning.</li> <li>▶ Emergency Response Plan in place</li> <li>▶ Water Safety Plans developed</li> </ul>	Good	4	1	4	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Manager Project Delivery</li> </ul>	<ul style="list-style-type: none"> <li>▶ Update network model (on-going)</li> <li>▶ Audit network</li> <li>▶ Improve programme of controlled cleaning – update procedures</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type		Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)		Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
				Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
WAT29	Contamination causing sickness or serious harm (backflow) – introduced via backflow due to lack of backflow device, failure of device, via hydrant or illegal connections.	Health and Safety	Operational Reputation/Image	4	4	16	<ul style="list-style-type: none"> <li>▶ Regular monitoring in accordance with NZ Drinking Water Standards (NZDWS)</li> <li>▶ Applications for connection dealt with case by case</li> <li>▶ Cross Contamination Policy – Backflow prevention devices (BPD) to be developed</li> <li>▶ Education of landowners and occupants of contamination risks and the importance of BFP devices and good practice</li> <li>▶ Engineering code of practice (device standards for rural/farms, trade waste)</li> <li>▶ Policy for water take from hydrants</li> <li>▶ Trade waste management</li> </ul>	Fair	4	2	8	<ul style="list-style-type: none"> <li>▶ Three Waters Operational Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Manager Project Delivery</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continue to educate landowners and occupants of risks</li> <li>▶ Improve communication regarding change of use (building/regulatory to engineering)</li> <li>▶ Enforcing and improving policy for water take from hydrants</li> <li>▶ Auditing for illegal water taking and connections</li> </ul>
WAT30	Unaccounted for water – Cost.	Operational	Financial Reputation/Image	3	4	12	<ul style="list-style-type: none"> <li>▶ Majority metered</li> <li>▶ Unaccounted for water (UFW) calculation</li> <li>▶ Internal reporting</li> <li>▶ Leak detection programmes</li> <li>▶ Calibration of meters</li> <li>▶ Hydrant permits</li> <li>▶ Reports of illegal takes</li> <li>▶ Monitor consumption in areas suspected of illegal connections</li> </ul>	Fair	3	3	9	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Do all current measures better/more systematically?</li> <li>▶ Meter unmetered schemes</li> <li>▶ Concentrate on the worst areas (some areas are better than others)</li> </ul>

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)	Effectiveness	Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor			Consequence	Likelihood	Factor		
WAT31	Damages to property or environment due to breakage/leaks	Operational Reputation/Image Financial Environmental	3	1	3	<ul style="list-style-type: none"> <li>▶ Maintenance procedures</li> <li>▶ Capital works programme</li> <li>▶ Leak Detection Programme</li> <li>▶ Pressure Management Programme</li> </ul>	Good	3	1	3	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	▶ Improvement to existing programmes
WAT32	Environmental contamination – from chemicals used in the treatment process.	Health and Safety Reputation/Image Environmental Legislative	4	4	16	<ul style="list-style-type: none"> <li>▶ Operations manuals/ emergency procedures</li> <li>▶ Continuous remote monitoring at WTP</li> <li>▶ Resource Consent from BOPRC</li> <li>▶ Storage/ security/ physical barriers</li> <li>▶ Staff training</li> <li>▶ Safety audits</li> </ul>	Good	3	1	3	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continue staff training</li> <li>▶ Review &amp; Update Operations Manuals</li> </ul>
WAT33	Handover of assets - low quality assets being handed over from developers and/or contractors.	Operational Financial Reputation/Image	4	3	12	<ul style="list-style-type: none"> <li>▶ Engineering Code of Practice</li> <li>▶ Development/Subdivision control</li> <li>▶ Consent Processes (LUC, SUB and BC)_</li> <li>▶ Vesting of Asset Process</li> <li>▶ Project Completion Report</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Assets Engineers</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Approved contractors</li> <li>▶ Improve monitoring and inspections</li> <li>▶ Improved enforcement of Engineering Code of Practice</li> <li>▶ Improve Consent and Vesting Processes.</li> </ul>
WAT31	Discharge of water resulting in damage to property or environment – via breakage/leak.	Operational Reputation/Image Financial Environmental	3	1	3	<ul style="list-style-type: none"> <li>▶ Maintenance procedures</li> <li>▶ Renewal programme</li> </ul>	Good	3	1	3	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Manager Project Delivery</li> <li>▶ Three Waters Operational Manager</li> </ul>	▶ Improvement existing programmes

Risk Reference	Risk Descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk Type	Gross Risk (No effective measures in place)			Current Practice/Strategy (Avoidance and mitigation measures)		Net Risk (Considering measures in place)			Person(s) Responsible	Management Options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
WAT32	Environmental contamination – from chemicals used in the treatment process.	Health and Safety Reputation/Image Environmental Legislative	4	4	16	<ul style="list-style-type: none"> <li>▶ Operations manuals/ emergency procedures</li> <li>▶ Continuous remote monitoring at WWTP</li> <li>▶ Storage/ security/ physical barriers</li> <li>▶ Staff training</li> <li>▶ Safety audits</li> </ul>	Good	3	1	3	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ On-going approved training</li> <li>▶ Review &amp; Update Operations Manuals</li> </ul>
WAT33	Handover of assets - low quality assets being handed over from developers and/or contractors.	Operational Financial Reputation/Image	4	5	20	<ul style="list-style-type: none"> <li>▶ Engineering Code of Practice</li> <li>▶ Development/Subdivision control</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Approved contractors</li> <li>▶ Improve monitoring and inspections</li> <li>▶ Improved enforcement of Engineering Code of Practice</li> </ul>

### 6.2.3 Risk Action Plan

Table 25 below is compiled from the Risk Register and highlights the most significant Net Risks faced by the Water supply activity. The main risks are listed in order of severity (Net risk) as assigned in consultation with the Council's key officers.

**Table 25: Risk Action Plan**

Risk Reference	Risk Descriptor	Risk Type	Net Risk	Action	Responsibility	Timeframe
WAT02	Knowledge management – inability to retain knowledge or have sufficient systems in place to manage data/information, especially regarding asset performance and condition. Loss of institutional knowledge. IT failure.	Financial Operational	12	<ul style="list-style-type: none"> <li>▶ Develop a process to ensure that knowledge is transferred, stored and accessible. Define champions and successors. External backup.</li> <li>▶ Suitable training for staff</li> <li>▶ Protocols for update and on-going auditing</li> <li>▶ Customisation of Asset Management systems to meet needs</li> <li>▶ Development of Staff Retention Policy</li> </ul>	<ul style="list-style-type: none"> <li>▶ HR Manager</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	On-going
WAT10	Extreme Natural Hazards – (landslips/ earthquake/ tsunami/ volcanic/ major storm event) causing damage to assets and or hindering development.	Environmental Health and Safety Operational Financial	12	<ul style="list-style-type: none"> <li>▶ Liaise with Regional agencies to identify hazards and ensure emergency response mechanisms are in place in the event of a hazard occurring</li> </ul>	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Operations Team Leaders</li> </ul>	On-going
WAT16	Increased Rainfall Intensity and Frequency – causing flooding, unpredictable weather events, global warming.	Operational Financial	9	<ul style="list-style-type: none"> <li>▶ Monitor trends</li> <li>▶ Increase Storage</li> </ul>	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	On-going in 2018-2028 LTP
WAT05	Capital Works Contract Management – unsatisfactory, resulting in unnecessary or excessive costs and/or insufficient output or quality. Poor Contractor performance.	Operational Financial Reputation/ Image Health and Safety	9	<ul style="list-style-type: none"> <li>▶ Contract procedures manual (needs to be finalised - currently in draft format) (including closure/ review)</li> <li>▶ Further improve Auditing and Reporting (including performance)</li> <li>▶ Contract review and improvement</li> </ul>	<ul style="list-style-type: none"> <li>▶ General Manager Infrastructure</li> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> <li>▶ Manager Project Delivery</li> </ul>	On-going

