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APPENDIX A. LEGISLATIVE AND OTHER REQUIREMENTS AND RELATIONSHIPS WITH OTHER PLANNING DOCUMENTS AND ORGANISATIONS

A.1 Introduction

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

The AMP demonstrates responsible management of the district's assets on behalf of customers and stakeholders and assists with the achievement of strategic goals and statutory compliance. The AMP combines management, financial, engineering and technical practices to ensure that the levels of service required by customers is provided at the lowest long term cost to the community and is delivered in a sustainable manner.

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

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

This plan outlines and summarises the Council's strategic and management long-term approach for the provision and maintenance of potable water[1] supplies to properties throughout the district (excluding those that service single premises that have their own rainwater tanks or bores) - whether they be provided by public or private means.

The front section of this AMP document is produced with the aim of the target audience being Council staff and Councillors. The Appendices provide more in depth information for the management of the activity and are therefore targeted at the Activity Managers. The entire document is available within the public domain.

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

- **National Drivers** – for example the drivers for improving Asset Management through the Local Government Act 2002, and drivers for improved drinking water quality through the Health (Drinking Water) Amendment Act 2007.
- **Local Drivers** – for example the Community Outcomes determined through consultation with the public, and increasing scarcity of water and demand for more.
- **Linkages** – the need to ensure this AMP is consistent with all other relevant plans and policies.
- **Constraints** – the legal constraints and obligations Council has to comply with in undertaking this activity.

The main Drivers, Linkages and Constraints are described in the following sections.

A.2 Key Legislation, Industry Standards and Statutory Planning Documents

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

[1] 'Potable water' is water that is suitable for use by humans as drinking water.

A.2.1. Acts

- The Health Act 1956
- The Health (Drinking Water) Amendment Act 2007 (an amendment of the Health Act 1956)
- The Local Government Act 2002, especially
  - Part 7
  - Schedule 10
  - The requirement to consider all options and to assess the benefits and costs of each option
  - The consultation requirements (see Appendix 'U').
- The Climate Change Response Act 2002
- The Civil Defence Emergency Management Act 2002 (Lifelines)
- The Resource Management Act 1991
- The Local Government (Rating) Act 2002
- The Health and Safety in Employment Act 1999
- The Building Act 2004
- The Consumer Guarantees Act 1993
- The Sale of Goods Act 1908
- The Fair Trading Act 1986

For the latest Act information refer to http://www.legislation.govt.nz/.

A.2.2. National Policies, Regulations, Standards and Strategies

- Drinking Water Standards for New Zealand 2005 (Revised 2008)
- The Government's Sustainable Development Action Plan
- The National Environmental Standard Sources of Human Drinking Water
- Code of Practice for Urban Sub-division
- The New Zealand Fire Service Fire Fighting Water Supplies Code of Practice: SNZ PAS 4509:2008
- NAMS Manuals and Guidelines http://www.nams.org.nz
- Office of the Auditor General's publications http://www.oag.govt.nz

A.2.3. Standards New Zealand (for all refer to http://www.standards.co.nz)

- AS/NZS ISO 31000:2009 Risk Management Principals and Guidelines
- NZS 4404:2010 Land Development and Subdivision Infrastructure
- AS/NZS ISO 9001:2008 Quality Management Systems
- AS/NZS 4801:2001 Occupational Health and Safety Management Systems

A.2.4. Local Policies, Regulations, Standards and Strategies

- Council's District Plan – Tasman Resource Management Plan (TRMP) http://www.tasman.govt.nz
- Tasman Regional Policy Statement (TRPS) http://www.tasman.govt.nz
- Tasman District Council Engineering Standards and Policies 2008 http://www.tasman.govt.nz
- Council's Procurement Strategy.

Council has several statutory planning documents implementing its responsibilities under the Resource Management Act 1991. Those which impact on the provision of Council water services are:

(1) *Tasman Regional Policy Statement (TRPS)* operative 2001
An overview of significant resource management issues with general policies and methods to address these.

(2) *Tasman Resource Management Plan (TRMP)*
A combined regional and district plan with statements of issues, objectives, policies, methods and rules addressing the use of land, water, coastal marine area and discharges into the environment. This plan largely supersedes the Tasman District Transitional District Plan (comprising the Waimea, Golden Bay, Motueka and Richmond planning schemes).

(3) *Motueka-Riwaka-Plains Water Management Plan* operative 1995

(4) *Moutere Water Management Plan* operative 2001

(5) *Regional Plan (Land)* operative 1998
The Regional Plan (Land) is superseded by Chapter 12 and Section 18.6 of the TRMP.

Water management plans (3) and (4) are superseded by Part V of the TRMP, notified with effect from November 2001. The Regional Plan (Land) is superseded by Chapter 12 and Section 18.6 of the TRMP.

These plans guide the processing of resource consent applications for water abstraction from water bodies, and for some land disturbance or waterway interferences that may be associated with water supply reticulation. The plans therefore may impact on the amount of water available for public supplies in various locations, the method of water abstraction and the location, design and construction of reticulation networks. The plans also specify requirements for onsite water supply.

In addition to legislative requirements, the following additional guidelines/standards also influence water supplies.

- ***New Zealand Code of Practice for Fire Fighting Water Supplies 2008*** – defines flow and pressure standards for fire fighting.
- ***NZS 4404 (Code of Practice for Urban Subdivision)*** – sets minimum water supply pressures and flows (for both service delivery and fire fighting).
- ***Tasman District Council Engineering Standards*** – set out standards for the design of engineering works associated with the development of urban supplies, eg. material types, capacity of pipes.
- ***Guidelines for Drinking Water Quality Management for New Zealand 2005***

A.3 Links with Other Documents

This AMP is a key component in the Council's strategic planning function. Among other things, this plan supports and justifies the financial forecasts and the objectives laid out in the Long Term Plan (LTP). It also provides a guide for the preparation of each Annual Plan and other forward work programmes.

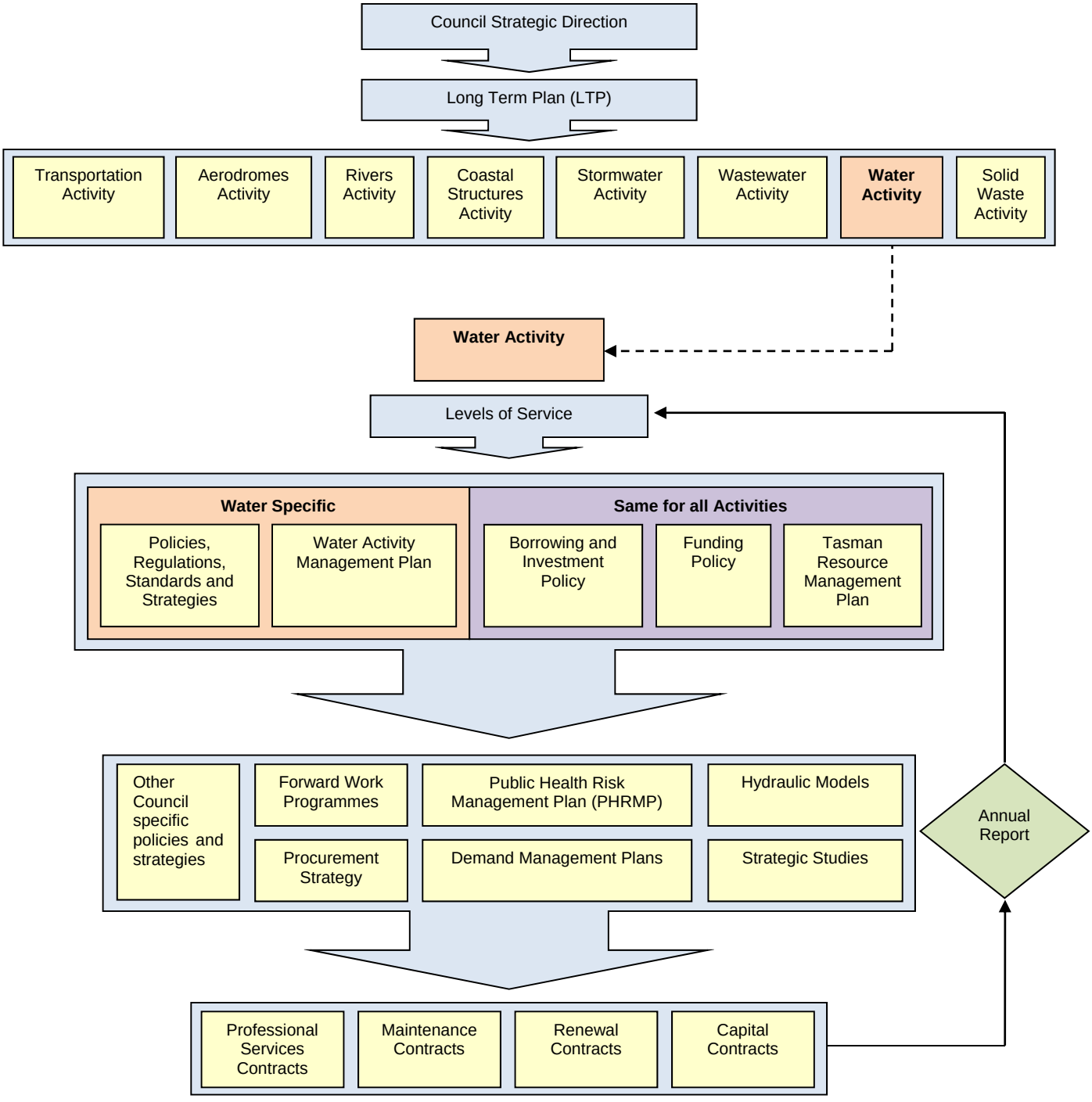


Figure A-1: Hierarchy of the Council's Policy, Strategy and Planning

A.4 Strategic Direction

Council Strategic Direction is outlined in the Vision, Mission and Objectives of the Council:

Vision: An interactive community living safely in the garden that is Tasman district.

Mission: To enhance community wellbeing and quality of life.

Objectives:

Objective 1:
To implement policies and financial management strategies that advance the Tasman district.

Objective 2:
To ensure sustainable management of natural and physical resources, and security of environmental standards.

Objective 3:
To sustainability manage infrastructural assets relating to Tasman district.

Objective 4:
To enhance community development and the social, natural, cultural and recreational assets relating to Tasman district.

Objective 5:
To promote sustainable economic development in the Tasman district.

The following table outlines the strategic documents utilised by the Council as part of the planning process.

Table A-1: Strategic Documents Utilised During the Planning Process

Long Term Plan (LTP)	The primary instrument for the Council to report on its intentions on delivering its services to the community. This is the broad strategic direction of council set in the context of current and future customer requirements. The AMP is the tactical plan with a view to achieving the strategic targets. The LTP supersedes the Long Term Financial Strategy (LTFS) and traditional Annual Plan.
Annual Plan	The service level options and associated costs developed in the AMP will be fed into the Annual Plan consultation process. The content of the Annual Plan will feed directly from the short term forecasts in the LTP.
Financial and Business Plans	The financial and business plans requirement by the Local Government Amendment Act (3). The expenditure projections will be taken directly from the financial forecasts in the AMP.
Contracts	The service levels, strategies and information requirements contained in the AMP are the basis for performance standards in the current Maintenance and Professional Service Contracts.
Operational Plans	Operating and maintenance guidelines to ensure that the network operates reliably and is maintained in a condition that will maximise useful service life of assets within the network.
Corporate Information	Quality asset management is dependent on suitable information and data and the availability of sophisticated asset management systems which are fully integrated with the wider corporate information systems (eg. financial, property, GIS, customer service, etc). Council's goal is to work towards such a fully integrated system.

A.4.1. Our Goal

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

APPENDIX B. OVERVIEW OF THE ASSETS

B.1 Introduction

Throughout the district there are three categories of water supply; Urban Supply, Rural Supply and Community Supply.

The 11 urban water supplies in the Tasman district are:

- Richmond
- Waimea
- Mapua / Ruby Bay
- Wakefield
- Brightwater/Hope
- Kaiteriteri
- Tapawera
- Murchison
- Upper Takaka
- Collingwood
- Pohara Valley.

The rural water supplies include:

- 88 Valley
- Dovedale
- Redwood Valley.

Rural water supplies are low flow schemes serving rural areas. Each property on the scheme draws water through a restrictor into their privately owned tank. The restrictor limits the flow to a trickle feed equal to their allocation over 24 hours. The tank provides a balancing volume for the properties domestic and, at times, stock demands.

Because the scheme is restricted, the flows are low. Therefore, the systems have typically small diameter pipelines that travel long distances and often cross-country. They do not provide fire fighting capability.

There is currently an embargo on any new connections to the rural water supply schemes and a waiting list is in place for future connections.

The community schemes include:

- Motueka
- Hamama.

The community schemes are on-demand schemes (ie. not restricted) that receive a very similar level of service to the urban water supplies (refer to Appendix B2). The main difference between the urban and the community schemes is that connection is voluntary in the community schemes. In the urban schemes, all properties within the water supply area have to pay water rates irrespective of whether water is being used.

B.1.1. Impact of Health (Drinking Water) Amendment Act 2007

The Health (Drinking Water) Amendment Act 2007 (HDWAA) came into effect 1 July 2008. This means that compliance with drinking water standards is a legal requirement for Council. The relevant standard that Council intends to comply with is the Drinking Water Standards for New Zealand (DWSNZ) 2005 (revised 2008). Significant treatment upgrades are therefore required for supplies that are not from secure groundwater sources. Similarly, a higher level of water quality monitoring will be required.

It is a requirement to complete a Public Health Risk Management Plan (PHRMP) for each water supply scheme. The timeframes for completing the PHRMPs is shown in Appendix F. Council must take all practicable steps to ensure that a PHRMP is approved within 12 months of the date specified. Council shall start to implement a PHRMP within a month of its approval.

Provisions have been made in the financial forecasting to upgrade all treatment plants not currently complying with the DWSNZ. However, some of these upgrades may not meet the timeframes due to monitoring, investigations required or new sources to be identified and developed. In these cases Council may be able to negotiate timeframes with the Ministry of Health (MoH) by demonstrating they are taking "all practical steps" to comply.

B.1.2. Levels of Service

A detailed summary of Council's performance against the current levels of service (LoS) is included in Appendix R. Throughout this Appendix, the performance of each water scheme against the key level of service is summarised.

The key level of service for each water scheme has been identified as follows:

- LoS 2 – water demand management plans are in place for each water scheme
- LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ
- LoS 8 – PHRMPs are in place, approved and being implemented for each water supply
- LoS 9 – urban water supplies meet fire fighting standards – not applicable to rural and community supplies
- LoS 13 – hydraulic models are in place for key urban water supplies
- LoS 17 – water supply systems have the necessary storage not applicable to community supplies.

B.1.3. General Data Sources

Note that wherever DWSNZ is noted in the text, the Drinking Water Standards, NZ 2005 (revised 2008) are referred to.

P1 refers to Priority 1 determinands, which are determinands whose presence can lead to major and rapid illness outbreak, such as *E.coli.*

P2 refers to Priority 2 determinands which are determinands of public health significance. In this section, P2 refers to nitrate, lead and nickel only.

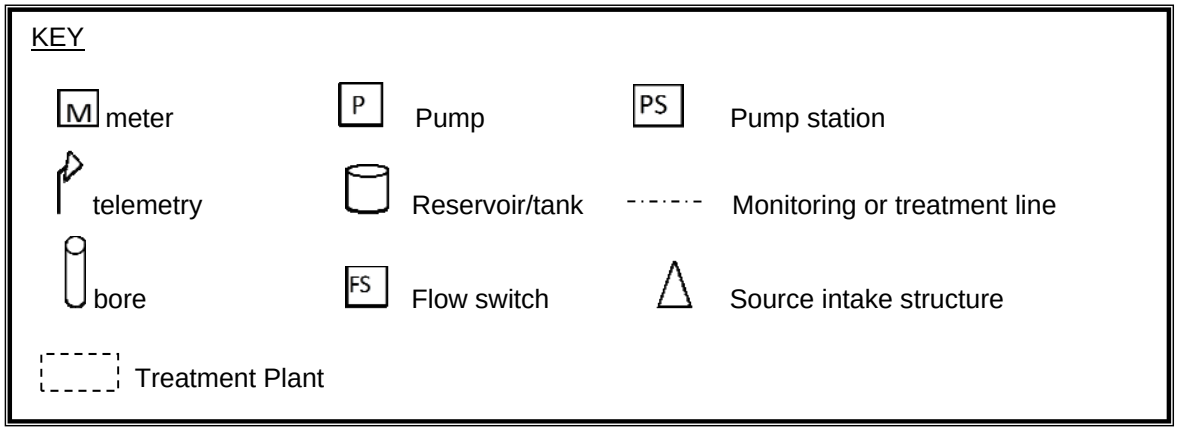
September 2011 data from the Confirm database has been used to populate the Register of Assets.