Risk Reference	Risk Descriptor	Risk Type	Net Risk	Action	Responsibility	Timeframe
WAT13	External Economic Influences (Cost Escalations) – terrorism, rising costs (e.g. fuel), pandemic, worldwide incidents.	Economic	9	<ul style="list-style-type: none"> <li>Track national and global trends. Monitor key economic developments and liaise with central government.</li> </ul>	<ul style="list-style-type: none"> <li>General Manager Infrastructure</li> <li>Three Waters Assets and Planning Manager</li> <li>Three Waters Operational Manager</li> </ul>	On-going
WAT30	Unaccounted for water – Cost.	Operational Financial Reputation/Image	9	<ul style="list-style-type: none"> <li>Do all current measures better/more systematically?</li> <li>Meter unmetered schemes</li> <li>Concentrate on the worst areas (some areas are better than others)</li> </ul>	<ul style="list-style-type: none"> <li>Three Waters Assets and Planning Manager</li> <li>Three Waters Operational Manager</li> </ul>	On-going in LTP
WAT01	Lack of resources – the ability to attract key staff and or retain skilled staff.	Operational Financial	8	<ul style="list-style-type: none"> <li>Look at review of recruitment policy (current lack of policies) Family/Lifestyle friendly policies</li> <li>Look at improving Career development Draft policy/programme needs completing?</li> <li>Review salary levels and incentives</li> <li>Implement the Performance Development system ASAP</li> </ul>	<ul style="list-style-type: none"> <li>HR Manager</li> <li>General Manager Infrastructure</li> <li>Three Waters Assets and Planning Manager</li> <li>Three Waters Operational Manager</li> <li>Manager Project Delivery</li> </ul>	On-going
WAT08	Compliance with Legislation and legal requirements – inability or failure to comply with consents, statute and national standards. Increase in requirements.	Legislative Financial Reputation/ Image	8	<ul style="list-style-type: none"> <li>Key staff to keep updated on current legislation</li> <li>Regular communications to staff</li> <li>Development of Council procedures</li> <li>Communicating effects of legislative change to Council/ LTP process</li> <li>Develop programme for internal audit</li> </ul>	<ul style="list-style-type: none"> <li>General Manager Infrastructure</li> <li>Three Waters Assets and Planning Manager</li> <li>Three Waters Operational Manager</li> </ul>	On-going
WAT09	Public Health and Safety – accidents causing injury and or damage to Whakatāne residents/visitors/or property resulting in claims and or negative publicity (e.g. falls and trips over protruding assets).	Health and Safety Reputation/ Image Financial	8	<ul style="list-style-type: none"> <li>On-going review of Council’s liability and H &amp; S policy.</li> <li>Levels of service determined from community consultation (LTP process)</li> <li>Other community consultation</li> </ul>	<ul style="list-style-type: none"> <li>HR Manager</li> <li>General Manager Infrastructure</li> <li>Three Waters Assets and Planning Manager</li> <li>Three Waters Operational Manager</li> <li>Manager Project Delivery</li> </ul>	On-going
WAT12	Possible Political Interference, or inability of elected members to fulfil roles and	Operational Reputation/ Image	8	<ul style="list-style-type: none"> <li>Manage process through Chief Executive</li> </ul>	<ul style="list-style-type: none"> <li>General Manager Infrastructure</li> <li>Chief Executive</li> </ul>	On-going



Risk Reference	Risk Descriptor	Risk Type	Net Risk	Action	Responsibility	Timeframe
	responsibilities or disregard for community views.					
WAT17	Inability to fight fire – Due to lack of water or water pressure.	Operational Health and Safety	8	<ul style="list-style-type: none"> <li>▶ Further Network Improvements (post network modelling)</li> <li>▶ Monitor customer complaints</li> <li>▶ Improve Pressure management/monitoring</li> <li>▶ Identify areas/seasons of high demand and instigate water restriction programme if required</li> </ul>	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	On-going
WAT29	Contamination causing sickness or serious harm (backflow) – introduced via backflow due to lack of backflow device, failure of device, via hydrant or illegal connections.	Health and Safety Operational Reputation/ Image	8	<ul style="list-style-type: none"> <li>▶ Continue to educate landowners and occupants of risks</li> <li>▶ Enforcing and improving policy for water take from hydrants</li> <li>▶ Auditing for illegal water taking and connections</li> </ul>	<ul style="list-style-type: none"> <li>▶ Three Waters Assets and Planning Manager</li> <li>▶ Three Waters Operational Manager</li> </ul>	Ongoing

### 6.3 Lifecycle Management – Operations and Maintenance

Operational and maintenance plans document how the assets will be operated on a day to day basis, including instances where portions of the asset fail, by carrying out activities that are aimed at keeping the asset in service and meeting asset management objectives.

#### 6.3.1 *Operational Objectives and Performance Measures*

In section 3 [Levels of Service](#), the framework showed a hierarchy of objectives, organisation objectives, asset management objectives, levels of service through to operational and technical objectives.

#### 6.3.2 *Routine Maintenance Plan*

Maintenance includes unplanned (reactive), planned (proactive) and recurring (cyclic) maintenance work activities.

##### **Reactive (unplanned) maintenance**

Reactive maintenance is the response to service requests and public complaints. The urgency of the response required depends on the risk associated with the request or complaint and is defined through the LoS. Response time for urgent and routine requests is specified in the LoS.

Example of reactive maintenance activities include:

- Responding to requests for service to do with water-mains breaks or service disruptions within the water network
- Fixing the leaks on the water mains/connections/joints on the Council's asset
- Replacing a minor faulting asset such as water meter, valves, etc.
- Post response investigations to establish the extent of the problem following service restoration

An urgent response is required when public health and safety is of concern.

##### **Preventive (planned) maintenance**

Preventive maintenance works are carried out to a predetermined schedule or planned in association with other works and is repair work that is identified and managed through a maintenance management system. The frequency of the works is determined according to the cost-effectiveness of the maintenance. Preventive maintenance activities include:

- High risk asset inspection and fixing at specified frequencies such as water supply pump stations, water treatment plants and pressure reducing valve maintenance
- Routine and annual detail inspections of pump stations
- Hydrant Flushing
- Reservoir inspection and maintenance
- Water treatment plant detail inspections

- Making adjustments, cleaning, lubricating and replacing minor components at regular intervals for equipment such as pumps
- Responding to water connection/disconnection requests from customers.

### Cyclic Maintenance

Cyclic maintenance is the replacement of lower value components/sub-components of assets undertaken on a regular cycle. This work generally falls below the capital replacement threshold.

Currently, the Council does not have a fully developed computer maintenance management system (CMMS), although the implementation of a comprehensive CMMS is planned within the next 18 months.

The Council's Operational Team conducts regular programmed inspections and maintenance for non-pipeline water supply assets. Detailed checklists are completed during inspections and include areas such as security, workplace safety, building and grounds maintenance and the condition of assets.

The maintenance of mechanical, electrical and telemetry/communication assets is carried out by the Council's Operational Team and the Council's contractors on a routine basis, with the condition of assets recorded during this process.

## 6.4 Lifecycle Management – Renewal

Assets are generally renewed when they can no longer able perform their duty due to structural defects and/or performance failures. Renewals are works to replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability and include replacement and rehabilitation.

Asset renewals are not targeted at increasing the level of service or to increase the capacity of an asset to server a growing demand although integrating renewal planning with improvement works (new capital works) planning provides cost optimisation opportunities.

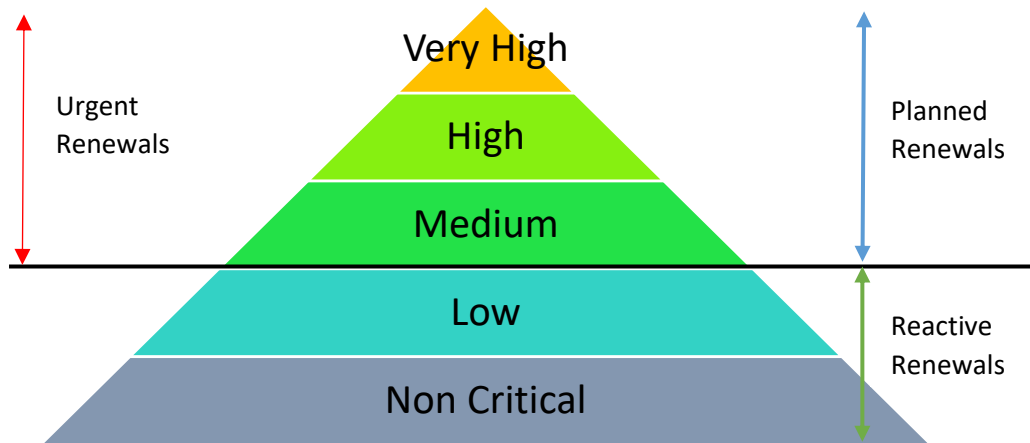
An asset renewal programme is prepared and confirmed on the following basis:

- The base life of the assets – from the Asset Management System
- The maintenance history and expenditure – from the Asset Management System and Council's Request for Services (RFS) system
- The condition assessment of assets – routine inspections, pipe sampling, visual inspection, etc.
- Applying a risks based approach – criticality of the asset, public safety.
- External factors such as
  - Natural disaster events
  - Working In line with the transportation department renewal programme
  - Three party works within the same asset corridor
  - Regulatory requirements (i.e. safety)

- The operating environment
- Construction defects
- Aggressive soils /environment etc.

Figure 16 below shows how renewal priorities are based on criticality.

**Figure 16: Types of renewals based on criticality**



### 6.5 Lifecycle Management – Creation and Acquisition

Some of the new water supply assets are created by third parties, mainly developers, and handed over/ vested to the Council to manage. The Council has indirect input into this process through the preparation of water supply design standards, the Engineering Code of Practice, and construction, operations and maintenance guides for water supply assets.

The Council will also design and construct new works to accommodate levels of service, changes in demand requirements, and/or due to growth requirements. Asset creation involves the design and construction of new assets to increase the capacity or performance of the system. Generally, design and construction is outsourced via the Council’s tender and procurement processes. At the completion of a project, asset data as well as ‘as-built’ drawings are handed to the Three Waters Asset Team to update the asset management system.

### 6.6 Lifecycle Management – Disposal

Disposal includes any activity associated with disposal of a decommissioned asset including sales, demolition or relocation.

The Council disposes of an asset when it becomes uneconomical to maintain and/or replace.

Generally, when renewing reticulated water pipelines, it is cost beneficial to leave the existing ‘end of life’ pipeline in the ground and construct a new water pipeline. The existing pipe is normally plugged at either end and left in the ground or in some circumstances filled with flowable slurry fill. In extreme situations, the original pipe will be exhumed and the ground completely compacted and filled, with the surface area reinstated.

Often there will be significant costs associated with decommissioning and disposal of water assets in particular above ground structures such as water pumping stations and reservoirs.

## 6.7 Lifecycle Management – Future Improvement

This AMP is prepared as a ‘core’ AMP, meaning that assumptions are used, asset data have been graded for confidence (a grade ‘C to B’) and the past asset management system has gaps associated with asset data. Future revisions of the AMP will move towards ‘intermediate to advanced’ asset management practices to optimised Lifecycle Management.

Over the course of the next two years, the new asset management system will be sufficiently populated to allow for renewals modelling to be undertaken as part of the renewals planning process. The projected 10-year renewal expenditure will be improved as data confidence, accuracy and asset condition assessments update asset data. Current budgets may be adequate to maintain the current levels of service. As better asset data and management of the data becomes available, confidence will build and budgets will require modification to meet future renewal programme requirements.

There are no formal Operation and Maintenance Plans for day-to-day lifecycle management but a number of procedures exist within the Council. The Council is working towards utilising the new AMS incorporating a maintenance management system that is expected to be implemented over the next 2 years.

To reduce the large future cost, the Council is discussing strategies with stakeholders and effected parties which include:

- Improve our education programme to bridge the gap in communities’ understanding of the Council’s water supply system and how precious water is.
- Any renewals and new developments shall be designed to accommodate future demand within a reasonable time period.
- Pre-approval of quality material/products with appropriate longevity of life shall be used within the Council’s reticulation network.
- Construction of the network shall be monitored and guided to make sure that a quality asset is built.

## 7 Financial Forecasts

To undertake a sustainable, long-term approach to asset management, it is essential to prepare long-term financial forecasts. This section sets out the financial forecasts put forward in the LTP (2018-2028) for water supply activity.

### 7.1 Financial Strategy

This plan substantiates the budget forecasts put forward in the LTP (2018-2028) for water supply asset management. The Council is going to:

- Implement an improvement approach to asset management planning in the short term. Improvement plans are included in each asset management plan and any improvement project will be monitored quarterly as part of the Council's performance reporting system.
- Prepare, maintain and periodically review an AMP outlining sustainable long-term asset management strategies. AMPs are considered living documents that are an integral part of Three Waters daily activity, with a full review occurring on a three-yearly timeframe well in advance of the LTP. The AMP may be re-issued outside programmed timeline if significant issues have arisen.
- Report variations in the adopted annual plan budgets against the original asset management plan forecasts and explain the level of service implications of budget variations.

### 7.2 Key Assumptions

This section details the key assumptions made in presenting the information contained in the asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimated. It is presented to enable readers to gain an understanding of the level of confidence in the data behind the financial forecasts.

The following assumptions have been made in preparing the 10-year expenditure forecasts:

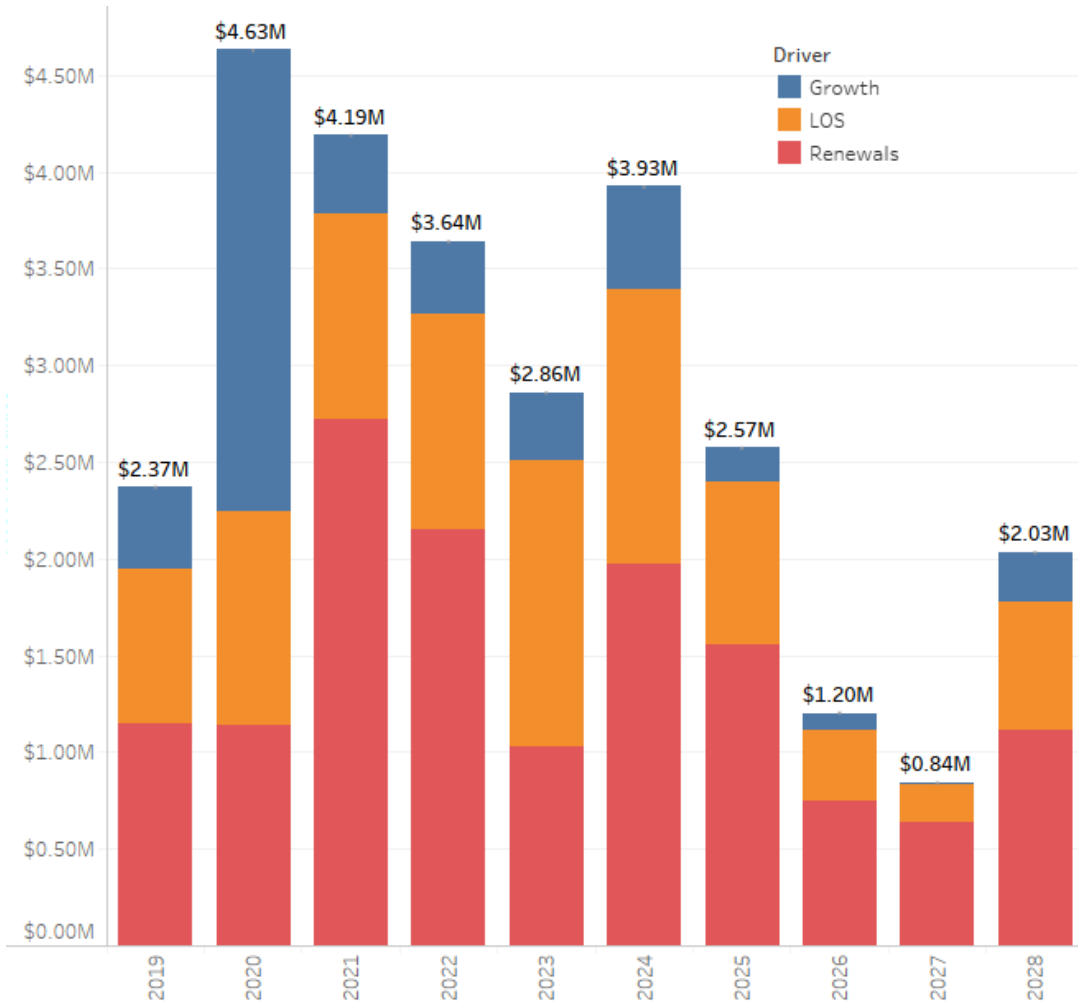
- Asset information is as complete as possible at 30 June 2017. This is based on the GIS and Hansen asset data.
- Only water supply assets managed by the Council's Three Waters team have been valued, private schemes are not included.
- The determination of asset replacement value, depreciated value and renewal projections are based on valuation data as at 30 June 2017.
- All projected expenditure is stated in 2017-18 dollar values with no allowance made for inflation.
- Operation costs are largely based on historical expenditure.
- Maintenance and operations allocations are largely based on maintaining current service levels.

- The data confidence for the water supply asset are described in Table 5 in Section 2.1.5.

### 7.3 Capital Expenditure

The figures below show the capital expenditure forecast for the next 10 years. The expenditure forecast in Figure 17 and Table 26 below are detailed in **Appendix 4**.

**Figure 17: Capital Expenditure Forecast in 10 years by *difference drivers***



**Table 26: Major Project Forecast in 10 years**

Group Project	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Grand Total
Reservoirs Condition and Improvements		\$0.71M	\$2.68M	\$2.48M	\$0.55M	\$1.70M	\$1.16M	\$0.59M			\$9.88M
Water Reticulation Renewal	\$0.49M	\$0.36M	\$0.77M	\$0.54M	\$0.64M	\$0.91M	\$0.34M	\$0.36M	\$0.53M	\$0.58M	\$5.53M
W11 Whakatane Riverbank Filtra	\$0.30M	\$2.06M									\$2.36M
Water Safety Plan Upgrade	\$0.52M	\$0.37M	\$0.34M	\$0.36M	\$0.09M	\$0.03M	\$0.03M				\$1.74M
Replacement of Water Take Recourse C..	\$0.05M	\$0.02M		\$0.03M	\$0.11M	\$0.11M	\$0.16M	\$0.17M	\$0.17M	\$0.64M	\$1.47M
Hydrogeological Study					\$1.08M						\$1.08M
Plains W - Whk Sludge Treatmen					\$0.06M	\$0.85M					\$0.90M
Ohope W- Upgrade Pipes Harbour							\$0.75M				\$0.75M
Ohope timber reservoir replacement										\$0.62M	\$0.62M
Whakatane Water Treatment Plant Ren..	\$0.03M	\$0.02M	\$0.24M	\$0.02M	\$0.03M	\$0.02M	\$0.03M	\$0.03M	\$0.10M	\$0.06M	\$0.58M
Whk Water-Coastlands Link Main					\$0.28M	\$0.28M					\$0.56M
W 2.3 water meter installation program..		\$0.56M									\$0.56M
OHOPE W-Supply Main from Ngati	\$0.50M										\$0.50M
Otumahi additional watermains	\$0.10M	\$0.26M									\$0.36M
Water Losses and Leak Detection	\$0.09M	\$0.08M	\$0.03M	\$0.09M	\$0.01M						\$0.29M
Smapling Program	\$0.03M			\$0.08M			\$0.04M			\$0.09M	\$0.24M
Condition Assessment	\$0.00M	\$0.00M	\$0.03M	\$0.02M	\$0.02M	\$0.02M	\$0.00M	\$0.06M	\$0.02M	\$0.02M	\$0.20M
Modelling		\$0.11M	\$0.05M	\$0.02M							\$0.18M
Others	\$0.26M	\$0.08M	\$0.05M	\$0.00M	\$0.00M	\$0.00M	\$0.05M	\$0.00M	\$0.02M	\$0.01M	\$0.48M