The following data sources have been used to calculate/collate the data in sections B2- B3.3:

- May 2011 restrictor check register (provided by maintenance contractor, Downer NZ Ltd (Downer).
- June 2011 metered water billing figures are used where available. December 2010, where not (Tasman District Council).
- WINZ database maintained by MWH New Zealand Ltd as at 30 June 2011.
- PHRMP status as of August 2011.
- Water abstraction data (from meters at treatment plants) is generally from July 2010 to June 2011 where available or from December 2009 to December 2010 where not.

- To calculate unmetered water use by restricted connections, 80% of daily allocation is assumed.
- The current population rate used to determine population density is 2.4 people per property.
- Annual average demand calculated from the operations and maintenance contractor weekly reading data is determined as being from about December 2009 to about December 2010 for most schemes. Approximately 365 days of consecutive data is used where possible.
- Average summer demand calculated from the operations and maintenance contractor weekly reading data is determined as being from the beginning of October 2010 to the end of March 2011, with the exception of the Wakefield scheme where meter readings were used from the beginning of October 2009 to the end of February 2010 as the meter readings for most of 2010 were inaccurate because of a fault.
- Average winter demand calculated from the operations and maintenance contractor weekly reading data is determined as being from beginning of April 2010 to the end of September 2010, with the exception of the Wakefield scheme which meter readings were used from the beginning of April 2011 to the beginning of August 2011 as the meter readings for most of 2010 were inaccurate because of a fault.
- Peak demand figures for each system are calculated from the seven day average of what has been determined as the point of highest demand during a particular year (2010 to 2011).

Each site has a schematic at the end of each section to show the basic processes of treatment, monitoring and reticulation. The key below details the figures used in these diagrams.



B.2 Urban Water Supplies

B.2.1. Richmond Water Supply

B.2.1.1 System Description

Richmond township is Tasman District Council's largest urban area with a population of approximately 11,200 people. The Richmond water scheme supplies approximately 7ML per day. The area has experienced significant growth rates, both in residential and commercial development over recent years. This in part has led to an issue with available water quantity and summer time restrictions.

The source water for the Richmond water supply comes from several sources:

- four Lower Queen Street bores
- one Appleby bore
- Roding Dam supply (Nelson City Council), only 10 m^3 per day
- Waimea bores located near the Waimea River which can supply the Richmond zone in an emergency after treatment at the Waimea Water Treatment Plant.

The original water supply scheme in Richmond operated from the beginning of the 20th century supplied by a small dam at the head of Reservoir Creek. In the early 1940s the Roding Dam water supply scheme was constructed to augment supplies in the growing district. The Reservoir Creek supply no longer operates, but the Roding Dam, now owned and operated by Nelson City Council, still supplies 10m^3 per day to Richmond. The agreement provides for 909m^3 per day, but due to the high cost of the water, Tasman District Council only take 10m^3 to maintain the water right and prevent stagnation of the water within the connection pipeline. However this can be an emergency supply of water.

In the early 1970's a new scheme was constructed to further augment supplies which included four wells in Lower Queen Street and a supplementary well at Appleby, all approximately 30m deep. There are two main reservoirs at the upper end of Queen Street.

The Richmond supply serves a mix of urban and rural lifestyle/agricultural properties with few commercial properties. There are 4,614 metered connections (June 2011) and 48 restricted rural connections (May 2011).

B.2.1.2 System Operation Overview

The groundwater drawn from the four wells at Lower Queen Street is from the Lower Confined Aquifer (LCA). The aquifer is considered secure (although not yet approved by the MoH) and the water is pumped directly into the public supply with no treatment. The untreated groundwater is pumped directly into an area of reticulation known as the 'low pressure zone' (which includes the low lying areas of Richmond) and also to the lower of the two Queen Street reservoirs.

From the lower Queen Street reservoir, water is pumped up the hill to a second reservoir which supplies the 'high pressure zone' (above Wensley Road and Hill Street). Cropp Place and Valhalla Drive are both supplied by booster pumps with storage tanks at the top end of the zones. Rural connections in Hill St South and Haycock Road are supplied from a booster pump and storage tank on the corner of Hill Street and Hart Road.

The water level in the upper of the two Queen Street reservoirs controls the operation of the pumps. A control building with electrical control circuitry exists in the Lower Queen Street area adjacent to the well field. The flow meter is not connected to telemetry but meters are read weekly. There are a number of laterals/off takes from this water main and consequently during periods when the pumps are off, water flows back from the reservoir into the reticulation via the rising/falling main.

The Appleby well pump and the Roding water supply operate continuously. To minimise the possibility of reservoir overflow (which can happen if the Appleby supply exceeds demand) the Queen Street well pumps turn off when the reservoir is 1m below top water level.

Some of the metered connections in Richmond North are actually on the Waimea scheme supply. These connections have been taken into account and not included in the total number of metered connections for Richmond but have been added to the total number of metered connections on the Waimea supply. The Waimea reticulation network normally operates with valves closed where the system joins the Richmond water supply. As Richmond has grown, more use has been made of this Waimea trunk main which has reduced the demand on the Richmond well field.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.1.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment as critical are:

- Richmond Network – at extreme risk to earthquake during and immediately after the event.
- Richmond Wells – at risk to flooding and/or inundation.

B.2.1.4 Compliance with Levels of Service

LoS 2 – water demand management plans are in place for each water scheme.

- A demand management plan is in place for Richmond.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been three P1 (bacterial) non compliances in the last five years in the zone and one at the Appleby bore. There have been 19 P2 non compliances in the Richmond zone in the past five years due to high levels of nitrate.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Richmond has an approved PHRMP.

LoS 9 – urban water supplies meet fire fighting standards.

- The vast majority of Richmond complies, with the exception of Lower Queen Street, Appleby Highway, Hebberd Place, Gilbert Street, Warren Kelly Street, Sutton Street, Hill Plough Heights, Cropp Place and Appaloosa Avenue.

LoS 13 – hydraulic models are in place for key urban water supplies.

- Richmond has a hydraulic model.

LoS 17– water supply systems have the necessary storage.

- Richmond does not have sufficient storage.

B.2.1.5 Asset Condition Overview

The system comprises:

- five well pumps
- three booster pump stations (Cropp Place pump station, Valhalla Drive Booster pump station, Hill Street South pump station)
- High Level Pressure Zone
- Low Level Pressure Zone
- High Level Reservoir
- Low Level Reservoir
- three micro-zone reservoirs.

The condition of most of the pipework in the system is average. There are areas of pipe which are causing problems and many of the copper rider mains are coming to the end of their life. There have been 14 breaks in AC mains during the past year, six in Fauchelle Avenue, two in Appleby Highway near Three Brothers Corner, and one each in Beach Road, Gladstone Road, Florence Street, Church Street, Talbot Street and Hill Street.

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

The bores have recently been upgraded to be more in line with DWSNZ but may require further upgrade to be classified as secure.

The construction of a new treatment plant for the blending and treatment of water from both the Waimea and Richmond sources has been identified as a strategic approach to managing issues with these water sources. Specifically, the mixing of water sources will dilute the high nitrate levels in the Richmond source and dilute the corrosiveness of the Waimea source.

B.2.1.6 Water Quality and DWSNZ Compliance

Required sampling - Richmond supplies approximately 11,200 people, making it a 'large' supply (>10,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and the distribution zone to be sampled for *E.coli* and nitrate. As the bores have not yet officially been classed as secure, monitoring compliance 'Criterion 1' should be used at the treatment plant which would require the plant water to be sampled every day. As the bore abstracts water from a confined aquifer (which has been aged), the monitoring criteria that is instead used is 'secure groundwater'. This requires monitoring once a month.

Monitoring in the zone is carried out using 'Criterion 6A' (in compliance with the DWSNZ), which requires monitoring approximately three times a fortnight. Nitrate is monitored in the zone three times per quarter.

The treatment plants are located at the Appleby bore site and also at a site known as 'Cargill's Corner' which is downstream of the four Queen Street bores. Both of these sites have online turbidity, pH and UVT analysers which are connected to telemetry.

Historical results - Between June 2006 and June 2011, 764 samples were taken from the zone. Three of these were transgressions; however none of the follow up samples revealed any contamination. Seventy one samples were taken from the Appleby plant, one of which was a transgression. Seventy six samples were taken from Cargill's Corner, with no transgressions.

Ninety one samples were analysed for nitrate in the zone. Eighty three of these were above the maximum acceptable value (MAV). This issue will be resolved on completion of the proposed Richmond Water Treatment Plant.

B.2.1.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater at both sites.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Richmond	GW	Four bores at Lower Queen Street. One bore at Appleby.	NN960432	01/09/1998	31/05/2016

B.2.1.8 Current and Future Demands

The current demand for Richmond is met by the Richmond supply, but water restrictions have been imposed to some degree most summers. There is the opportunity to provide emergency supply from the Richmond scheme to Brightwater.

The Waimea Basin is short of water, this is due to over allocated water takes, insufficient water for environmental needs and water rationing.

The current demand and projected demand is summarised in the Table B-1 below.

Table B-1: Current Demand of Richmond Water Supply

Source	Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Average Annual Demand (m^3/d)	Maximum Daily Demand (m^3/d)
Appleby Well	7,273 Combined	901	911	911	5,737 Combined
Lower Queen Street Wells		3,772	2,662	3,096	
Nelson supply	909	10	10	10	10

The zonal boundary between Waimea and Richmond supply is being altered to better utilise the storage capacity of the Champion Road Reservoir.

The future supply of the Richmond zone will become a blended mix of Richmond and Waimea sources. The zone will not be solely reliant on the Richmond supply. Therefore the Richmond supply and Waimea supply will no longer exist as separate supplies.

It is anticipated that in 2029 the demand in the township of Richmond is as follows:

- Average Day Demand – 8,769m^3/day.
- Peak Day Demand – 17,539m^3/day.

To manage the growing demand in the township of Richmond, Council are taking the following key measures:

- a new treatment plant where Richmond and Waimea supply are blended together and distributed across the whole town
- potentially sourcing water from the proposed Lee Valley Dam
- new water source to be used in addition to existing sources
- demand management measures - refer to Appendix N for more detail
- upgrading and extending the network.

B.2.1.9 Strategic Studies

Various strategic studies have been undertaken to date for the Richmond water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond Water Supply Network Model – 2011.
- Richmond and Brightwater/Hope Water Demand Management Plan – August 2010.
- Richmond Public Health Risk Management Plan – June 2010.
- Water Demand Management Plan for the Tasman District – September 2011.

B.2.1.10 Strategic Approach

The key issues for the township of Richmond are.

- The Richmond source is used to capacity at peak times while the Waimea source is only used to about two thirds of its capacity at peak times.
- Overall the Council has sufficient water allocation for Richmond, however, with projected growth, the water rationing that occurs during droughts and the increasing competition for water in the district, it is becoming more difficult to source the water.
- Significant growth is predicted for Richmond, particularly in the south and the east, and it will be expensive for Council to install water supply infrastructure to service these new areas.
- Sea level rises and saline intrusion pose a threat to the security and quality of the Lower Queen Street and Waimea bores. Once these issues are detected, the ability to supply water to Richmond will be severely constrained.
- There is a lack of storage in the high-level zone.
- The Lee Valley Dam scheme is critical for the future of Council's urban water supplies in the Waimea Basin.
- The resource consent will expire in five years.
- Securing land for future reservoir sites will be difficult.
- Potentially there is a high cost for future infrastructure growth.

The strategic approaches to these issues are.

- Construct a new treatment plant to mix and treat water from both the Waimea source and Richmond source, (diluting the nitrates from one source and the corrosiveness from the other).
- Construct a supplementary source capable of providing sufficient output should the bores on Lower Queen Street or the Waimea bores be compromised due to saline intrusion. This development is dependent on the construction of the Lee Valley Dam.
- Amend the reticulation boundaries within Richmond to maximise the use of the reticulation capacity to meet future growth.
- Construct infrastructure to service the growth predicted firstly for Richmond East, then Richmond West and then Richmond South.
- Determine order of development, such as infill on existing zone land up to Bateup Road, Richmond West and Richmond South.
- Renegotiate water supply with Nelson City Council in areas such as Champion Road.

Table B-2: Register of Assets for Richmond Water Supply Scheme

Scheme	Source	Pumps And Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
URBAN									
Richmond	4 Bores - Lower Queen Street 1 Bore - Appleby (combined water permit = 7273m^3/day) Roding Dam Water permit = 909m^3/day	<u>Headworks</u> Appleby Well – Pleuger 20 hp PN63/16 Queen Street Well No 1– no pump, only flow meter Queen Street Well No 2 – Gould 8N-120-5 45 kW Queen Street Well No 3 – Gould 8N-120-5 45 kW Queen Street Well No 4 – EMU DCH 48-VII Queen Street Well No 5 – Pleuger PN83-4 30 kW <u>Queen Street Main Reservoir</u> Queen Street High Level No 1 – IEL VRD ¾ 55kW Queen Street High Level No 2 – Nimbus 125/100/250 45 kW <u>Pump Stations</u> Cropp Place PS: Pump 1 - Grundfos – CR4-80 1.5 kW, Pump 2 – details not shown in database Valhalla PS: Pump 1- Lowara SV3006F110 11kW, Pump 2 - Grundfos CR30-8/7 11 kW Hill Street South PS: 2x Lowara SV805 2.2 kW, 801 2.2 kW	No treatment is carried out.	Queen Street Main Reservoir 2250m³ Valhalla Lane Reservoir: Tank 1 : 450m³ Tank 2 : 700m³ Cropp Place Pump Station:9m³ Valhalla Drive Storage Tanks: 92m³ Faraday Rise Reservoir: 23m^3 Aniseed Hill Reservoir: 25m^3 Crop Place Lower Reservoir 4.6m^3 Aniseed High Level Reservoir: 25m^3	**Water Mains:**	10mm	40m	Fire Hydrants	611
						12mm	1,634m	Valves	1257
						15mm	7,297m	Metered Connections	5414
						20mm	4,398m		
						25mm	10,154m		
						32mm	639m		
						38mm	211m		
						40mm	5,877m		
						50mm	16,555m		
						75mm	1,518m		
						80mm	87m		
						100mm	30,595m		
						150mm	37,227m		
						200mm	1,044m		
						225mm	83m		
						250mm	491m		
						300mm	3,543m		
						375mm	5,848m		
						450mm	4,088m		
						Total	**131,332m**		