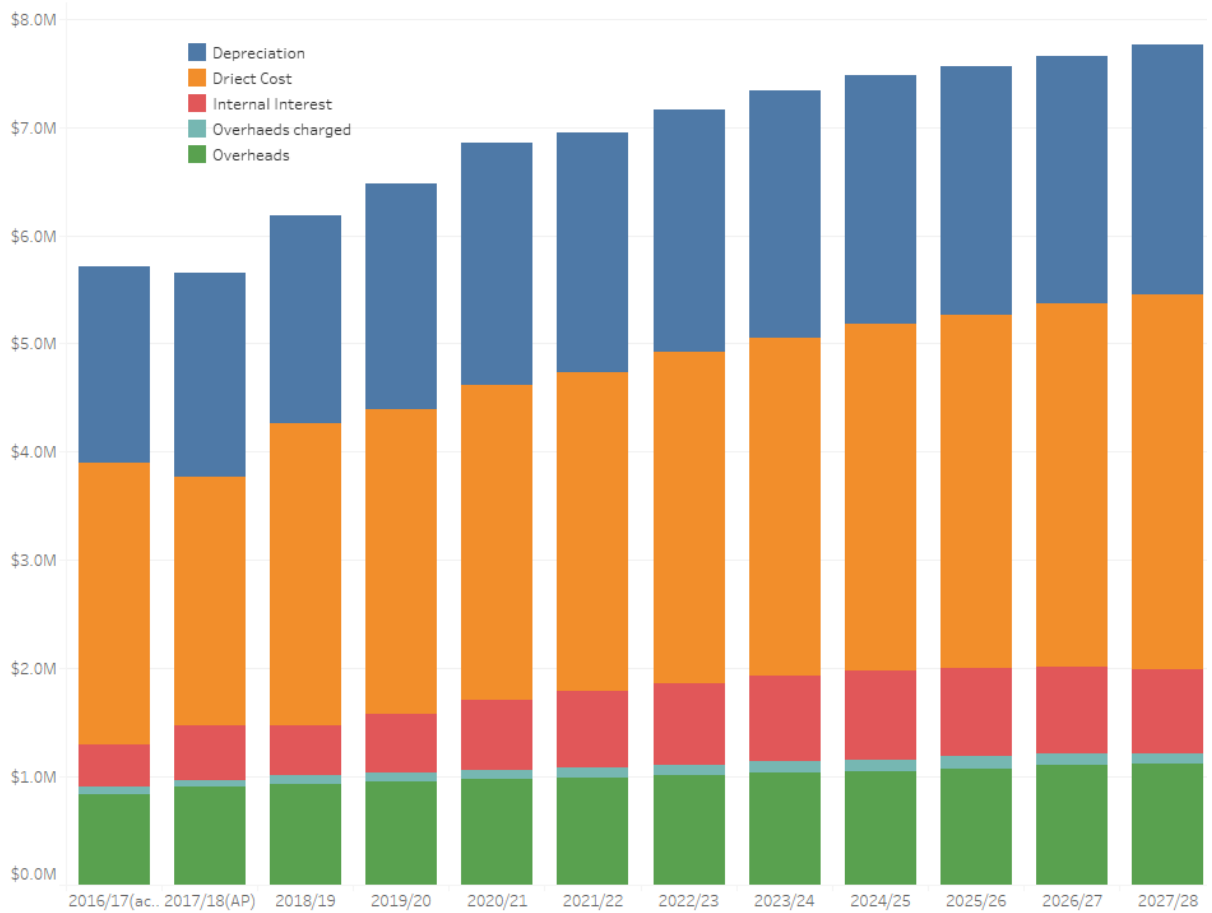


### 7.4 Operation and Maintenance Expenditure

Figure 18 below shows the operation and maintenance expenditure for last financial year (actual), current financial year (current annual plan) and the forecast for the next 10 years.

The details in Table 26 are explained in Table 27.