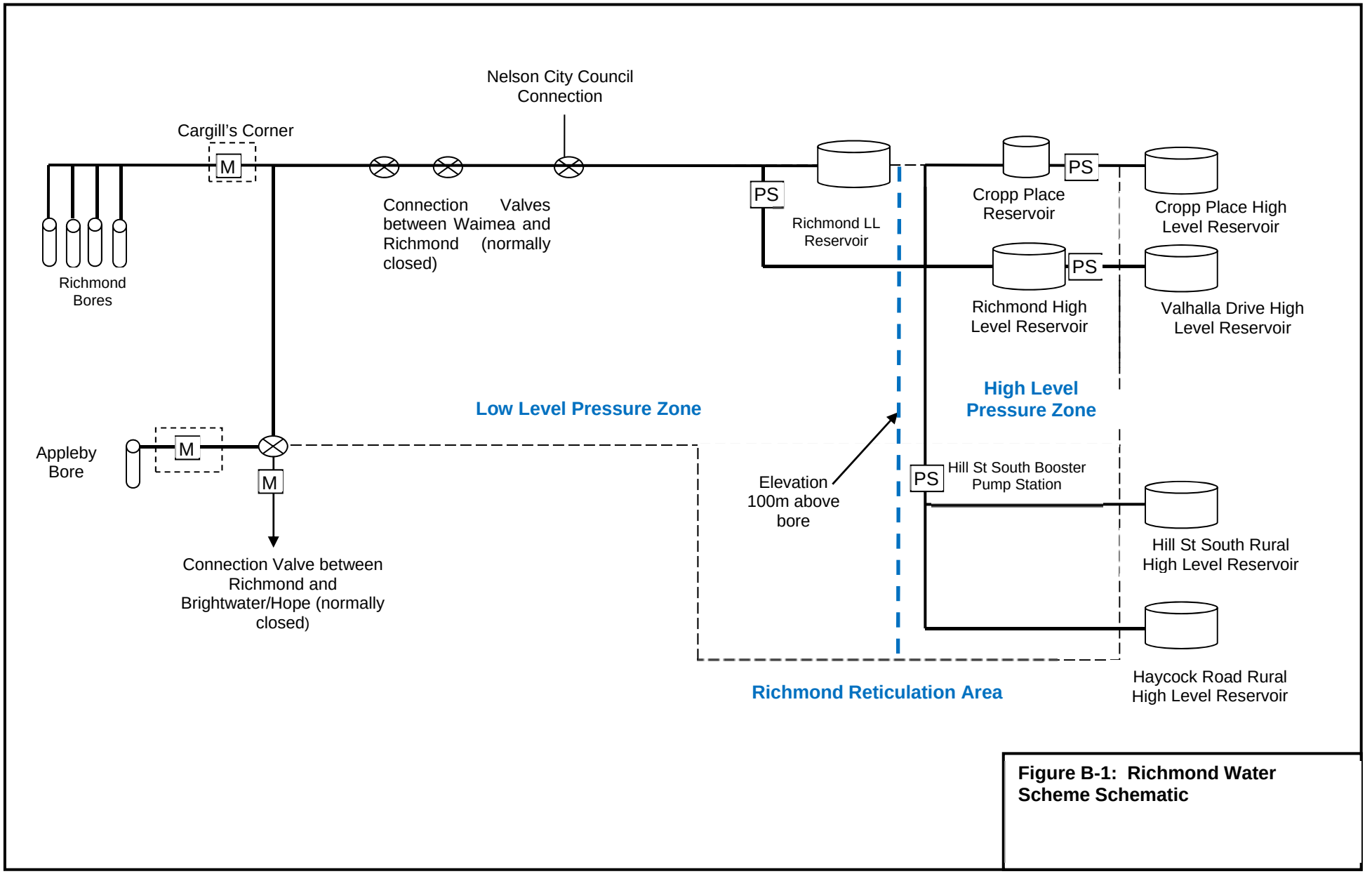


Figure B-1: Richmond Water Scheme Schematic

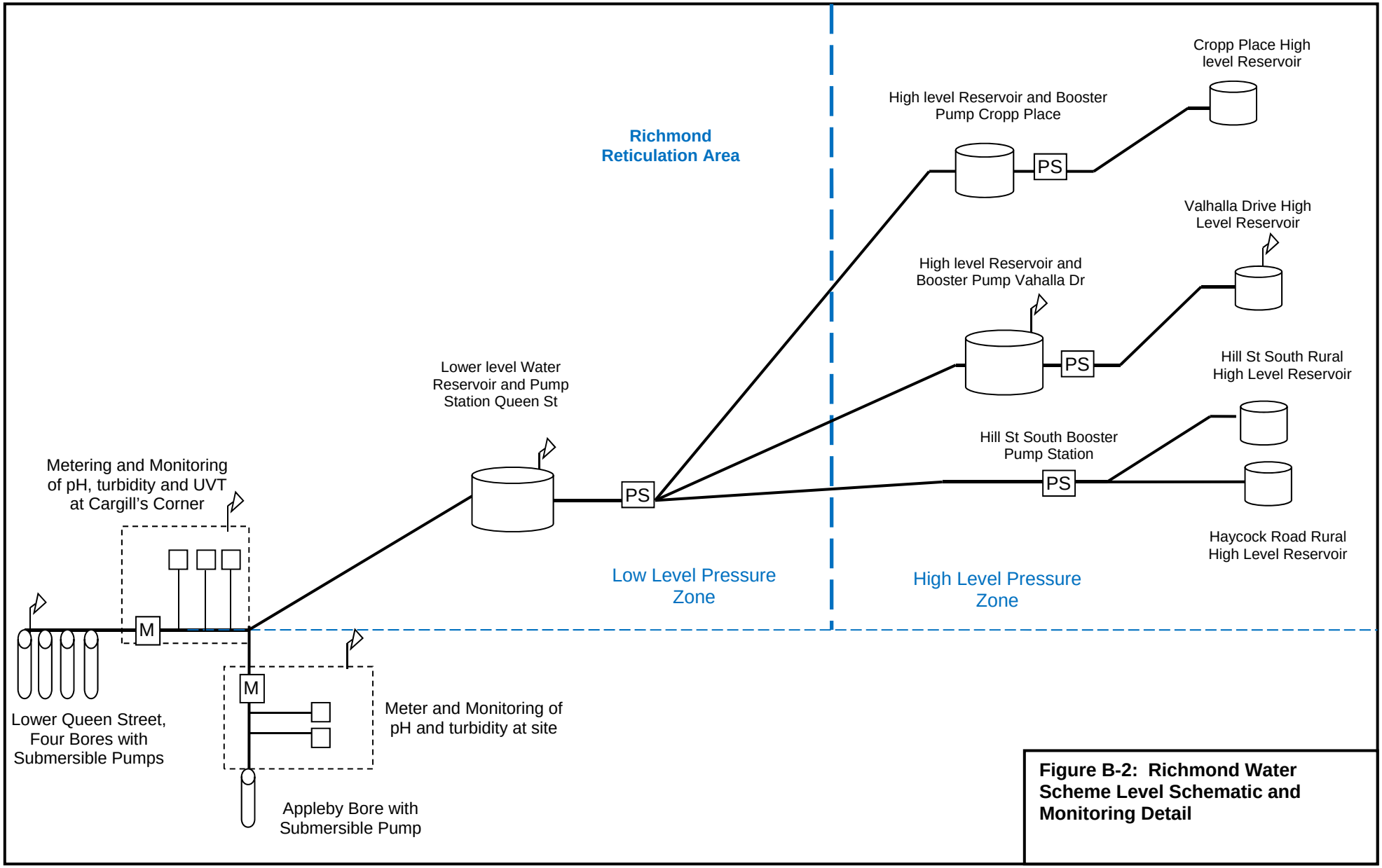


Figure B-2: Richmond Water Scheme Level Schematic and Monitoring Detail

B.2.2. Waimea Water Supply and Waimea Industrial Zone

B.2.2.1 System Overview

The Waimea scheme is the source of supply to several industries in the Stoke area of Nelson, a proportion of Richmond on the north side of Champion Road, an area south of Champion Road (previously fed by the Richmond supply), and the Mapua/Ruby Bay supply.

The Waimea water supply was constructed in 1976 to supply the freezing works and NZ Apple and Pear Board cannery in Nayland Road, Stoke, and later the Nelson Pine Industries plant in Lower Queen Street.

The Waimea water supply is obtained from groundwater from five operational bores and two emergency bores close to the Waimea River. The bores are all located on the true right hand side of the river with the five operational bores are on the river side of the stopbank. Water is abstracted from the Delta Zone of the Appleby Aquifer. These bores are considered unsecure as they are shallow (less than 10m deep).

Originally there were nine wells in the system, but four have been decommissioned as a result of saline intrusion into the groundwater of the Waimea River and delta zone. The two additional bores for emergency use were commissioned in 2006 but have never been used.

Predominantly the Waimea Water Scheme supplies water to two main zones:

- Waimea Industrial Zone (Queen Street, Main Road Stoke, Saxton Road and Nayland Road)
- Mapua/Ruby Bay urban and rural zone (see Section B2.3).

The Waimea scheme also supplies the Best Island and Rabbit Island rural connections.

The Waimea Industrial Zone serves a mix of urban and rural properties with major industrial use connections. There are 720 metered connections (June 2011) and 32 restricted rural connections (May 2011), giving a total estimated population of approximately 1,800.

B.2.2.2 System Operation Overview

Groundwater is treated at the Waimea Treatment Plant (WTP) by chlorination and lime addition. Four high lift pumps draw water from a contact tank and pump either to Mapua (two pumps) or to a trunk main system extending around the coastal area of Richmond via Champion Road to a 5,700m^3 concrete reservoir in the Richmond foothills. The Champion Road reservoir provides the static head to the supply and when the treatment pumps are off, water will flow back down the main to supply the industrial users as well as Best Island.

The Mapua pumps supply water directly into the Mapua trunk main which crosses Bell Island, Best Island and Rabbit Island, the Mapua channel (to Mapua Wharf) and then passes on to the Pomona Road reservoirs. The trunk main supplies water directly to houses (see section B.2.3).

As discussed in Section B2.1 Richmond Water Supply, there is a link between the Richmond and the Waimea systems separated by closed valves within the reticulation and a booster pump at the Richmond Queen Street well site which can be used in an emergency. As the Waimea Water Supply trunk main is located on the northern perimeter of the Richmond urban area, this has been used to supply the increasing residential demand in Richmond North. Although technically metered in Richmond, these metered connections have been included in the total number of metered connections on the Waimea scheme as they are using Waimea water.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.2.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment at critical are:

- Richmond Network – at extreme risk to earthquake during and immediately after the event
- Waimea Wells – at risk to flooding and/or inundation
- Waimea WTP – at risk to flooding and/or inundation.

B.2.2.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Waimea.

LoS 7– P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Waimea in the last five years.

LoS 8– PHRMPs are in place, approved and being implemented for each water supply.

- Waimea Water Supply has an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Waimea complies with the exception of some hydrants in Hill Street North and Champion Road near the reservoir.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Waimea has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Waimea has sufficient storage.

B.2.2.5 Asset Condition Overview

The scheme assets include:

- five bores and pumps (normal operation)
- two emergency bores and pumps
- four high lift pumps
- treatment plant with gas chlorination and lime addition
- Champion Road main reservoir and pump station
- Champion Road high level reservoir and booster pump station.

The scheme assets are generally in good condition. The condition of most of the reticulation is good, however the pH of the water is low and considered ‘aggressive’. This results in copper laterals leaking and needing replacement. This could be improved by upgrading the lime dosing system at the treatment plant.

To improve security of the supply the well heads need to be protected from stock access. This is planned to be completed in 2011/12.

An electrical upgrade and a digital telemetry upgrade were completed in 2010. Due to a power spike at the treatment plant in 2010 (which severely damaged electrical equipment) all of the water quality monitoring equipment and some of the pump variable speed drives (VSDs) were replaced in the second half of 2010.

The construction of a new treatment plant for the blending and treatment of water from both the Waimea and Richmond sources has been identified as a strategic approach to managing issues with these water sources. Specifically, the mixing of water sources will dilute the high nitrate levels in the Richmond source and reduce the corrosiveness of the Waimea source.

B.2.2.6 Water Quality and DWSNZ Compliance

Required sampling – The Waimea scheme supplies approximately 4,100 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ. The Waimea Industrial Zone has a registered population of 1,800 people and the Mapua/Ruby Bay zone has an estimated population of 2,300 (currently registered at 1,500). Until August 2011 the Waimea Industrial Zone was registered as only 180 people.

The DWSNZ requires water leaving the treatment plant and the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter, with a maximum of 13 days between samples and five different days of the week used at the plant
- 13 samples per quarter with a maximum of 11 days between samples and five different days of the week used in the zone.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

The treatment plant has online turbidity, pH, UVT and chlorine analysers. The chlorinator is an automatic dose unit, meaning that it automatically alters the dose depending on the residual dose leaving the plant.

Historical results - Between July 2006 and June 2011, 64 samples were taken from the Waimea Industrial Zone and 182 samples from the plant with no non-compliances.

B.2.2.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Waimea	GW	Five bores and two emergency bores close to Waimea River.	RM110192	15/07/2011	31/05/2017

B.2.2.8 Current and Future Demands

The current demand is easily met by the Waimea supply, but water restrictions have been imposed to some degree most summers.

The Waimea Basin is short of water, this is due to over allocated water takes, insufficient water for environmental needs and water rationing.

The daily water use is shown in the Table B-3 below.

Table B-3: Current Demand of Waimea Waste Supply

Source	Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Average Annual Demand (m^3/d)	Maximum Daily Demand (m^3/d)
Waimea	15,400	3,496	2,922	3,076	4,025

The future water supply to Mapua is expected to be supplied by the coastal pipeline project which will source water from Motueka.

The zonal boundary between the Waimea and Richmond supplies is being altered to better utilise the storage capacity of Champion Road reservoir.

The future supply of the Waimea zone will become a blended mix of Richmond and Waimea sources. The zone will not be solely reliant on the Waimea supply. Therefore the Richmond supply and Waimea supply will no longer exist as separate water supplies. Refer to section B2.1.8 for future details.

B.2.2.9 Strategic Studies

Various strategic studies have been undertaken to date for the Waimea water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond Water Supply Network Model – 2011.
- Richmond and Brightwater/Hope Water Demand Management Plan – August 2010.
- Mapua/Ruby Bay and Waimea Industrial Zone Public Health Risk Management Plan – February 2011.
- Water Demand Management Plan for the Tasman district – September 2011.

B.2.2.10 Strategic Approach

For the strategic approach for the Waimea zone refer to section B.2.1.10.

Table B-4: Register of Assets for Waimea Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
URBAN									
Waimea	5 Bores – Waimea River Delta Zone 2 Emergency Bores – Waimea River Delta Zone Water Permit = 15,400 m^3/day (includes Mapua)	<u>Headworks</u> Well No 9 - Goulds 9N/130 22kW Well No 8 - Goulds 9N/130 22kW Well No 7 - Goulds 9N/130 18.5kW Well No 6 - Goulds 8N/180 11kW Well No 5 - Goulds 8N/180 11kW Well No 10 - Goulds 10JNC-2 30kW Well No 11 - Goulds 10JNC-2 30kW <u>Waimea Treatment Plant and PS</u> High Lift Pumps 1, 2 and 3 -Ritz Norma 100 h.p High Lift Pump 4 - Thompson Kelly Lewis 132kW <u>Champion Road Main Res and PS</u> Pump 1 - Lowara SV809 4kW Pump 2 – *(details not shown in database*)	Lime dosing for pH correction Gas chlorination with Residual control Turbidity Measurement Chlorine Measurement and Monitoring pH Measurement	Champion Road High Level Reservoir 23m^3 Champion Road Main Reservoir 5,700m^3	**Water Mains:**	20mm 25mm 50mm 80mm 100mm 150mm 200mm 250mm 300mm 375mm 450mm **Total**	14m 8m 465m 5m 439m 767m 1,104m 10m 634m 839m 510m **4,798m**	Fire Hydrants 34 Water Meters 96 Restrictors 34 Valves 18	

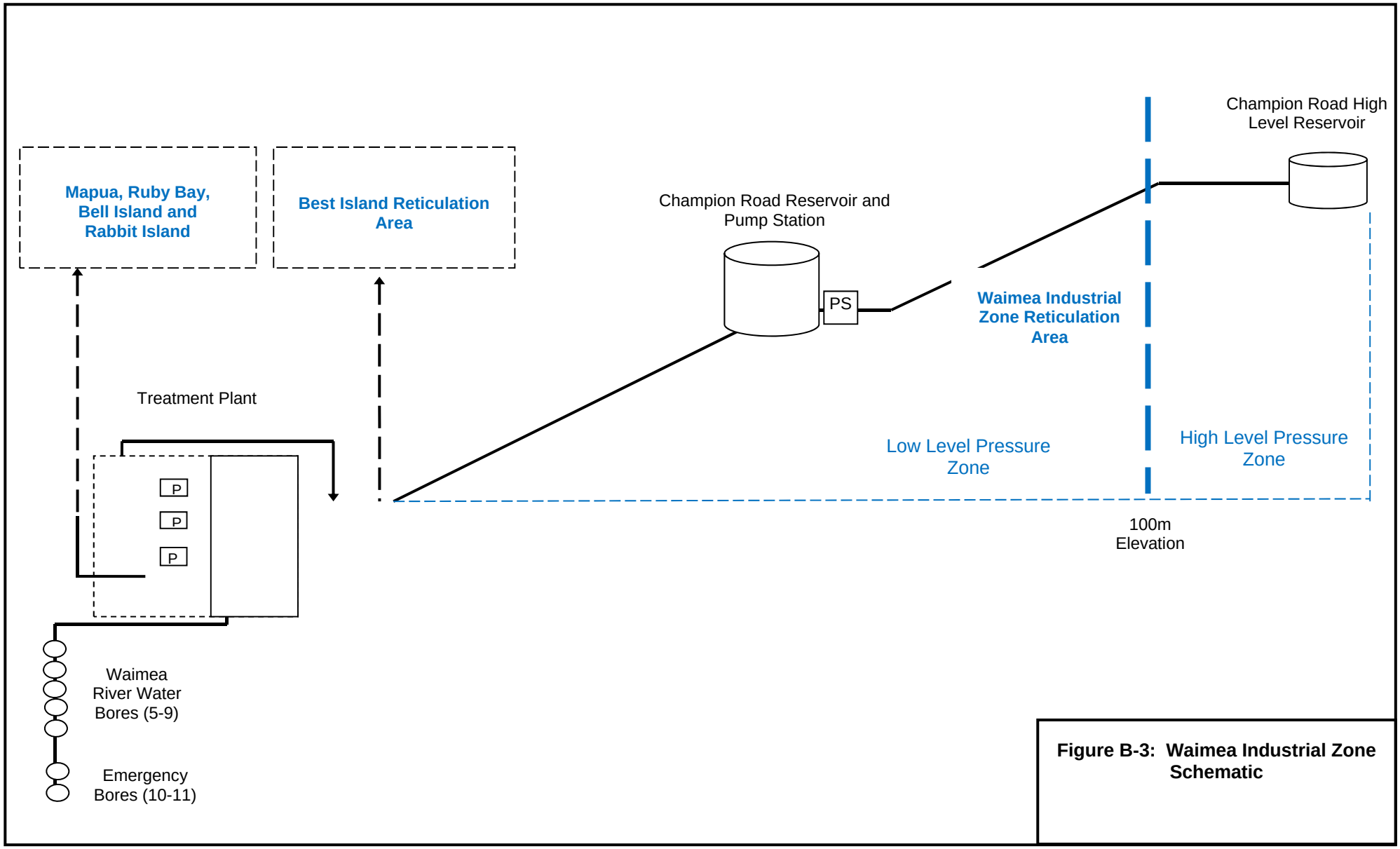


Figure B-3: Waimea Industrial Zone Schematic

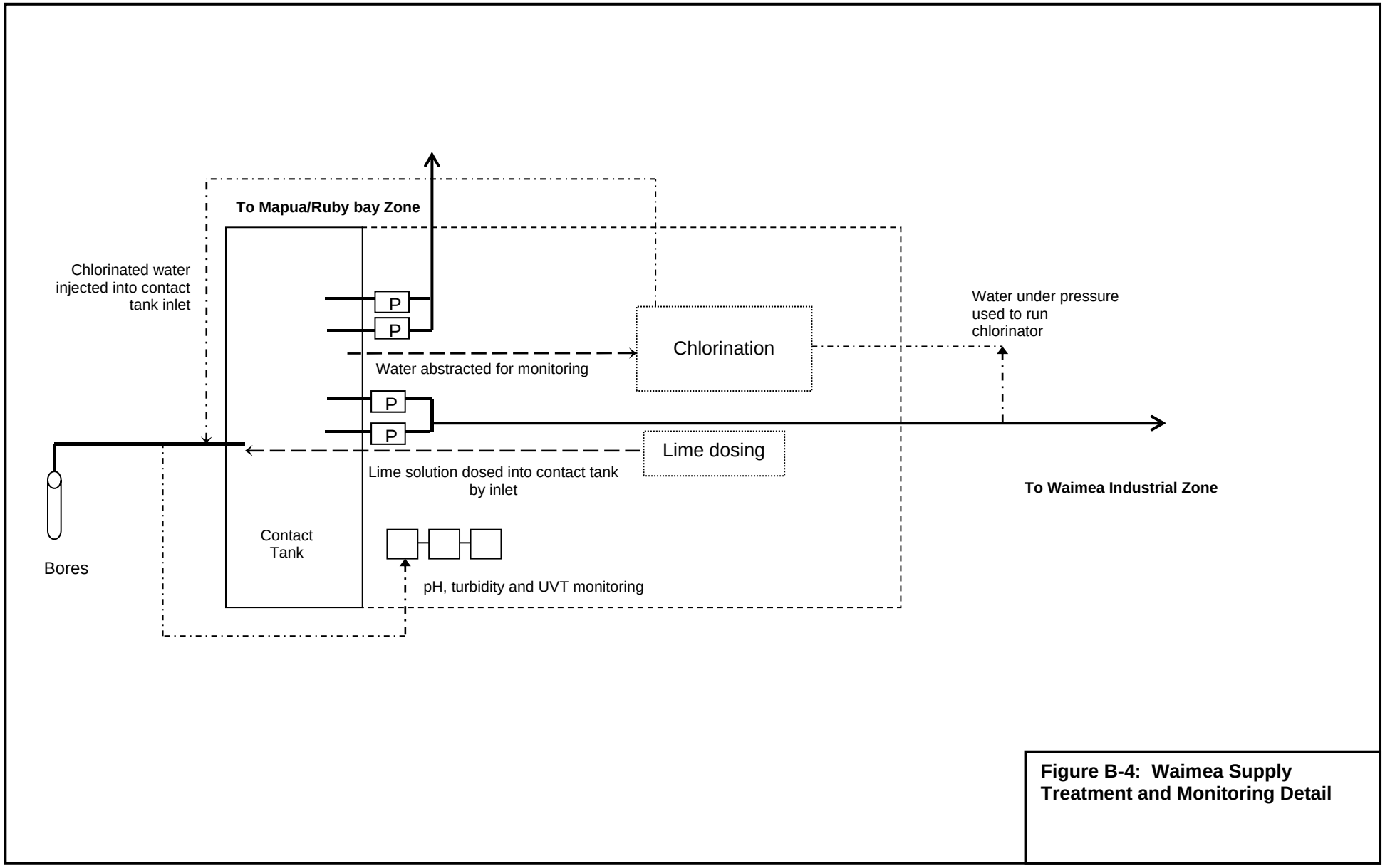


Figure B-4: Waimea Supply Treatment and Monitoring Detail

B.2.3. Mapua/Ruby Bay Zone (Waimea Water Supply)

B.2.3.1 System Description

The Mapua/Ruby Bay zone is part of the Waimea Water Supply (see section B.2.2) for further system description details). Two dedicated high lift pumps at the treatment plant in Lower Queen Street extract water from the contact tank and pump it to the Pomona Road reservoirs in Ruby Bay.

The Mapua/Ruby Bay zone serves a mix of urban and rural properties with some commercial use connections. There are 720 metered connections (June 2011) and 230 restricted rural connections (May 2011), a total estimated population of approximately 2,300. This population needs to be updated in the WINZ register, which currently has a registered population of 1,500 however it will not alter the sampling required.

The Mapua/Ruby Bay zone covers the golf course on Best Island, Bell Island wastewater treatment plant, public facilities at Rabbit Island, and the urban area of Mapua and Ruby Bay. In Mapua there is a rural extension to areas of Old Coach Road, Marriages Road, Seaton Valley Road, Ruby Bay Bluff and Permins Road areas.

The system has three main supply zones, namely.

- The lower areas between the Pomona Road reservoir and the Waimea pump station. This zone has a mixture of metered connections and rural restrictors.
- The high level serviced by the Pine Hill Heights booster pumps.
- The high level and rural extensions supplied from the Pomona Road booster pump and the Old Coach Road reservoir.

B.2.3.2 System Operation Overview

In 1990, when the Mapua/Ruby Bay water supply was added to the Waimea scheme it was done so via a connection off the Waimea Industrial Zone main at the Lower Queen Street pump house. This zone is now supplied using two dedicated pumps. In 2005 a new booster pump station was installed at Mapua Wharf to increase trunk main flow and enable the reservoirs at Pomona Road to fill more quickly.

Pine Hill Heights is supplied via a booster pump off the Mapua trunk main that pumps to a 90m³ reservoir at the top of the subdivision. At the reservoir site a pair of booster pumps operate on a VSD to maintain supply pressure.

The Marriages Road rural extension is supplied via a booster pump off the Pomona Road reservoir that pumps to a reservoir in Old Coach Road. This pump station will operate automatically to maintain reservoir storage. This reservoir is expected to provide one day's average supply for present and future demand to the year 2025 and beyond, when little growth is expected.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.3.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms sections of networks identified from the Vulnerability Assessment as critical are:

- Waimea wells – at risk to flooding and/or inundation
- Waimea WTP – at risk to flooding and/or inundation.

B.2.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Mapua/Ruby Bay.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Mapua/Ruby Bay in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Waimea has an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Mapua/Ruby Bay meets the fire fighting standard except for areas around Brabant Drive.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Mapua/Ruby Bay has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Mapua/Ruby Bay has sufficient storage.

B.2.3.5 Asset Condition Overview

The reticulation is in average condition. There are areas of poor quality, fragile pipeline in Mapua. A section of trunk main from the treatment plant to the Pomona Road corner has burst a number of times since its construction. The first kilometre section of this main has been replaced.

Daily consumption has remained at an acceptable level since the leak detection survey and repairs in November 2009.

There have been four breakages of the 200mm trunk main, two on Stafford Drive, one on Aranui Road outside the supermarket, and one at Best Island. The pipeline between Best Island and Rabbit Island was replaced in 2006.

To resolve the issue of gravel in the reticulation, a scour was installed in the trunk main at the west end of Rabbit Island in July 2000. Regular flushing has removed a considerable quantity of gravel with the quantity reducing to just a handful each month.

See Section B.2.2 for further detail of the Waimea treatment plant.

B.2.3.6 Water Quality and DWSNZ Compliance

Required sampling - Mapua/Ruby Bay supplies approximately 2,300 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require as a minimum, the following sampling to be carried out in the zone:

- 13 samples per quarter
- a maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

Chlorine, turbidity and pH measurements are also taken when bacteriological samples are taken.

Lead is a P2 determinand in the zone and is monitored in the reticulation three times per quarter.

Historical results - Between July 2006 and June 2011, 265 *E.coli* samples were taken from the zone. None of these samples have shown a transgression. The lead sampling results are usually at or below the limit of detection. This P2 can probably be removed from this zone if the appropriate testing is undertaken.

B.2.3.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater (this is the same resource consent for Waimea industrial and Waimea plant water supply).

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Waimea	GW	Five bores and two emergency bores close to Waimea River.	RM110192	31/05/2011	31/5/2017

There is a resource consent in place for the disturbance and occupation of the coastal marine area to install a duplicate pipeline across two channels within the Waimea Inlet.

Scheme	Consent type	Consent No.	Date Granted	Date Expiry
Waimea	Coastal permit	RM060492	27/06/2006	27/06/2041

B.2.3.8 Current and Future Demands

One of the key limitations for the Mapua/Ruby Bay system is the source and water availability. Currently no new connections are allowed to the Mapua system due to lack of capacity.

The daily water use is shown in Table B-5 below.

Table B-5: Current Demand of Mapua/Ruby Bay Supply

Scheme capacity (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
3,000	1,353	823	1,036	1,815

Until the development of the Coastal Tasman Area (CTA) and coastal pipeline, Mapua and surrounding areas will be unable to expand.

With the construction of CTA and the coastal pipeline, it is anticipated that in 2033 the demand in Mapua and the surrounding area is as follows:

- average day demand – 4,611 m^3/day
- peak day demand – 6,249 m^3/day.

B.2.3.9 Strategic Studies

Various strategic studies have been undertaken to date for the Mapua/Ruby Bay water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond, Wakefield, Waimea and Mapua Water Supply Network Model – January 2007.
- Water Demand Management Plan for the Tasman district – September 2011.
- Mapua/Ruby Bay and Waimea Industrial Zone Public Health Risk Management Plan – February 2011.
- Motueka Costal Community Water Supply Demand Projection – August 2011.
- Coastal Pipeline and Tasman View Road Upgrade – April 2011.
- Coastal Pipeline – Reservoir Siting Investigation – July 2010.
- Coastal Pipeline – Preliminary Hydraulic Design Report – November 2010.

B.2.3.10 Strategic Approach

The key issues with Mapua/Ruby Bay are.

- The Mapua/Ruby Bay scheme is presently supplied from Waimea. Supplying additional water to Mapua is not possible due to the present system being at full capacity. In light of this, no new connections to the water supply system are allowed.
- The future development of Mapua / Ruby Bay water supply is inherently tied to the 'Coastal Pipeline' project and the development that proceeds due to the re-zoning of the Coastal Tasman Area. Therefore a key issue is managing the existing system until the 'Coastal Pipeline' is completed.

The strategic approach for the Mapua / Ruby Bay scheme (in conjunction with Motueka and the CTA) is therefore to.

- Construct the 'Coastal Pipeline' from Motueka to Mapua, including construction of the water source near Motueka.
- Connect Mapua Rural Extension into the 'Coastal Pipeline'.
- When financially affordable, extend the reticulation systems from the 'Coastal Pipeline' to serve new areas along its length (parts of Redwood Valley and Dovedale).
- Rural properties supplied from the 'Coastal Pipeline' will be limited to 1.5m^3/day.
- The existing system will be maintained to a minimum level needed to provide service until the coastal pipeline is complete.

Table B-6: Register of Assets for Mapua/Ruby Bay Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage		Reticulation			Other Assets	
Mapua / Ruby Bay	See Waimea Source	<u>Brabant Drive Booster PS</u> Grundfos CR 30/30 4kW <u>Mapua Booster PS</u> Southern Cross Starline 100 x 65-250 37kW <u>Pinehill Reservoir and PS</u> Grundfos CR 16/30 3kW with Hydrovar VS Lower PS - Grundfos CR 30/30 4kW <u>Pomona Road Reservoir and PS</u> 2 x Lowara SV 30-08 15kW	See Waimea treatment plant information.	Pomona Road Main Reservoir Temporary Pine Hill Heights Old Coach Road	700m³ 1,000m³ 90m³ 70m³	**Water Mains:**	15mm 20mm 25mm 32mm 40mm 50mm 80mm 100mm 150mm 200mm 250mm 300mm 375mm 450mm **Total**	3,728m 2,142m 12,545m 922m 2,138m 20,381m 900m 5,845m 6,577m 12,938m 4,213m 88m 290m 23m **72,730m**	Fire Hydrants Valves Metered Connections	103 243 756