**Figure 18: Operation and Maintenance Costs**



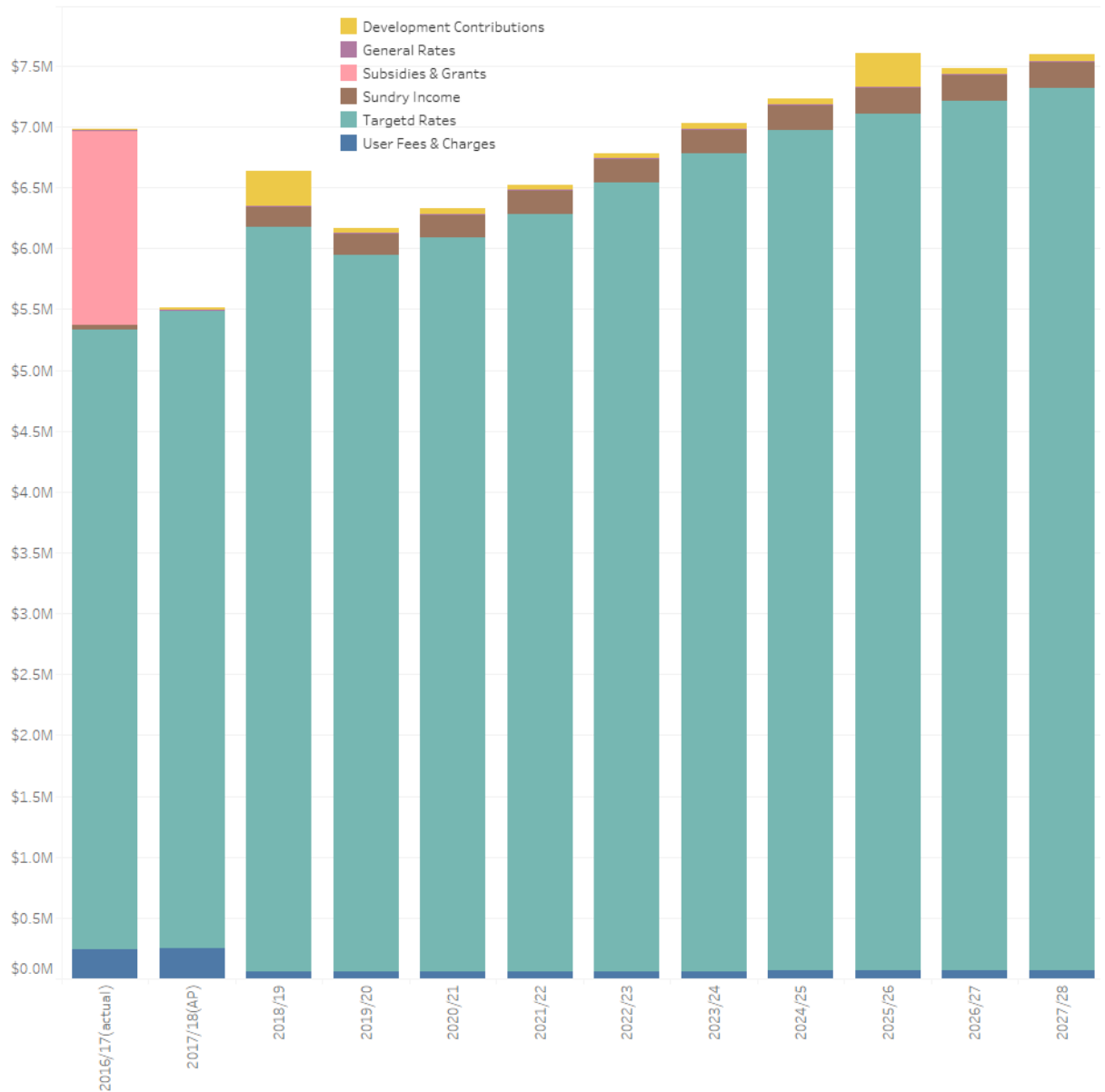
**Table 27: Operation Cost Details**

PostCodes	2016/17(act..	2017/18(AP)	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
3010 - Advertising	\$0.71K	\$0.00K	\$0.50K	\$0.51K	\$0.53K	\$0.54K	\$0.55K	\$0.57K	\$0.58K	\$0.59K	\$0.61K	\$0.62K
3070 - Chemicals	\$190.71K	\$144.62K	\$214.75K	\$220.66K	\$225.81K	\$231.18K	\$236.76K	\$242.55K	\$248.56K	\$254.79K	\$261.23K	\$268.10K
3080 - Cleaning	\$1.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3120 - Consultants	\$32.44K	\$7.00K	\$29.13K	\$10.28K	\$10.52K	\$10.77K	\$26.47K	\$11.30K	\$11.58K	\$11.87K	\$12.17K	\$29.98K
3140 - Contracts	\$103.36K	\$58.08K	\$75.60K	\$77.72K	\$79.53K	\$81.42K	\$83.39K	\$85.43K	\$87.54K	\$79.05K	\$81.05K	\$83.18K
3150 - Contributions	\$0.00K	\$0.00K	\$0.00K	\$5.14K	\$5.26K	\$5.39K	\$5.52K	\$5.65K	\$5.79K	\$5.94K	\$6.09K	\$6.25K
3175 - Datran	\$9.76K	\$18.59K	\$17.45K	\$17.94K	\$18.36K	\$17.18K	\$17.59K	\$18.02K	\$18.47K	\$18.93K	\$19.41K	\$19.92K
3178 - DCST Reallocated-3 Waters	\$776.39K	\$661.29K	\$674.47K	\$693.20K	\$712.78K	\$732.95K	\$753.26K	\$774.16K	\$795.21K	\$816.85K	\$838.63K	\$861.16K
3182 - DCST Reallocated-Water Ad.	\$154.48K	\$151.19K	\$48.74K	\$54.86K	\$55.91K	\$57.02K	\$58.15K	\$59.33K	\$60.53K	\$61.79K	\$63.06K	\$64.41K
3183 - DCST Recovered from Operat..	-\$154.48K	-\$151.19K	\$131.26K	\$130.18K	\$133.45K	\$136.84K	\$140.39K	\$144.07K	\$147.91K	\$151.87K	\$156.00K	\$160.41K
3189 - Reallocated (Plains Water)	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3191 - DCST Reallocated - Mowing	\$3.27K	\$5.10K	\$4.96K	\$5.02K	\$5.10K	\$5.21K	\$5.33K	\$5.43K	\$5.52K	\$5.64K	\$5.72K	\$5.19K
3192 - DCST Reallocated-3W Capt W..	\$0.00K	\$0.00K	\$57.06K	\$50.77K	\$51.64K	\$52.56K	\$53.48K	\$54.45K	\$55.43K	\$56.45K	\$57.48K	\$58.56K
3193 - DCST Reallocated-3W Asset ..	\$0.00K	\$0.00K	\$164.59K	\$164.84K	\$178.76K	\$169.96K	\$174.01K	\$189.09K	\$179.62K	\$184.09K	\$200.29K	\$190.22K
3210 - Electricity	\$486.66K	\$530.00K	\$648.60K	\$666.76K	\$682.33K	\$698.54K	\$715.41K	\$732.92K	\$751.08K	\$769.89K	\$789.35K	\$810.10K
3230 - Equipment & Materials	\$167.87K	\$80.40K	\$161.36K	\$159.14K	\$170.54K	\$166.73K	\$178.81K	\$175.61K	\$187.72K	\$183.17K	\$196.68K	\$192.73K
3235 - Loose Tools	\$0.37K	\$0.00K	\$0.50K	\$0.51K	\$0.53K	\$0.54K	\$0.55K	\$0.57K	\$0.58K	\$0.59K	\$0.61K	\$0.62K
3290 - Freight	\$0.00K	\$1.00K	\$1.75K	\$1.80K	\$1.84K	\$1.88K	\$1.93K	\$1.98K	\$2.03K	\$2.08K	\$2.13K	\$2.19K
3320 - General Expenses	\$20.08K	\$3.70K	\$19.13K	\$21.02K	\$21.51K	\$22.02K	\$24.76K	\$23.11K	\$23.68K	\$24.27K	\$24.89K	\$28.04K
3350 - Insurances	\$29.63K	\$32.73K	\$35.08K	\$38.59K	\$42.09K	\$45.60K	\$49.11K	\$52.62K	\$56.12K	\$59.63K	\$63.14K	\$66.65K
3390 - Leasing	\$0.32K	\$0.75K	\$5.09K	\$5.23K	\$5.35K	\$5.48K	\$5.61K	\$5.75K	\$5.89K	\$6.04K	\$6.19K	\$6.35K
3400 - Legal Costs	\$37.35K	\$1.00K	\$2.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3410 - Licensing Fees	\$0.00K	\$1.00K	\$12.00K	\$12.24K	\$12.62K	\$12.92K	\$13.24K	\$13.56K	\$13.90K	\$14.24K	\$14.60K	\$14.99K
3440 - Maintenance and Repairs	\$143.29K	\$170.30K	\$172.95K	\$165.20K	\$169.85K	\$170.92K	\$186.08K	\$183.00K	\$195.93K	\$194.31K	\$197.40K	\$215.70K
3465 - Mileage Charges	\$0.20K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3590 - Printing and Stationery	\$0.02K	\$0.45K	\$0.45K	\$0.46K	\$0.47K	\$0.48K	\$0.50K	\$0.51K	\$0.52K	\$0.53K	\$0.55K	\$0.56K
3650 - Publications	\$0.00K	\$0.53K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3680 - Rates Paid	\$140.76K	\$145.29K	\$128.26K	\$131.85K	\$134.93K	\$138.14K	\$141.47K	\$144.93K	\$148.52K	\$152.24K	\$156.09K	\$160.20K
3710 - Recoverable Expenses	\$1.11K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3745 - Refunds	\$8.59K	\$0.00K	\$0.50K	\$0.51K	\$0.53K	\$0.54K	\$0.55K	\$0.57K	\$0.58K	\$0.59K	\$0.61K	\$0.62K
3780 - Rentals Paid	\$10.80K	\$10.80K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3800 - Resource Consents	\$29.51K	\$27.80K	\$40.67K	\$41.81K	\$42.78K	\$43.80K	\$44.86K	\$45.96K	\$50.57K	\$51.84K	\$53.15K	\$54.54K
3830 - Salaries and Wages	\$137.38K	\$137.92K	\$33.66K	\$34.19K	\$34.77K	\$35.37K	\$35.98K	\$36.62K	\$37.26K	\$37.93K	\$38.60K	\$39.31K
3832 - Casual staff/students/overti..	\$0.17K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3840 - Security	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3850 - Servicing and Repairs	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3880 - Training & Professional Develo	\$7.41K	\$5.00K	\$10.00K	\$10.28K	\$10.52K	\$10.77K	\$11.03K	\$11.30K	\$11.58K	\$11.87K	\$12.17K	\$12.49K
3886 - Accommodation/Travel	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3900 - Subscriptions	\$2.95K	\$1.50K	\$1.50K	\$1.54K	\$1.58K	\$1.62K	\$1.65K	\$1.70K	\$1.74K	\$1.78K	\$1.83K	\$1.87K
3970 - Telephones and Tolls	\$3.89K	\$4.60K	\$1.00K	\$5.14K	\$5.26K	\$5.39K	\$5.52K	\$5.65K	\$5.79K	\$5.94K	\$6.09K	\$6.25K
3975 - Mobile Phones Purchased	\$1.30K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
3980 - Travel & Accommodation	\$1.27K	\$1.00K	\$0.00K	\$1.23K	\$1.26K	\$1.29K	\$1.32K	\$1.36K	\$1.39K	\$1.42K	\$1.46K	\$1.50K
4020 - Vehicle Costs - Fuel Costs	\$0.94K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
4030 - Waste Disposal - Bins	\$0.60K	\$0.78K	\$0.75K	\$0.77K	\$0.79K	\$0.81K	\$0.83K	\$0.85K	\$0.87K	\$0.89K	\$0.91K	\$0.94K
4050 - Water Purchases	\$175.53K	\$180.00K	\$1.00K	\$1.03K	\$1.05K	\$1.08K	\$1.10K	\$1.13K	\$1.16K	\$1.19K	\$1.22K	\$1.25K
4070 - Water Sampling	\$72.99K	\$70.76K	\$96.55K	\$84.86K	\$86.84K	\$85.03K	\$87.08K	\$89.21K	\$91.42K	\$93.66K	\$95.92K	\$98.22K
4600 - Depreciation (Corp)	\$1,820.68K	\$1,880.57K	\$0.00K	\$48.30K	\$209.92K	\$250.06K	\$265.22K	\$325.07K	\$405.68K	\$437.97K	\$844.11K	\$899.06K
4601 - Depreciation Forecast	\$0.00K	\$0.00K	\$1,916.25K	\$2,024.64K	\$2,030.21K	\$1,969.95K	\$1,968.82K	\$1,961.64K	\$1,898.07K	\$1,859.56K	\$1,442.93K	\$1,413.17K
5002 - Overheads-Depreciation IT	\$4.94K	\$9.78K	\$14.80K	\$14.65K	\$15.39K	\$15.56K	\$24.94K	\$26.02K	\$27.49K	\$28.83K	\$24.61K	\$21.77K
5007 - Overheads-DepreciationCorp..	\$8.33K	\$9.42K	\$9.23K	\$9.50K	\$9.89K	\$10.09K	\$10.30K	\$10.42K	\$10.63K	\$10.86K	\$11.09K	\$11.34K
5009 - Overheads-DepreciationRec..	-\$6.98K	-\$11.85K	-\$16.68K	-\$16.65K	-\$17.64K	-\$23.86K	-\$27.28K	-\$28.30K	-\$29.82K	-\$31.21K	-\$27.04K	-\$24.26K
5012 - OvhDepnRechgd - OBU SW A..	\$52.02K	\$40.59K	\$50.44K	\$51.41K	\$54.25K	\$63.12K	\$68.29K	\$69.81K	\$72.48K	\$75.02K	\$70.26K	\$67.33K
5013 - OvhDepnRechgd - Water Ad..	\$6.98K	\$11.85K	\$16.68K	\$16.65K	\$17.64K	\$23.86K	\$27.28K	\$28.30K	\$29.82K	\$31.21K	\$27.04K	\$24.26K
5015 - Overheads-Communication	\$16.33K	\$16.65K	\$17.79K	\$17.46K	\$17.78K	\$18.13K	\$18.45K	\$18.79K	\$19.16K	\$19.52K	\$19.87K	\$20.26K
5026 - Overheads - Risk & Performa..	\$2.08K	\$2.20K	\$2.62K	\$2.75K	\$2.79K	\$2.85K	\$2.90K	\$2.95K	\$3.01K	\$3.06K	\$3.12K	\$3.18K
5030 - Overheads-Customer Services	\$8.15K	\$8.27K	\$8.67K	\$8.81K	\$8.96K	\$9.12K	\$9.28K	\$9.45K	\$9.62K	\$9.80K	\$9.98K	\$10.17K
5045 - Overheads - Infrastructure	\$21.57K	\$21.89K	\$21.20K	\$21.06K	\$21.42K	\$21.80K	\$22.18K	\$22.58K	\$22.99K	\$23.41K	\$23.83K	\$23.81K
5060 - Overheads-Executive Support	\$5.15K	\$5.81K	\$5.41K	\$5.50K	\$5.60K	\$5.70K	\$5.80K	\$5.91K	\$6.02K	\$6.13K	\$6.25K	\$6.37K
5070 - Overheads-Financial Services	\$85.07K	\$114.31K	\$99.30K	\$102.46K	\$112.27K	\$107.23K	\$109.70K	\$120.94K	\$114.82K	\$117.48K	\$129.40K	\$122.71K
5075 - Overheads-Rates&WaterPro..	\$213.86K	\$208.41K	\$188.15K	\$196.86K	\$200.57K	\$204.49K	\$208.52K	\$212.76K	\$217.00K	\$221.44K	\$226.01K	\$230.62K
5080 - Overheads-Human Resources	\$18.89K	\$20.62K	\$2.44K	\$2.49K	\$2.53K	\$2.58K	\$2.63K	\$2.68K	\$2.73K	\$2.78K	\$2.83K	\$2.86K
5082 - Overheads-Human Resources	\$0.00K	\$0.00K	\$4.55K	\$4.62K	\$4.70K	\$4.78K	\$4.87K	\$4.95K	\$5.04K	\$5.13K	\$5.22K	\$5.32K
5089 - Overheads-Contract Manage..	\$1.41K	\$0.00K	\$0.36K	\$0.36K	\$0.37K	\$0.37K	\$0.38K	\$0.39K	\$0.39K	\$0.40K	\$0.41K	\$0.41K
5091 - Overheads-Production Servic..	\$64.73K	\$65.76K	\$83.62K	\$82.02K	\$83.09K	\$83.30K	\$84.50K	\$86.01K	\$87.54K	\$89.69K	\$91.91K	\$94.52K
5092 - Overheads-Location Services	\$39.47K	\$52.47K	\$44.04K	\$45.60K	\$46.40K	\$47.25K	\$49.83K	\$50.76K	\$51.70K	\$54.67K	\$55.71K	\$56.79K
5104 - Overhead - Records Managem..	\$5.28K	\$5.61K	\$5.36K	\$5.22K	\$5.24K	\$5.26K	\$5.34K	\$5.33K	\$5.44K	\$5.44K	\$5.53K	\$5.61K
5108 - Overheads-Civic Centre	\$2.68K	\$3.79K	\$4.26K	\$4.63K	\$4.70K	\$4.78K	\$4.88K	\$4.94K	\$5.02K	\$5.11K	\$5.18K	\$5.28K
5109 - Overheads-Murupara Offices	\$0.89K	\$1.17K	\$1.26K	\$1.35K	\$1.38K	\$1.41K	\$1.44K	\$1.47K	\$1.51K	\$1.54K	\$1.58K	\$1.61K
5115 - Overheads-Valley Rd Bldg Ch..	\$14.33K	\$17.70K	\$22.71K	\$22.88K	\$23.23K	\$23.71K	\$24.33K	\$24.71K	\$25.20K	\$25.84K	\$26.24K	\$26.76K
5118 - Overheads-Museum Building	\$0.27K	\$0.36K	\$0.59K	\$0.84K	\$0.85K	\$0.86K	\$0.88K	\$0.88K	\$0.90K	\$0.91K	\$0.92K	\$0.93K
5133 - Overhead -3 Waters	\$0.00K	\$102.82K	\$98.48K	\$101.68K	\$103.40K	\$105.22K	\$107.06K	\$108.97K	\$110.89K	\$112.90K	\$114.93K	\$116.80K
5139 - Overheads-Water Admin	\$189.27K	\$312.15K	\$304.45K	\$308.34K	\$313.55K	\$317.53K	\$324.63K	\$330.76K	\$336.35K	\$345.01K	\$352.27K	\$358.64K
5141 - Overheads - 3 Waters Admin	\$337.87K	\$259.27K	\$324.56K	\$329.22K	\$335.06K	\$338.96K	\$345.15K	\$352.12K	\$358.02K	\$365.51K	\$374.15K	\$381.68K
5150 - Overheads - Recovery	-\$189.27K	-\$312.15K	-\$304.45K	-\$308.34K	-\$313.55K	-\$317.53K	-\$324.63K	-\$330.76K	-\$336.35K	-\$345.01K	-\$352.27K	-\$358.64K
5870 - Interest - Internal Borrowing	\$391.31K	\$500.71K	\$460.17K	\$551.78K	\$653.11K	\$702.11K	\$752.65K	\$788.43K	\$816.58K	\$816.25K	\$799.47K	\$774.41K
5871 - Interest 2018 - Int Borrowing	\$0.00K	\$0.13K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K
5999 - Job Clearing Account Expendi..	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K	\$0.00K