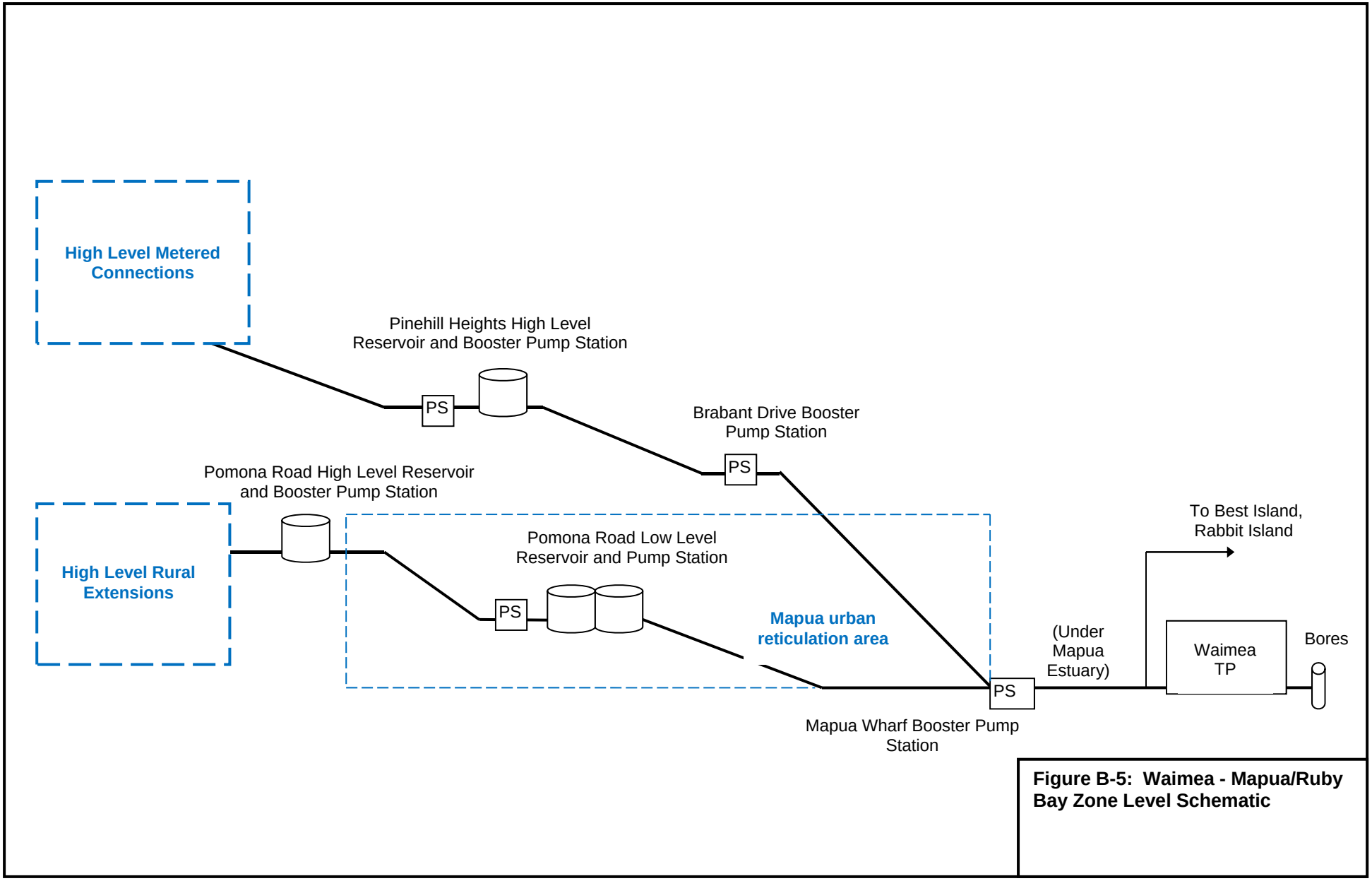


Figure B-5: Waimea - Mapua/Ruby Bay Zone Level Schematic

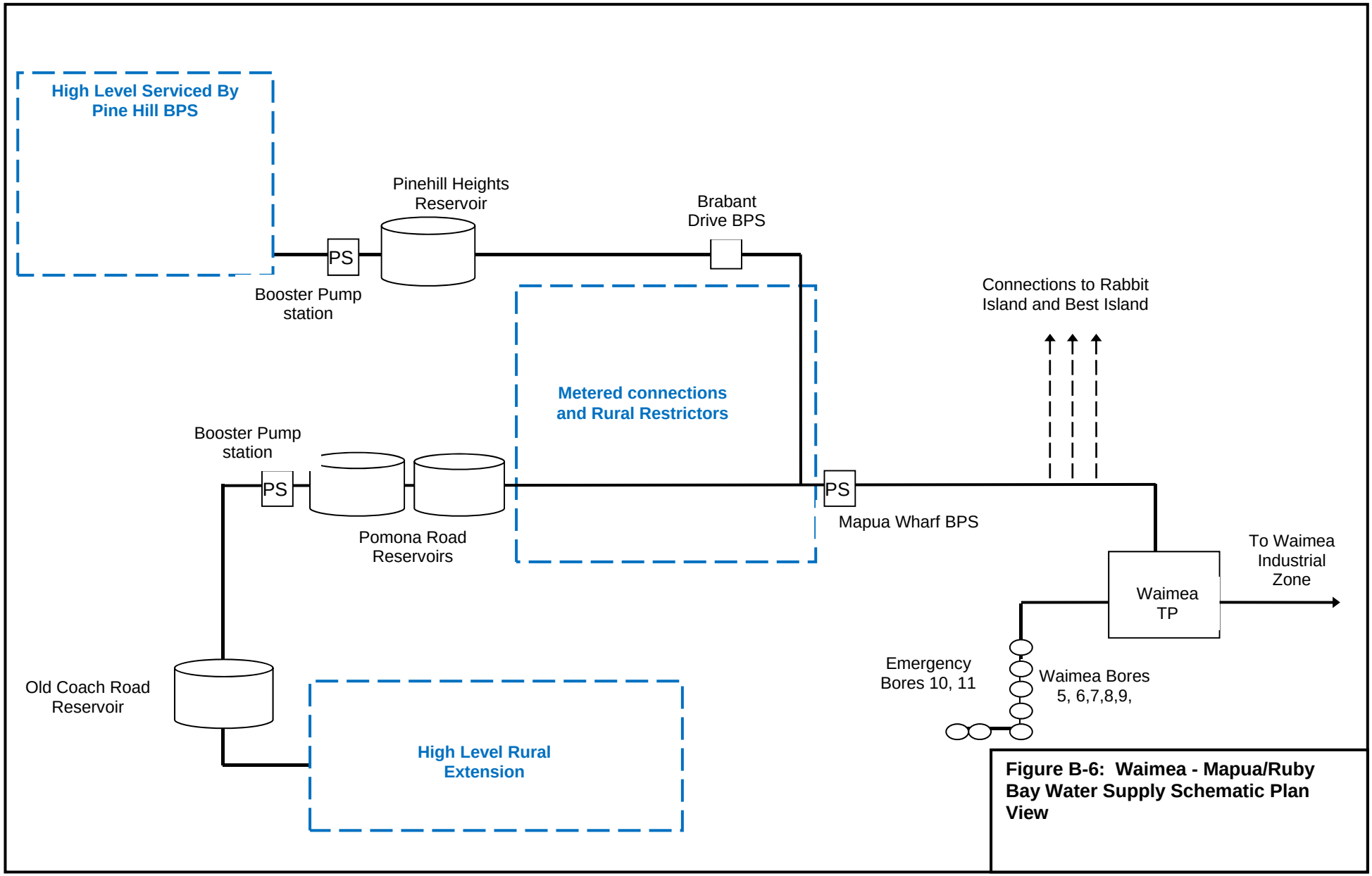


Figure B-6: Waimea - Mapua/Ruby Bay Water Supply Schematic Plan View

B.2.4. Wakefield Water Supply

B.2.4.1 System Description

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

- Wakefield South
- Spring Grove
- Pigeon Valley.

Source water for the Wakefield scheme is extracted from a well with infiltration gallery (and back up bore) close to the Wai-iti River behind the Wakefield fire station. When first established, two pumps were installed in an original well. Due to high summer demand however, and the slow recharge rate of the well, one of the pumps was relocated to a small diameter bore closer to the Wai-iti River. Subsequently an infiltration gallery, connected to the original well, was installed to intercept ground water adjacent to the Wai-iti River. This is now used as the main source of water for the Wakefield supply. The bore closer to the river is still available as an emergency standby.

The land on which the bores are located is owned by Tasman District Council. The general area is open to public access, with a public reserve and a turning area predominantly used by truck and trailer units adjacent to the site. An area approximately 5m by 5m around the well head and electrical cabinet is fenced off from the public and the lid of the well entry point is locked with a Tasman District Council Abloy padlock.

The infiltration gallery is at a depth of approximately 4m. The emergency bore is approximately 5m deep. The gallery and wells are not considered to be secure under the DWSNZ due to their shallow depth and the influence of the Wai-iti River. The consented take for the gallery and associated wells is 100m^3/hour, 1,300m^3/day and 9,100m^3/week.

The scheme is linked to the Brightwater scheme via a pipe which runs along the old Railway Reserve with a booster pump station at Bird Road. This connection can be used for emergency supply to either township, particularly during summer high demand months when the groundwater levels are low and the Wakefield pumps have difficulty supplying the demand. The link pump from Brightwater to Wakefield is usually turned off, but can be activated manually. It can operate automatically once activated via a low level control on the Wakefield reservoir.

The Wakefield Water Supply scheme supplies a population of approximately 1,855. All 711 urban connections are metered (June 2011) and the 62 connections from rural extensions (May 2011) are restricted by a low-flow valve.

B.2.4.2 System Operation Overview

The scheme comprises:

- a bore with submersible pump
- a treatment plant with aeration tower and chlorination
- a contact tank
- two high lift pumps
- Brightwater Water Supply link pump station
- a booster pump station at Treeton Place
- two storage reservoirs.

Submersible pumps in the well (and bore) pump water to a treatment plant located on Pigeon Valley Road. At the treatment plant, the water is aerated using a tower to release some of the free carbon dioxide and increase the pH, making the water less corrosive. This is connected directly to a contact tank where the water is then disinfected inline by chlorine gas.

The concentration of chlorine in the water leaving the treatment plant is monitored continuously at the point it leaves the contact tank. Online monitoring of pH and turbidity via telemetry also occurs on the raw water but does not currently control any plant operation.

From the contact tank, two high lift pumps draw water and deliver it directly to the two system reservoirs ($450m^3$ and $750m^3$, located in the Edward Street Reserve above the church in Edward Street) and also directly into the reticulation system. The land on which the reservoirs are sited is owned by Tasman District Council.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.4.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment as critical are:

- Wakefield Network – at extreme risk to earthquake during and immediately after the event.

B.2.4.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Wakefield.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Wakefield in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Wakefield PHRMP is due/will be /has been submitted for approval in November 2011 (Update).

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Wakefield complies, except for Clifford Road, Martin Avenue and the Whitby Road areas.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Wakefield Bay has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Wakefield has sufficient storage.

B.2.4.5 Asset Condition Overview

The scheme assets are in moderate condition. The well pumps, treatment plant, reservoirs and pump stations are connected to telemetry. The pumps operating on the demand of the high/low level sensors in the reservoir. A digital telemetry system is needed to better manage the water supply and quality to customers and ensure full compliance with DWSNZ.

Pressure/flow problems are experienced in the elevated areas of Hunt Terrace and Pigeon Valley due to lack of available head. The development of booster pumps and additional reservoir storage could eliminate this problem and need to be considered in the subsequent upgrade to the scheme.

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

Leak detection was carried out in 2011, with 137 m^3/ day of leakage identified. Six large leaks accounted for 84% of this leakage. These leaks were subsequently fixed.

Due to the proposed construction of a new treatment plant at Spring Grove, for which budget is allocated in years 2016/17, no recent improvements have been made to the well head and none are proposed. If the Wakefield supply is inundated by flood waters, resulting in contamination of the water supply beyond the current treatment capabilities, or the electrical controls fail, the community can be served from the Brightwater/Hope Scheme through the link and pump station at Bird Road.

B.2.4.6 Water Quality and DWSNZ Compliance

Required sampling - Wakefield supplies approximately 1,855, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter
- maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

Historical results - Between July 2006 and June 2011, 268 samples were taken from the zone. Two of these were transgressions. These occurred during the 2007/2008 summer period. Two hundred and thirty eight samples were taken from the plant, with no transgressions.

B.2.4.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Wakefield	GW	Two bores/wells near Wai-iti River	NN0010212	01/01/2001	31/05/2016

B.2.4.8 Current and Future Demands

The current demand is generally met by the Wakefield supply, although during prolonged drought, the source struggles to meet peak day demand. Construction of a 750m^3 reservoir in 2010 should have at least partly resolved the peak demand. The daily water is shown in Table B-7 below.

Table B-7: Current Demand of Wakefield Supply

Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
1,300	842[1]	632[2]	887[3]	1,059

[1] Calculated from the works weekly readings from beginning of October 2009 to the end of February 2010.
[2] Calculated from the works weekly readings from beginning of April 2011 to the beginning of August 2011.
[3] Calculated from the works weekly readings from beginning of October 2009 to the end of February 2010 and from mid-August 2010 to mid-December 2010.

It is anticipated that in 2029 the demand in Wakefield is as follows:

- average day demand – 923m^3/day.
- peak day demand – 1,845m^3/day.

To manage the growing demand in Wakefield, Council are taking the following key measures:

- sourcing water from a new source and constructing a new treatment plant
- developing a water supply plan for rural and residential growth
- improving the connectivity between Brightwater and Wakefield.

B.2.4.9 Strategic Studies

Various strategic studies have been undertaken to date for the Wakefield water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Wakefield Water Supply Network Model – January 2007.
- Public Health Risk Management Plan for the Wakefield Water Supply – due by June 2012.
- Water Demand Management Plan for the Tasman district – September 2011.

B.2.4.10 Strategic Approach

The key issues for the Wakefield urban water supply are.

- The existing source does not supply adequate volume of water to serve the future demand.
- Water quality does not meet DWSNZ.
- The reticulation has a high leakage rate.
- The existing AC trunkmain from Brightwater to Wakefield has a low pressure class rating.
- Rural residential growth to the southwest of Wakefield needs to be supplied with water. This area overlaps Wakefield and 88 Valley schemes. Servicing it from either scheme has issues and as yet there is no clear plan of how this will be addressed.

The strategic approaches are to.

- Develop a water supply plan for rural and residential growth. This work will tie in with resolving issues for 88 Valley supply. This will confirm whether the source of the water supply is either Wakefield or 88 Valley.
- Construction of a new bore to meet future demands for Wakefield, with treatment plant facilities to meet DWSNZ.
- Upgrades associated with the new Wakefield supply will upsize undersized pipelines and replace much of the reticulation and existing AC trunk main from Brightwater.
- To construct facilities to improve the inter-connectivity of the schemes so that during drought times, water can be moved to where it is needed most.

Table B-8: Register of Assets for Wakefield Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Wakefield	Bore and Infiltration Gallery – Wai-iti River Water Permit = 1,300m^3/day	<u>Wakefield Wells</u> Well 1 – Grundfos SP125-1-A 7.5kW Well 2 –. Grundfos SP95-2 9.2 kW Well 3 – Ritz New Haden 5.5hp <u>Wakefield Treatment Plant and PS</u> 2x Ajax ZLC 20HP (60m3/hr) <u>Brightwater Link PS</u> Grundfos CR 60/60 (15kw) <u>Treeton Place (Wai-iti Hills)</u> Grundfos CR4 120 2.2 kW	Aeration for pH adjustment Gas chlorination Chlorine Measurement pH Measured Turbidity Measured	Wakefield Reservoir 450m^3 New Wakefield Reservoir750m^3 Treeton Place Upper Reservoir 23 m^3 Treeton Place Lower Reservoir 23 m^3	**Water Mains**	12mm 15mm 20mm 25mm 40mm 50mm 65mm 100mm 150mm **Total**	26m 1,633m 1,055m 5,253m 3,564m 4,547m 1,980m 3,560m 11,177m **32,795m**	Fire Hydrants 83 Valves 189 Water Meters 756	

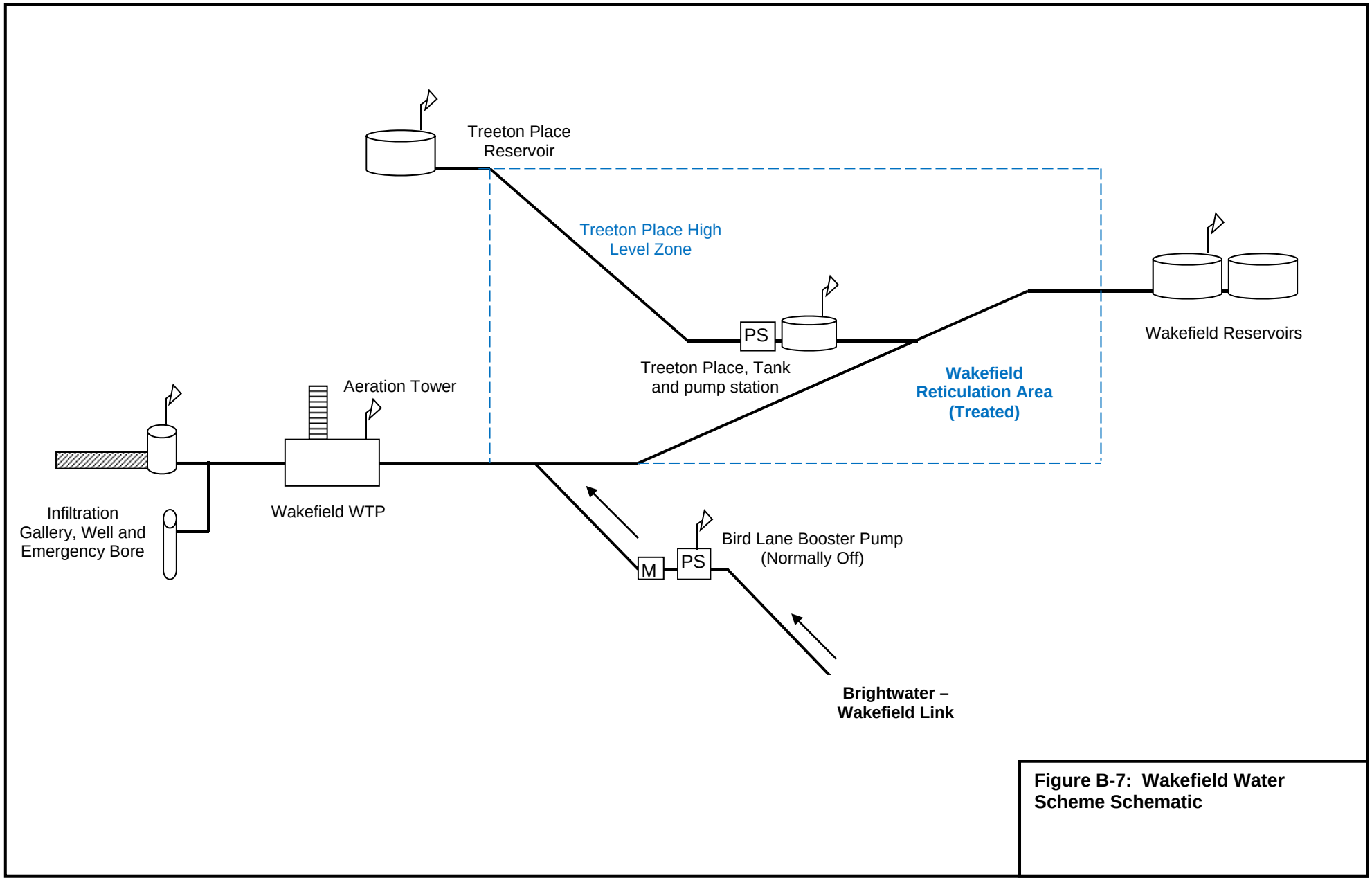


Figure B-7: Wakefield Water Scheme Schematic

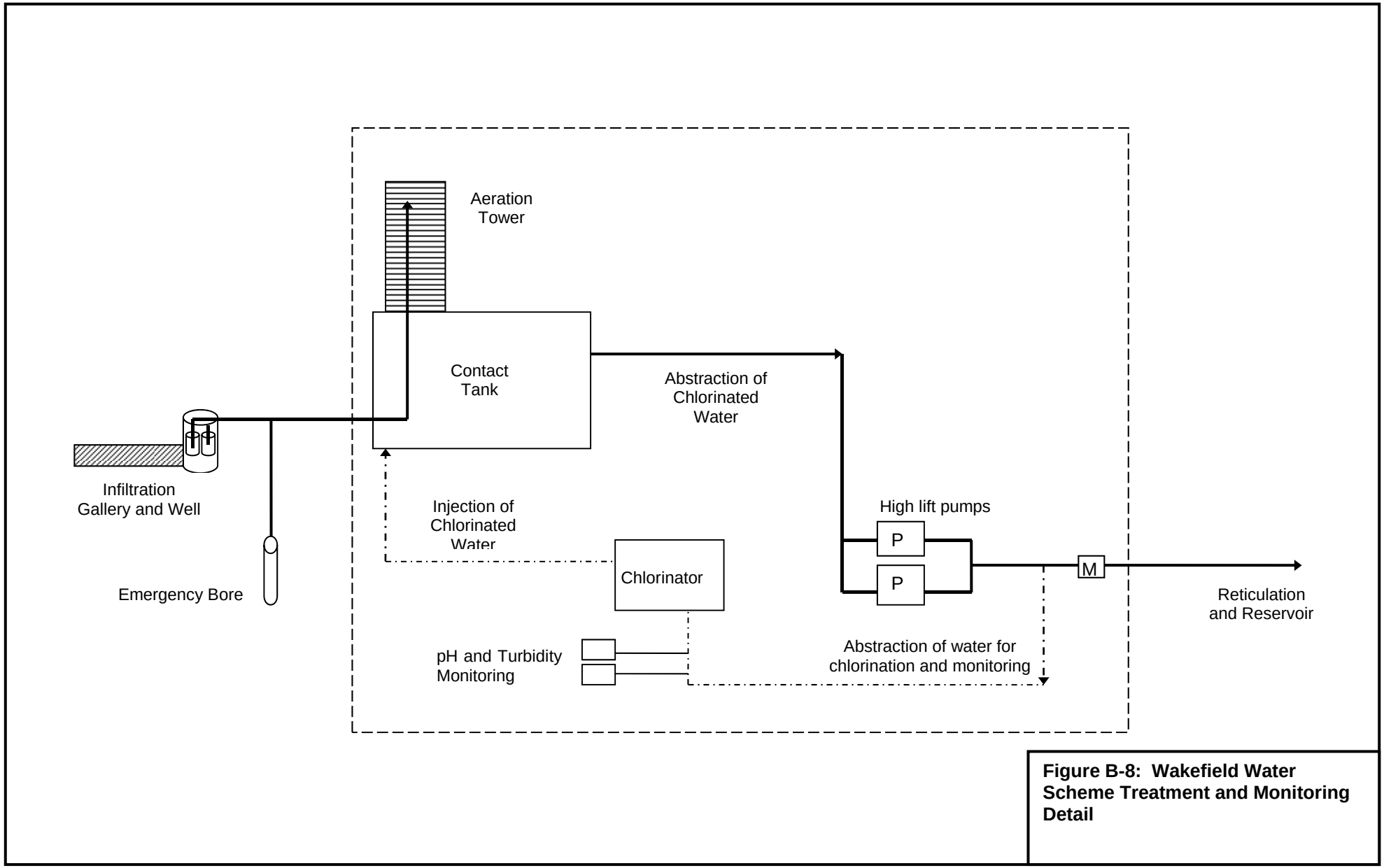


Figure B-8: Wakefield Water Scheme Treatment and Monitoring Detail

B.2.5. Brightwater Water Supply

B.2.5.1 System Description

The Brightwater supply was constructed in 1976 and serves the Brightwater urban area and the following rural extensions:

- Mt Heslington Road to the lower end of the 88 Valley Rural scheme at River Terrace Road
- Teapot Valley
- Jeffries Road
- Hope (Paton's Road and Pugh's Road) (largest extension).

The scheme takes water from three bores located in a vineyard close to the Wairoa River, just south of the Wairoa River Bridge (SH 6). The bore headworks were upgraded in 2010 to raise them above the 50-year flood plain.

In drought conditions water may be more difficult to source from the bores, however water can also be sourced from the Richmond Water Supply to offset restrictions within the reservoir zone.

The supply serves a mix of urban and rural lifestyle/agricultural properties with few commercial properties. There are 880 metered connections (June 2011) and 253 restricted rural connections (May 2011), a total estimated population of approximately 2,700.

B.2.5.2 System Operation Overview

Submersible pumps in the bores pump water to a treatment plant on the other side of the state highway (to the north-west). At the treatment plant, the water is disinfected inline by chlorine gas injection. Chlorinated water then flows into a contact tank with a residence time of at least 30 minutes. One of three high lift pumps extract water from the contact tank and pump water via a falling/rising main to the two main reservoirs and also directly into the reticulation.

The concentration of chlorine in the water leaving the treatment plant is monitored continuously at the point that it leaves the contact tank, with this data used to vary the dose. Online monitoring of pH, turbidity and UVT occurs on the raw water but does not currently control any plant operation.

The bores, treatment plant and two main reservoirs are connected to the telemetry system and most equipment at these sites can be remotely monitored and/or operated.

Normally there is a closed connection to the Wakefield scheme at Bird Road for emergency supply from Brightwater to Wakefield. There is also a closed connection from Richmond at Three Brothers Corner for emergency supply from Richmond to Brightwater.

At Teapot Valley, there are several properties at a higher elevation than the main scheme can supply. To supply these properties, a small pump station exists whereby water flows through a restrictor into a small tank and is then pumped to a high level reservoir. This then feeds numerous restricted connections. This site is not connected to telemetry, with the pumps operating on the demand of the high/low level sensors in the reservoir.

Water is also currently supplied to a small area of the 88 Valley Rural Water Supply at the end of Mount Heslington Road. This water is supplied via restrictors and accounts for a maximum flow of $51m^3$ day. Unlike the other rural extensions, these properties are not technically part of the Brightwater scheme as they pay fees to the 88 Valley Rural Water Scheme.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.5.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment as critical are:

- Brightwater Network – at extreme risk to earthquake during and immediately after the event.

B.2.5.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Brightwater.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one transgression at the plant and one in the zone in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply:

- Brightwater has an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Brightwater complies, except for Main Road Hope from Aniseed Valley Road to Bateup Road.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Brightwater has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Brightwater has sufficient storage.

B.2.5.5 Asset Condition Overview

The scheme assets are generally in good condition. Many of the assets in the treatment plant have been upgraded in the last few years and the bore heads were upgraded in 2010. The telemetry was also upgraded to digital in the last few years.

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

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

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

B.2.5.6 Water Quality and DWSNZ Compliance

Required sampling - Brightwater supplies approximately 2,700 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter
- maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

Lead is also monitored in the reticulation three times per quarter. The treatment plant has online turbidity, pH and chlorine analysers.

Historical results - Between July 2006 and July 2011, 268 samples were taken from the zone with one transgression in 2007. One hundred and eighty five samples were taken from the plant with one transgression in 2010. Fifty-seven samples have also been taken and analysed for lead. None of these samples have shown a transgression.

B.2.5.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Hope/ Brightwater	GW	Three bores close together near Wairoa River.	NN020022	12/06/2003	31/05/2017

B.2.5.8 Current and Future Demands

The current demand is met by the Brightwater supply, however water restrictions are imposed to some degree most summers. There is the opportunity to provide emergency supply from the Richmond scheme to Brightwater to supply further properties at the Richmond end of the Hope extension. The daily water use is shown in Table B-9 below.

Table B-9: Current Demand of Brightwater Water Supply

Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
2,800	1,802	1,287	1,560	2,163

It is anticipated that in 2029 the demand in Brightwater is as follows:

- Average Day Demand – 2,113m^3/day.
- Peak Day Demand – 4,225m^3/day.

To manage the growing demand in Brightwater/Hope, Council are taking the following key measures:

- increase capacity source, either from a new Wakefield supply or a new allocation made available in the Waimea Plains through the construction of the Lee Valley Dam.

B.2.5.9 Strategic Studies

Various strategic studies have been undertaken to date for the Brightwater water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond, Wakefield, Waimea and Mapua Water Supply Network Model – January 2007.
- Richmond and Brightwater/Hope Water Demand Management Plan – August 2010.
- Water Demand Management Plan for the Tasman district – September 2011.
- Brightwater Public Health Risk Management Plan – November 2011.

B.2.5.10 Strategic Approach

The key issues for the Brightwater urban water supply are.

- the current source will not be able to accommodate future growth
- the ageing reticulation system will need to be replaced in the future
- water quality does not meet DWSNZ
- high renewal cost for water meters.

The strategic approaches to these issues are.

- To upgrade the treatment to meet DWSNZ.
- To increase source capacity. This may come from the allocation Council has from the Roding supply, new capacity provided by the new Wakefield Supply or new allocation made available in the Waimea Plains through the construction of the Lee Valley Dam.

Table B-10: Register of Assets for Brightwater Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
Brightwater / Hope	3 Bores – close to Waimea River Water Permit = 2,800m^3/day	<u>Brightwater Well field Lightband Road</u> Pump 1 Goulds 250 LZ07 5.8 KW Pump 2 - Aturia XB17B2 10hp Pump 3 - Grundfos SP77 5.5kW <u>Brightwater Main PS</u> Pump 1, 2 and 3 - Monoflow (20HP) <u>Teapot Valley PS</u> Lowara SV222 (3 kW)	Gas chlorination Chlorine Measurement pH measurement Turbidity Measurement UVT Measurement	Brightwater Reservoir 680m^3 Teapot Valley Reservoir 9m^3 Newly constructed reservoir 2500m^3 Teapot Lower Reservoir 4.5m^3	**Water Mains**	12mm 15mm 20mm 25mm 32mm 40mm 50mm 75mm 80mm 100mm 150mm 200mm 250mm **Total**	563m 2,208m 4,618m 13,351m 1,411m 7,187m 12,322m 179m 412m 5,263m 6,833m 5,595m 416m **60,356m**	Fire Hydrants 126 Valves 276 Water Meter...1,027

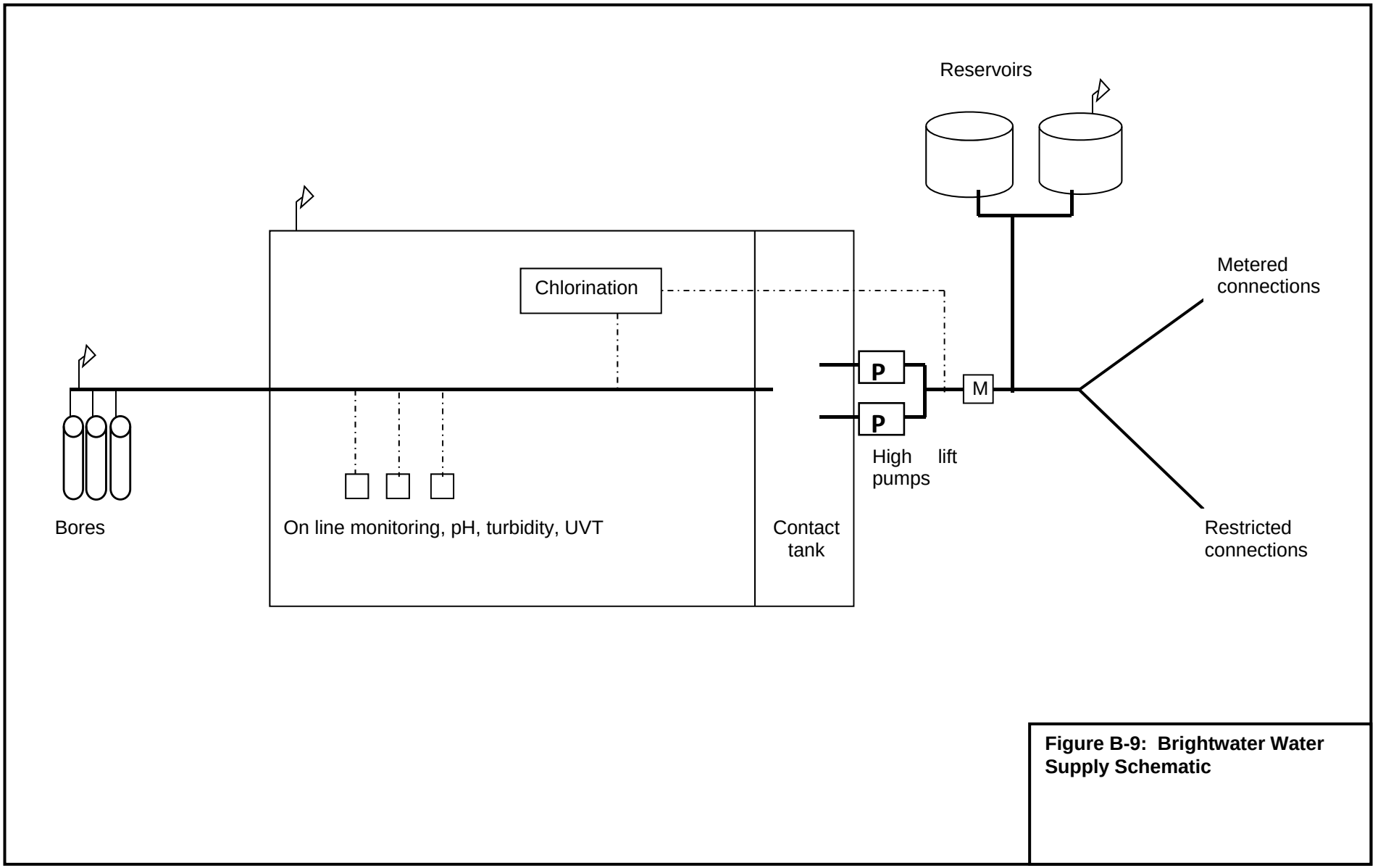


Figure B-9: Brightwater Water Supply Schematic

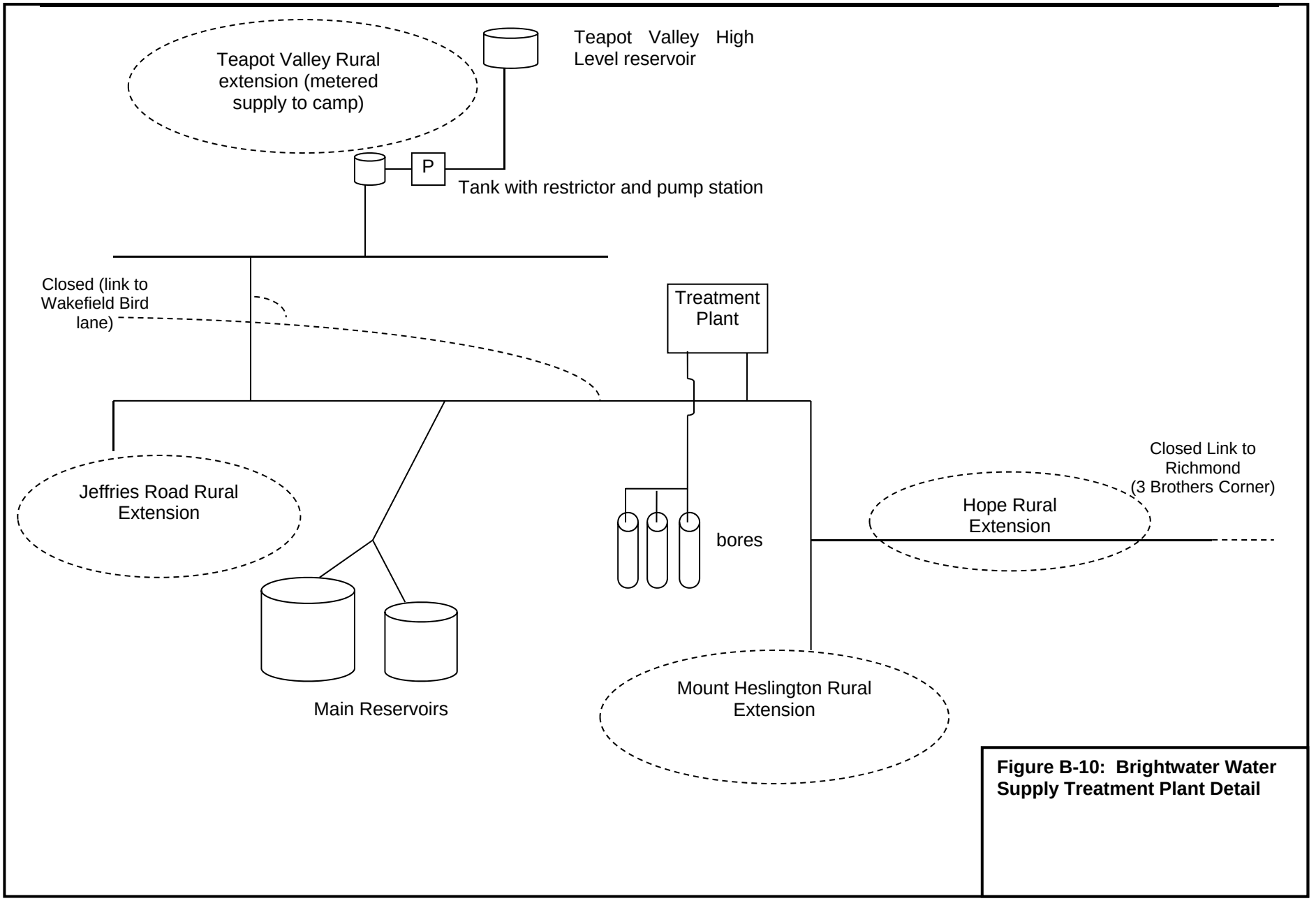


Figure B-10: Brightwater Water Supply Treatment Plant Detail

B.2.6. Tapawera Water Supply

B.2.6.1 System Description

Tapawera is supplied from two bores between the Motueka River and the village on the Tadmor Valley Road. The groundwater supply is unsecure because the bore screens are at a depth of less than 10m.