7.5 Revenue

The revenue for 2017 to 2018 and for the next 10 years forecast are shown in Figure 19 below.

**Figure 19: revenue Forecast from 2019 to 2018**



## 8 Plan Implementation

The Council recognises that this AMP is a “living” document in need of constant monitoring, change and improvement.

### 8.1 Back to Basics

The goal of asset management is:

*To meet a required level of service, in the most cost effective manner, through the management of assets for present and future customers.*

To achieve this goal it is important that the Council is clear on the appropriate scope of the asset management system and has a clear path towards the end goal. The Council is the service provider for the potable reticulated water supply function, and the primary goal is meeting customers’ requirements in a sustainable manner. Recognising the need for collaboration with multiple stakeholders, keeping a strong commitment to community engagement and providing educational material is an important part of asset management principles.

### 8.2 Asset Management Improvement Process

The past two versions of the AMP have been treated as ‘shelf documents’ deliverable every three years. However due to a fundamental mind-set change within the Council, this AMP is based on a “live asset management document” and will be continually updated with record changes, improvements and achievements.

The Council has adopted a strategic management approach to improvement planning, developing AMPs, implementing improvement processes and associated practices. This Improvement Plan is integral to that approach, quantifying current business practice and measuring progress toward an identified future position. The Improvement Plan includes:

- The cycle of AMP monitoring, review, revision and audit to improve the effectiveness of AMP outputs, and compliance with audit criteria, legislative requirements and best appropriate practice
- The definition of service standards reflecting community outcomes through public consultation. The AMP is used to identify service level options and costs, and the delivery of services is a key objective of asset management planning.
- Identifying and prioritising ways to cost-effectively improve the quality of the AMP and therefore decision making and service delivery.
- Identifying the indicative time-scales, priorities, human and financial resources required to achieve Asset Management planning objectives.

The development of this AMP is based on existing levels of service, the best available current information and the knowledge of the Council’s staff. It is intended that the development of this plan is part of an ongoing process and that the document will be reviewed and updated regularly. This review process involves using improved knowledge of customer expectations

(community consultation) and information from Asset Management Systems and databases. This will enable the Council to optimise decision-making, review outputs, develop strategies, improve risk management and extend the planning horizon.