The water supply network in Tapawera was installed by the NZ Forestry Service in 1973, extended by Council in 1976, and fully handed over to Council in 1979 and further upgraded.

There are 150 metered connections on the Tapawera supply and there are no rural extensions supplied from the Tapawera scheme, although one person is supplied water through a low flow restrictor. The estimated population of Tapawera is approximately 360 people.

B.2.6.2 System Operation Overview

The system comprises:

- two bores with submersible pumps
- a treatment plant with chlorination and lime addition
- a contact tank
- two high lift pumps
- one reservoir ($270m^3$).

From the two bores the water is pumped to the treatment plant and then pumped into a $270m^3$ concrete reservoir where it flows, by gravity into the village.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.6.3 Key Lifelines

The Nelson Tasman Engineering Lifelines report 2008, confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.6.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Tapawera.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Tapawera for the past five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Tapawera has an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Tapawera meets the standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Tapawera does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

Tapawera has sufficient storage for the actual household demand. However, due to excessive leakage it does not have enough storage to last 24 hours at the current abstraction rate. Pipe replacement in 2011/2012 should allow the scheme to meet this LoS.

B.2.6.5 Asset Condition Overview

The majority of the reticulation is asbestos cement and polythene for the smaller rider mains with problems typical to those material pipes and may be a source of the high water loss reported. PE rider mains and copper service connections cause an on-going leakage problem. Some rider mains have been renewed to address this problem with a major renewal of copper laterals being undertaken in 2011/2012. Daily water demand has held at a more acceptable amount since the last leak detection survey and repairs in November 2009.

The bore headworks were upgraded in 2007 with funding obtained from the MoH Drinking Water Assistance Capital Assistance Programme. The power supply to the reservoir was also upgraded in 2006/2007 and the telemetry system upgraded to digital in 2007/2008.

B.2.6.6 Water Quality and DWSNZ Compliance

Required sampling - Tapawera supplies approximately 360 people, making it a 'small' supply (between 100 and 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out:

- in the zone, three samples per quarter , no more than 45 days apart on two different days
- at the plant, six samples a quarter, no more than 22 days apart, on three different days.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has online turbidity, pH and chlorine analysers connected to telemetry.

Historical results - Between July 2006 and June 2011, 64 samples were taken from the zone and 72 samples were taken from the plant. None of these were transgressions

B.2.6.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Tapawera	GW	Two adjacent bores on Tadmor Valley Road.	RM040256	11/08/2004	31/05/2019

B.2.6.8 Current and Future Demands

There are no significant demand issues within Tapawera and current growth projections predict negligible increase of new connections within the 20 year period. Therefore the source and water availability is not a limitation for the Tapawera system. The daily water use is shown in Table B-11below.

Table B-11: Current Demand of Tapawera Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
455	242	219[1]	230[2]	317[2]

[1]Due to excessive leakage in the scheme, the winter demand for 2010 was 406m^3/day. More recent data after leakage repairs from 2011 (March to September) shows a much lower demand.

[2] From October 2010 to September 2011

Future improvements to the network will further minimise leakage within the scheme, therefore reducing further demand on the network.

B.2.6.9 Strategic Studies

The key strategic study which has been undertaken to date for the Tapawera water supply system is as follows.

- Water Demand Management Plan for the Tasman district – September 2011.

B.2.6.10 Strategic Approach

There are no significant issues which require resolving within the Tapawera system. Strategic approach to the system includes:

- repair/renewal of pipes that have a history of failures
- replace failing copper laterals
- continuation of provision of effective and efficient operations and maintenance.

Table B-12: Register of Assets for Tapawera Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Tapawera	2 Bores – between Motueka River and Tapawera, on Tadmor Valley Road Water Permit = 455m^3/day	<u>107 Main Rd Source / Treatment Plant</u> Pump 1 – Grundfos SP46-2 3kW Pump 2 – Grundfos SP35/2 Pump 3 – Grundfos SP5/2 Highlift Pumps 2 x Southern Cross RGA 1 ¼ Newman11kW	Lime dosing for pH adjustment Gas chlorination Residual control Chlorine measurement Turbidity measurement pH measurement	107 Main Road Source / Treatment Plant 270m^3	**Water Mains**	12mm 15mm 20mm 25mm 40mm 50mm 75mm 80mm 100mm 150mm **Total**	94m 75m 434m 336m 220m 1,634m 175m 56m 3,594m 1,346m **7,963m**	Fire Hydrants Valves Water Metres	23 52 170

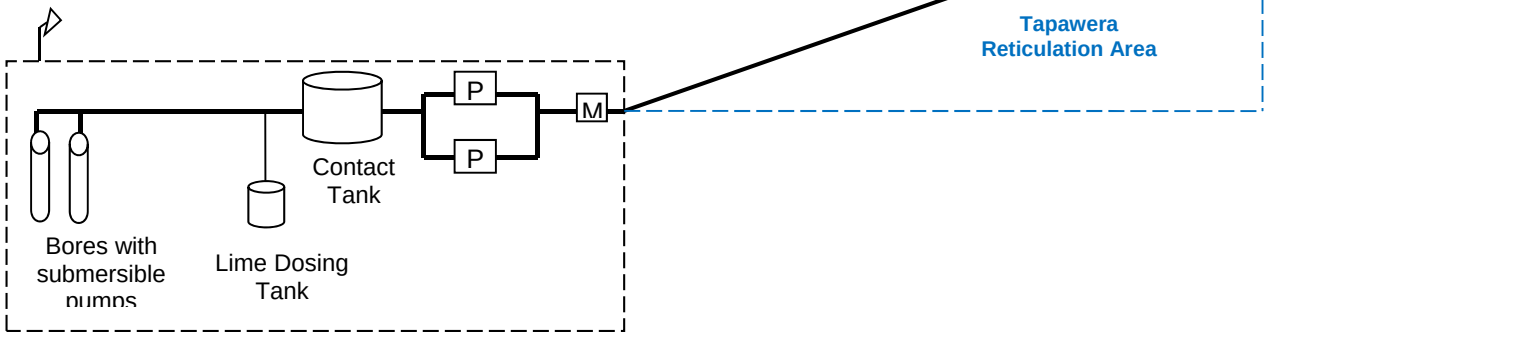


Figure B-11: Tapawera Water Scheme Schematic

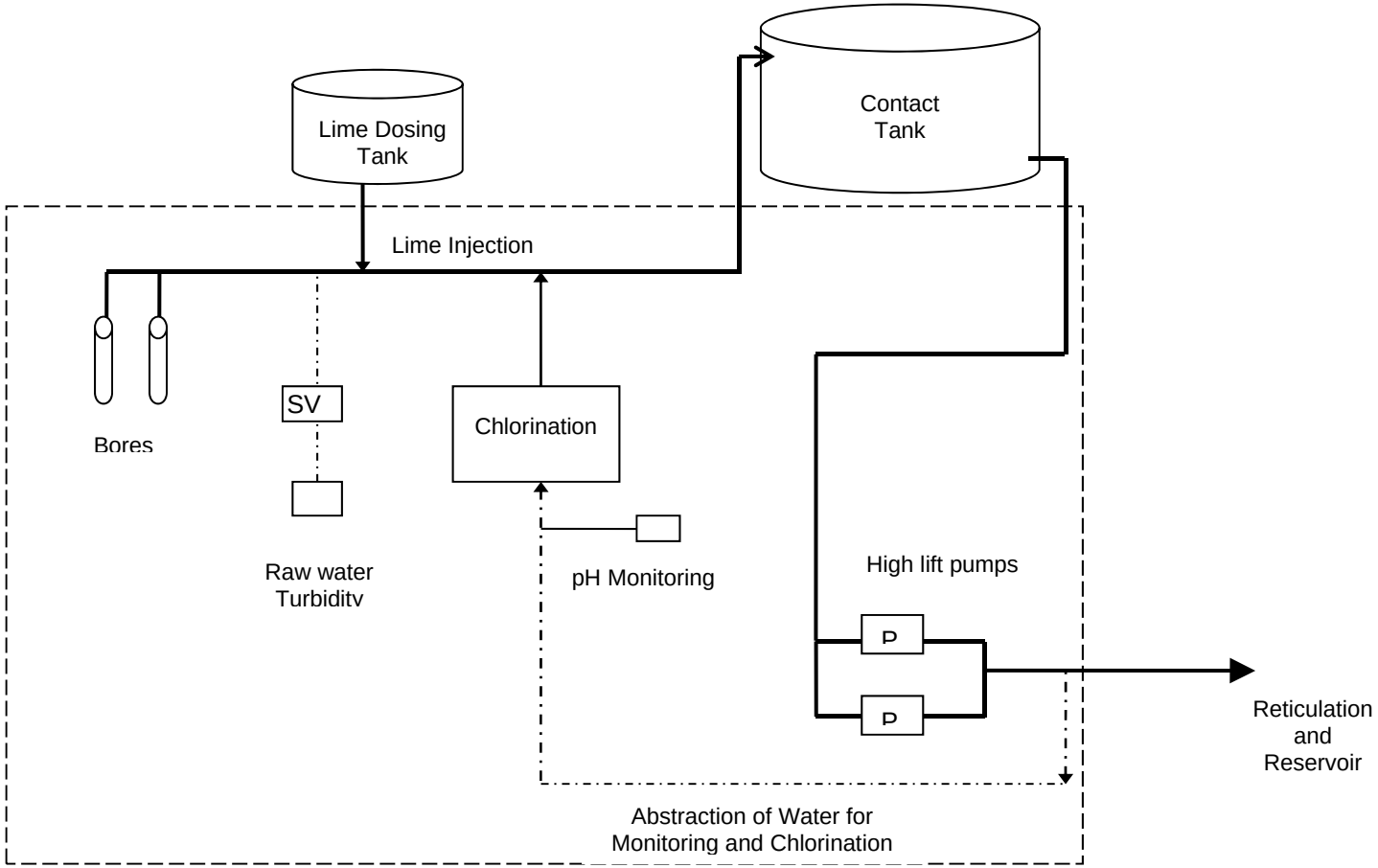


Figure B-12: Tapawera Water Scheme Treatment and Monitoring Detail

B.2.7. Murchison Water Supply

B.2.7.1 System Description

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

The Murchison water supply services the Murchison urban area, with an extension out to Longford.

There are 281 metered connections (June 2011) and two restricted connections. The estimated population of Murchison is approximately 680 people.

B.2.7.2 System Operation Overview

The water supply scheme in Murchison was built in 1975 and comprises:

- two bores
- one treatment plant consisting of an aeration tower and gas chlorination
- two high lift pumps
- one large reservoir (270 m^3) and four smaller plastic tanks (30m^3 each).

Bore pumps deliver water to the treatment plant which is situated in the old Tasman District Council depot in Fairfax Street. The treated water is then pumped into the main reservoir and also directly into the reticulation.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.7.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.7.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Murchison.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Murchison in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Murchison does not have an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Murchison meets the standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Murchison does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Murchison has sufficient storage.

B.2.7.5 Asset Condition Overview

The scheme assets are generally in good condition and the reservoir is in good structural condition.

The majority of the reticulation is asbestos cement and polythene for the smaller rider mains with typical problems for those material types. There has been an on-going programme to renew the PE rider mains which are coming to the end of their life.

Most of the unreliable pipes have been renewed. Recent rider main renewals and repairs following a leak detection survey in April 2008 have succeeded in maintaining a reduced daily water demand. This programme will continue as necessary.

The two source water bores/wells were replaced in July 2011.

B.2.7.6 Water Quality and DWSNZ Compliance

Required sampling - Murchison supplies approximately 680 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter
- maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

The treatment plant also has online turbidity, pH and chlorine analysers connected to telemetry.

Historical results - Between July 2006 and June 2011, 265 samples were taken from the zone and 265 samples were taken from the plant. None of these were transgressions.

B.2.7.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Murchison	GW	Two bores SW of township.	RM040976	11/07/2007	31/05/2020

B.2.7.8 Current and Future Demands

There are no significant demand issues within Murchison and the current growth projection is negligible over the next 20 year period. The daily water use is shown in Table B-13 below.

Table B-13: Current Demand of Murchison Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
750	288	221	261	410

Council have made an allowance to replace certain sections of polythene rider mains due to leakage issues. This will further reduce the demand on the network.

B.2.7.9 Strategic Studies

The key strategic study has been undertaken to date for the Murchison water supply system is as follows:

- Water Demand Management Plan for the Tasman district – September 2011.

B.2.7.10 Strategic Approach

There are no significant issues facing the Murchison water supply scheme except the upgrades required to meet DWSNZ. There is also a history of failures and water loss which will be addressed through repair and renewal of poor quality sections of pipe.

Table B-14: Register of Assets for Murchison Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Murchison	1 Well 1 Bore Besides the Matakitaki River Water Permit = 750m^3/day	92 Fairfax St Main PS Pump 1 – Ritz-New Haden 5.4hp1 Pump 2 – Lowara CN50-200 11 Kw Highlift pump 1 – Ajax 2LC 20 HP Highlift pump2 - Lowara CN50-200 11 Kw	Aeration for pH adjustment Gas chlorination pH Measurement Turbidity Measurement Chlorine Measurement	Chalgrave Street Reservoir 270m^3 4 x 30m^3	**Water Mains**	15mm 20mm 25mm 40mm 50mm 100mm 150mm **Total**	762m 480m 3,591m 3,239m 1,696m 1,752m 5,125m **16,646m**	Fire Hydrants Valves Water Meters	47 93 301