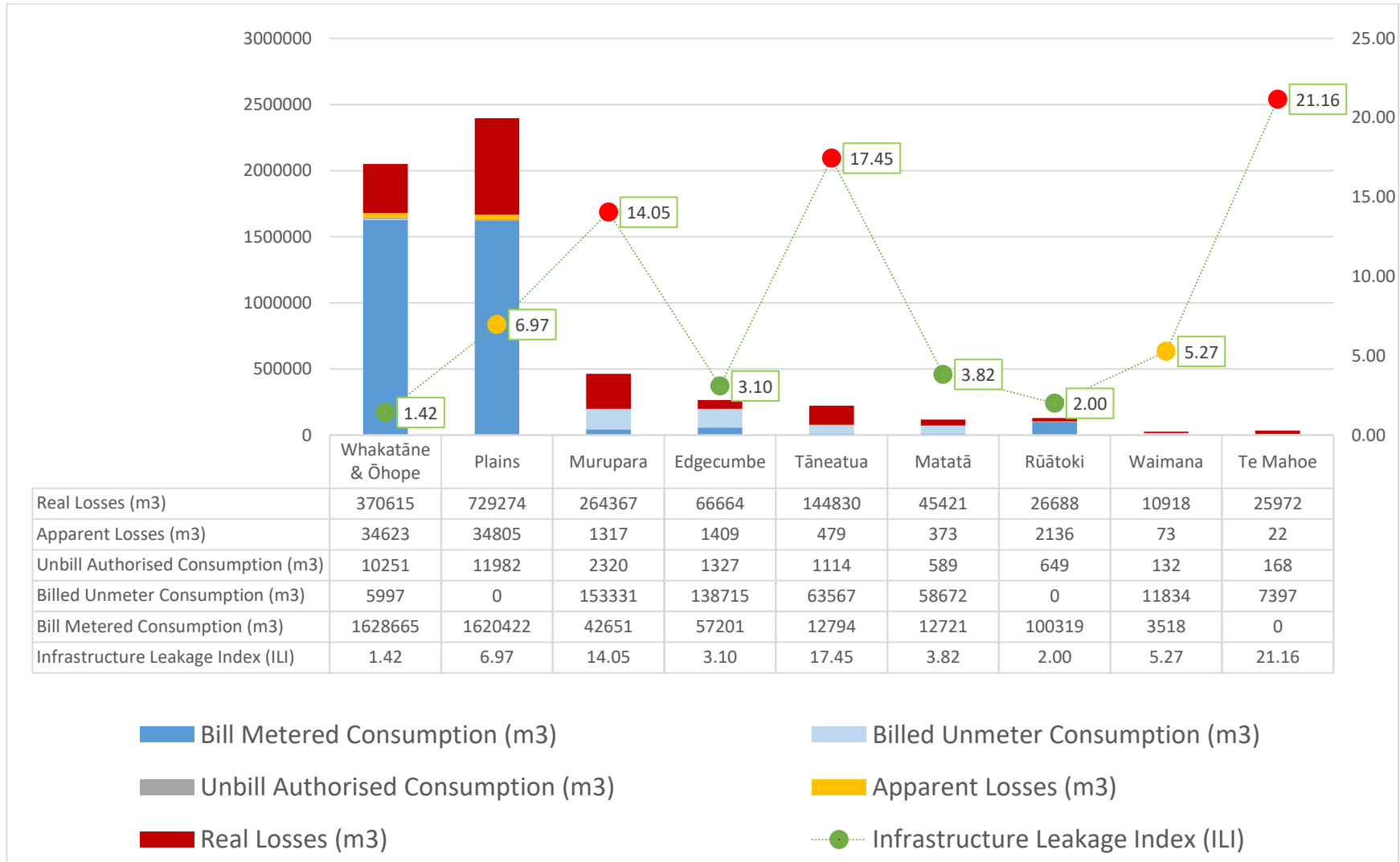
### 8.3 **Guideline and Standards**

This AMP has referred to the International Infrastructure Management Manual – International Edition 2015. The Council will monitor the application of ISO 55000 over the coming years and will use it as a guidance of best practice in the future.

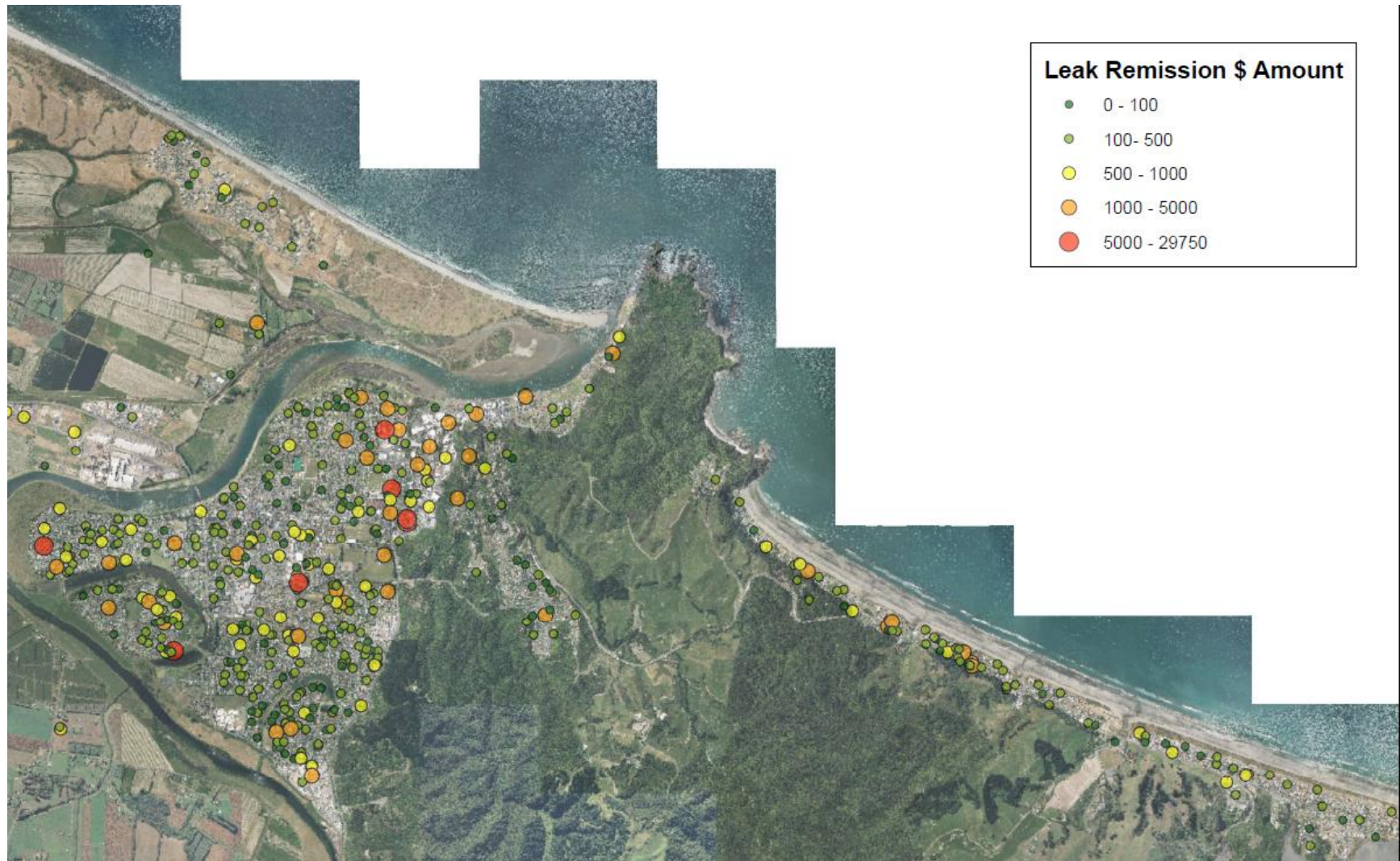
### 8.4 **AMP Review and Monitoring**

This AMP will continue to be developed over time to incorporate future advance asset management techniques, make use of improved data collection and management system, responses to legislative and policy changes, and address evolving issues. To date, this document has not been reviewed however, a review for compliance with the requirements of the relevant legislation, especially the LGA 2002 shall be a primary improvement item.

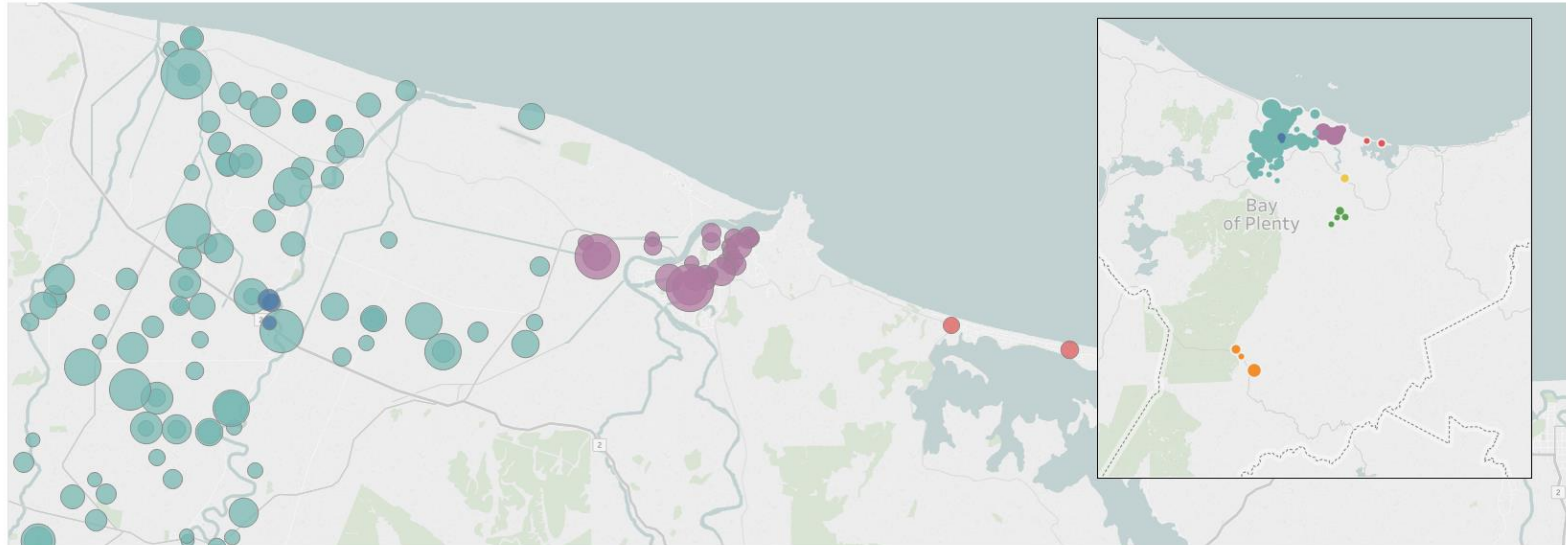
## Appendix 1 Water Balance Report 2017



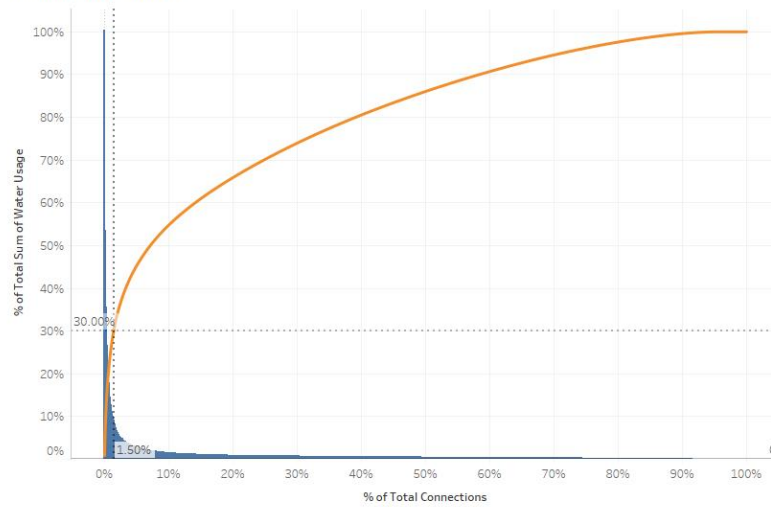
### Appendix 2 Leak Remission on Customer from 2014 to 2017 April



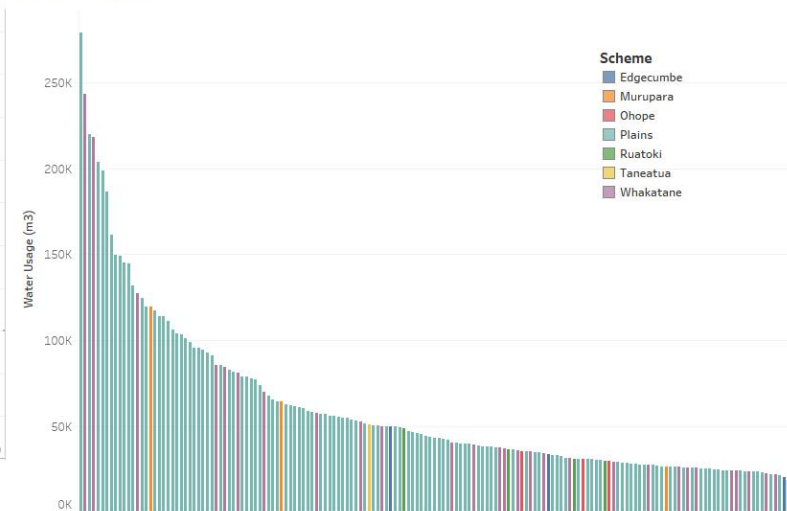
### Appendix 3 The Biggest Metered Users in Whakatāne District (2007-2017)



User Pareto Charts



First 1.5% User





## Appendix 4 Projects Forecast

Project Name	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Grand T..
OHOPE W-Supply Main from Ngati	\$500K										\$500K
WHK W MAINS RENEWAL	\$400K	\$51K	\$316K	\$162K	\$221K	\$226K	\$232K	\$237K	\$183K	\$375K	\$2,401K
W11 Whakatane Riverbank Filtra	\$300K	\$2,056K									\$2,356K
W5.2 & 7.3 WSP works - include	\$300K	\$46K		\$323K	\$55K						\$725K
W2.5 & 16 Plains water supply	\$130K										\$130K
Otumahi additional watermains	\$100K	\$257K									\$357K
W 17 Data Verification - data	\$95K	\$15K									\$110K
W 2.4 Water losses and leak de	\$90K										\$90K
W 5.2 & 7.3 WSP works - power	\$88K	\$51K	\$32K	\$32K	\$33K	\$34K	\$35K				\$305K
Otumahi W5.2 & 7.3 WSP works -	\$50K										\$50K
MURUPARA W Pipe Replacement	\$50K			\$183K		\$170K					\$403K
W13 Replacement of Water Take	\$50K	\$21K			\$22K	\$23K	\$23K	\$24K	\$24K	\$144K	\$330K
W 5.2 & 7.3 WSP works - bore h	\$40K	\$123K	\$126K								\$290K
W 5.2 & 7.3 WSP works - source	\$23K	\$151K	\$179K								\$353K
W 5.2 & 7.3 WSP works - RPZ at	\$20K										\$20K
WHK W WTP MINOR EQUIP. RENEWAL	\$20K	\$21K	\$21K	\$22K	\$22K	\$23K	\$23K	\$24K	\$24K	\$25K	\$224K
WHK W - Electrical Installatio	\$15K	\$2K	\$2K	\$2K	\$2K	\$2K	\$29K	\$2K	\$2K	\$2K	\$62K
WHK W Minor Retic Replacem	\$15K	\$15K	\$16K	\$16K	\$17K	\$17K	\$17K	\$18K	\$18K	\$19K	\$168K
OHOPE W CONN. & METER REPL.	\$14K	\$14K	\$77K	\$52K	\$53K	\$55K	\$16K	\$16K	\$11K	\$11K	\$319K
Te Mahoe Water Improvements	\$10K	\$31K	\$32K						\$18K	\$9K	\$100K
WHK W PIPE SAMPLING PROGRAMME	\$10K			\$32K			\$17K			\$37K	\$97K
W2.5 & 16 Otumahi water supply	\$10K										\$10K
EDG W Pipe Sampling Prog	\$6K			\$10K			\$7K			\$11K	\$34K
MURUPARA W PIPE SAMPLING PROGR	\$6K			\$6K			\$3K			\$7K	\$23K
MATATA W Replace Mains	\$5K	\$41K		\$121K			\$46K			\$50K	\$263K
WHK W CONNECT REPLACE & METER	\$5K	\$9K	\$205K	\$5K	\$10K	\$43K	\$31K	\$16K	\$41K	\$19K	\$383K
WTP Minor Equipment Renewal	\$4K		\$4K		\$4K		\$5K		\$37K	\$19K	\$72K
MATATA W PIPE SAMPLING PROGRAM	\$3K			\$6K			\$3K			\$7K	\$20K
PLAINS W PIPE SAMPLING PROGR.	\$3K			\$6K			\$3K			\$7K	\$20K
TANEATUA W PIPE SAMPLING PROGR	\$3K			\$6K			\$3K			\$7K	\$20K
OHOPE W- Asset Condition Asses	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$28K
WTP - Minor Equipment Renewal	\$3K		\$3K	\$2K	\$3K		\$3K		\$18K	\$9K	\$41K
PLAINS W - Minor Replacements	\$2K		\$2K		\$2K		\$2K		\$2K	\$31K	\$42K
Rua W - Asset Condition Assess	\$1K			\$1K			\$1K		\$1K		\$3K
Edg W - Reticulation Minor Ren		\$5K			\$6K			\$6K			\$17K
EDG W-Replace Connections/mete					\$4K						\$4K
EDGE CUMBE W WATER MAIN REPL.		\$154K				\$170K			\$243K		\$567K
MATATA W Replace Meter/Connect			\$1K	\$1K	\$1K	\$1K	\$1K				\$3K
MURUPARA W Connection Repl & M					\$4K						\$4K
Ohope additional water renewals mains hydrants..		\$51K									\$51K
Ohope Pipe Sampling Programme				\$6K			\$3K			\$7K	\$17K
Ohope timber reservoir replacement										\$625K	\$625K
Ohope W - Minor Renewals		\$5K			\$6K			\$6K			\$17K
Ohope W- Upgrade Pipes Harbour							\$753K				\$753K
Plains W - Whk Sludge Treatmen					\$55K	\$848K					\$903K
PLAINS W MAINS RENEWAL (PROV)			\$158K		\$276K	\$57K					\$490K
Pump Replacement (Routine)		\$15K					\$17K				\$33K
Rua W - Electrical & Tele repl			\$16K								\$16K
Taneatua additional water renewals mains hydra..		\$15K				\$170K					\$185K
TANEATUA W Repl Meter/Connectn						\$4K					\$4K
Te M W - Connection Renewals									\$30K		\$30K
Te Mahoe additional water renewals mains hydra..					\$44K						\$44K
Te Mahoe Pipe Sampling Programme				\$3K							\$3K
W 2.3 water meter installation programme for un..		\$557K									\$557K
W 2.4 Water losses and leak detection		\$82K	\$26K	\$86K	\$6K						\$200K
W 17 Data Verification - data capture - Condition ..			\$32K	\$16K	\$17K	\$17K		\$53K	\$18K	\$19K	\$172K
W 18 additional water renewals mains hydrants v..										\$75K	\$75K
W 20 Condition and Improvements - Reservoirs		\$406K	\$2,683K	\$2,482K	\$552K	\$1,695K	\$1,158K	\$594K			\$9,569K
W2.3 Whakatane water meter programme for un..		\$16K									\$16K
W2.5 & 16 Matatā water supply scheme update m..			\$11K								\$11K
W2.5 & 16 Murupara water supply scheme updat..				\$11K							\$11K
W2.5 & 16 Ōhope water supply scheme update m..			\$42K								\$42K
W2.5 & 16 Tāneatua water supply scheme update..				\$11K							\$11K
W2.5 & 16 Whakatane water supply scheme upda..		\$108K									\$108K
W13 Replacement of Water Take resource Consent				\$32K	\$88K	\$90K	\$93K	\$95K	\$97K	\$250K	\$746K
W13 Whakatane Replacement of Water Take reso..							\$46K	\$47K	\$49K	\$250K	\$392K
W14 Matata Hydrogeological Study					\$132K						\$132K
W14 Murupara Hydrogeological Study					\$132K						\$132K
W14 Plains Hydrogeological Study					\$276K						\$276K
W14 Whakatane Hydrogeological Study					\$540K						\$540K
Waimana additional water renewals mains hydra..								\$59K			\$59K
Waimana Pipe Sampling Programme				\$3K						\$4K	\$7K
Waimana W - Reservoir Upgrades		\$308K									\$308K
Water treatment plant minor equipment renewals								\$2K	\$18K	\$9K	\$30K
Whk Water - WTP Building Upgr			\$105K								\$105K
Whk Water-Coastlands Link Main					\$276K	\$283K					\$558K
WTP Filter Covering			\$105K								\$105K