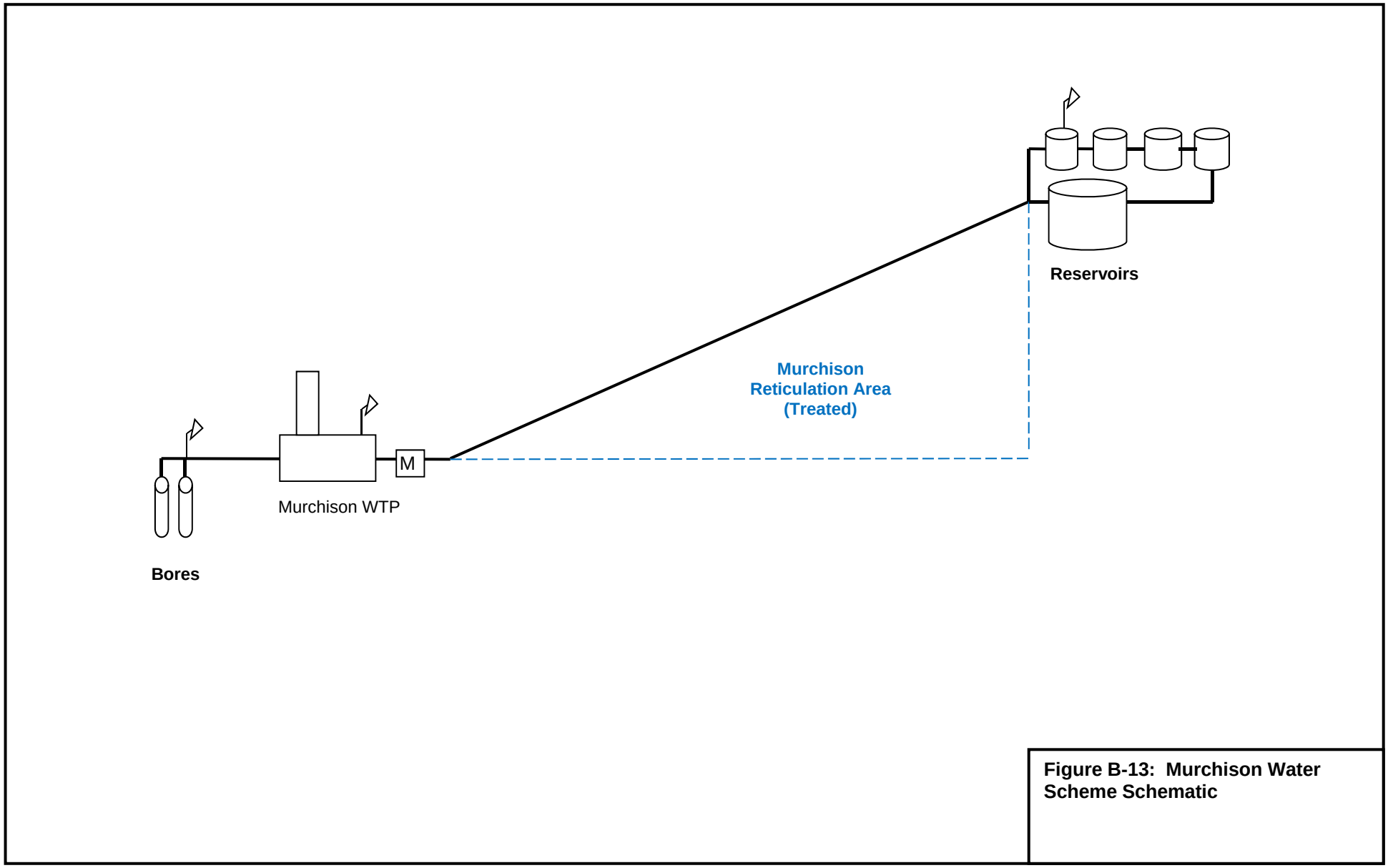


Figure B-13: Murchison Water Scheme Schematic

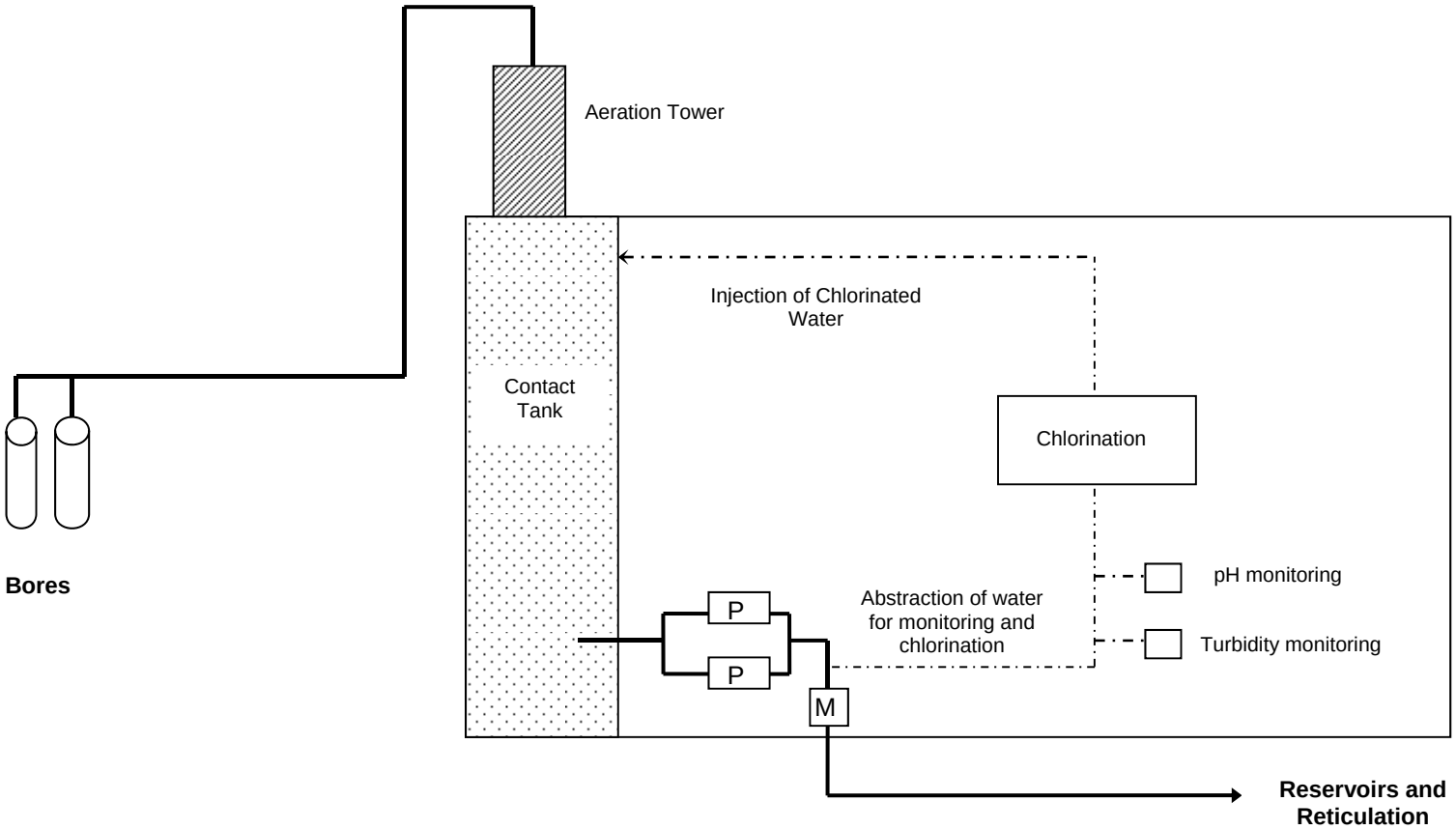


Figure B-14: Murchison Water Scheme Treatment Detail

B.2.8. Upper Takaka Water Supply

B.2.8.1 System Description

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

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

There are 18 metered connections (June 2011) and no rural extensions off the Upper Takaka scheme. The estimated population of Upper Takaka is approximately 40 people.

B.2.8.2 System Operation Overview

The system comprises:

- surface intake
- sedimentation tank
- break pressure tank
- treatment plant
- reservoirs (2 x 48m^3).

From the intake from Whiskey Creek the water passes through a sedimentation tank close to the intake before flowing by gravity to a break pressure tank and then to a treatment plant. Two filters in series (a multimedia and a macrolite filter) filter the water (by gravity) and the water then passes through a UV disinfection unit before entering two reservoirs next to the treatment plant. The two reservoirs are located on a ridge above the village and the supply flows into the reticulation by gravity.

There are no significant issues with the water supply system other than poor quality reticulation which will require a programme of renewal. The source water quality is poor during heavy rain, however a combination of selective source usage, a large storage volume and good filtration results in a good quality treated water with good continuity of supply. The water treatment system currently meets DWSNZ and is being operated under Section 10 as a small supply.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.8.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.8.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Upper Takaka.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Upper Takaka since the system was upgraded to meet DWSNZ in 2009.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Upper Takaka has an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Upper Takaka does not meet the fire fighting standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Upper Takaka does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Upper Takaka has sufficient storage.

B.2.8.5 Asset Condition Overview

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

Flows exceed resource consent levels due to historical agreements with property owners and some water likely being used for non-residential purposes. Investigations are on-going and projects are budgeted in the LTP to correct this.

B.2.8.6 Water Quality and DWSNZ Compliance

Required sampling – Upper Takaka supplies approximately 40 people, making it a 'neighbourhood' supply (between 25 and 100 people) in terms of the DWSNZ.

As the plant complies with the Section 10 requirements of the DWSNZ, monitoring of the plant is done as per the recommendations of the PHRMP. Currently this is three times a quarter to fit in with the required zone sampling (determined by the DWSNZ) of three times per quarter.

As the plant has UV treatment, to fully comply with the DWSNZ, the requirements of Section 5.16 of the DWSNZ must also be met. This requires that a minimum UV dose is always maintained. The treatment plant has an automatic system set up to shut off the source if the turbidity becomes too great. This ensures that the quality is always good enough for UV treatment. The UV unit also has an automatic shut off should the dose drop too low due to poor water quality or a fault with the UV unit.

The scheme has been operating as a Small Supply under Section 10 since UV was installed in mid-2009.

Historical results – Between July 2006 and June 2011, 99 samples were taken from the zone. Seventeen of these were transgressions. All transgression occurred before the upgrade, with the last transgression occurring in May 2009. Sixty eight samples were taken from the plant, with no transgressions.

B.2.8.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Upper Takaka	SW	Whiskey Creek (tributary of Takaka River).	RM100113, RM100120	16/3/2011	31/5/2034

B.2.8.8 Current and Future Demands

There are no plans to increase the water take volume to meet demand. Current growth predictions predict negligible difference over the next 20 years. The daily water use is shown in Table B-15 following.

Table B-15: Current Demand of Upper Takaka Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
23	28	11	17	42

There are no known leakage problems but about 80% of the reticulation needs to be renewed. There is currently no formal model of the system and knowledge of the system demand is unknown due to unmetered connections off the supply to local farmers.

Council is intending to upgrade this network in the near future.

B.2.8.9 Strategic Studies

Various strategic studies have been undertaken to date for the Upper Takaka water supply system.

- Upper Takaka Water Supply Public Health Risk Management Plan - March 2011.
- Water Demand Management Plan for the Tasman district – September 2011.

B.2.8.10 Strategic Approach

There are no significant issues with the water supply system other than poor quality reticulation which will require a programme of renewal.

The water treatment system has been upgraded with MoH funding to meet DWSNZ.

Table B-16: Register of Assets for Upper Takaka Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Upper Takaka	Whiskey Creek Water Permit = 23m^3/day	No pump stations.	50 Micron Amiad Screen Multimedia Filtration Macrolite Filtration UV disinfection	Upper Takaka Reservoir 2 x 48m^3	**Water Mains**	15mm 20mm 25mm 32mm 50mm 80mm 100mm 150mm **Total**	118m 45m 514m 186m 2,179m 12m 516m 9m **3,579m**	Fire Hydrants Valves Connections	2 11 19

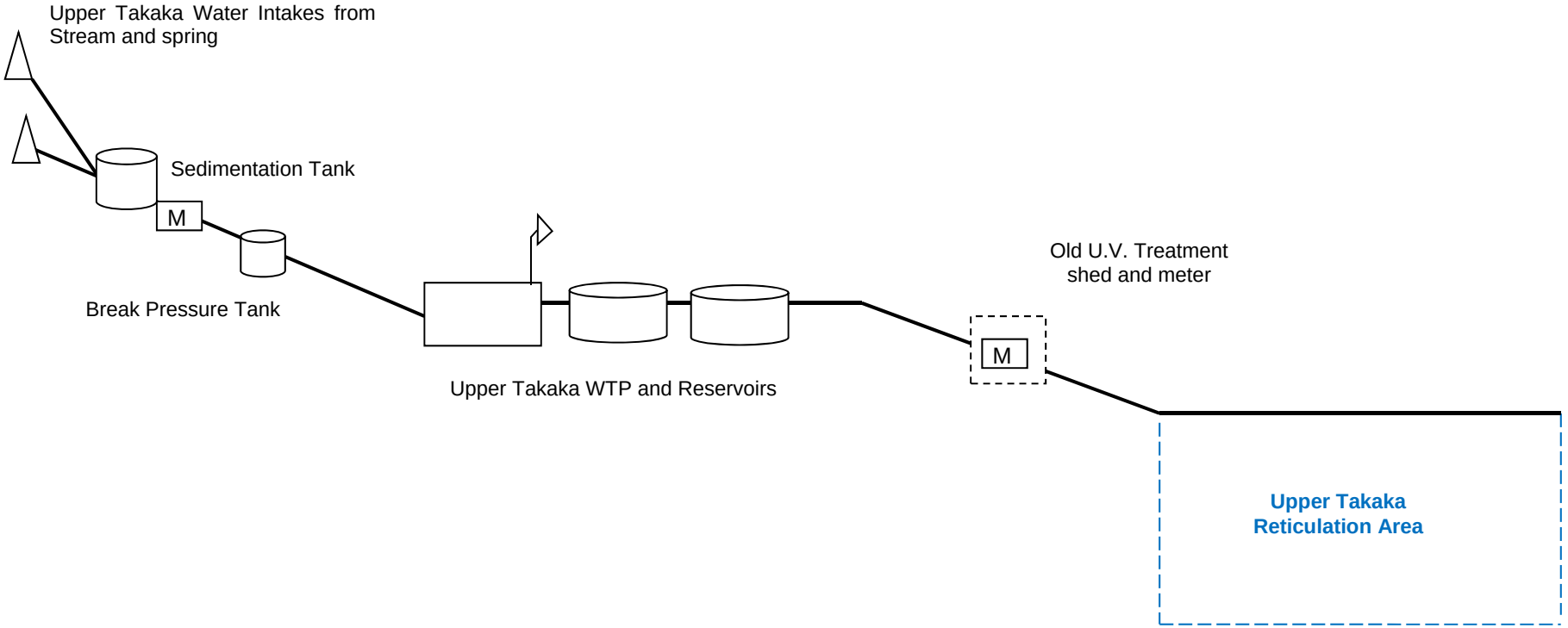
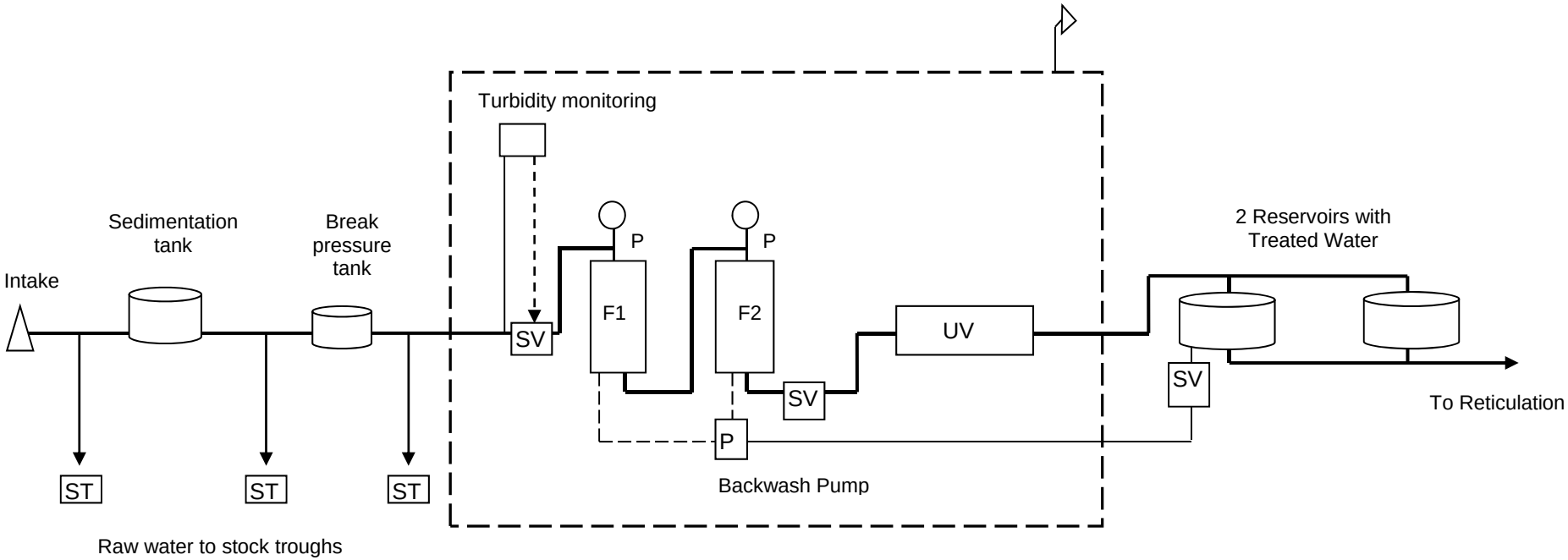


Figure B-15: Upper Takaka Water Scheme Schematic



- F1 – Multimedia Filter
- F2 – Macrolite Filter
- SV – Solenoid Valve
- ST – Stock Trough
- P – Pressure Gauge

Figure B-16: Upper Takaka Water Scheme Treatment and Monitoring Detail

B.2.9. Kaiteriteri Water Supply

B.2.9.1 System Description

The Kaiteriteri Water Supply obtains water from a bore at River Road in Riwaka, which is located in the road reserve approximately 200m from the State Highway. The Kaiteriteri source is hoped to be classed as secure groundwater but further review of monitoring compliance and hydrogeology is necessary to establish whether the source meets the standard for a secure supply.

The system has three supply zones, namely.

- From River Road to the No. 1 booster prior to the main reservoir. This includes Riwaka and Riwaka-Kaiteriteri Road to the No. 1 booster pump.
- From No. 1 booster pump to the main reservoir. This includes Tapu Bay, Stephens Bay, lower Kaiteriteri, Breaker Bay and Honeymoon Bay.
- From No. 2 booster to the high level reservoir. This includes all the high level areas of Kaiteriteri above Honeymoon Bay.

Kaiteriteri water supply was constructed in 1998. All properties at Tapu Bay, Stephens Bay, Little Kaiteriteri, Breaker Bay, and Honeymoon Bay are connected to the scheme, although not all of these properties use the water as some prefer to use their original rainwater storage supply. The supply also serves two large camping grounds which swell the population numbers using the scheme significantly in summer.

Some properties between the bore and Riwaka are connected to the scheme on a voluntary basis.

There are no difficulties with the performance of the system. Water quality is corrosive which if left unresolved may reduce the life expectance of some assets.

There is currently only one well but a spare pump is held in store at Brightwater.

There are 494 metered connections in use (June 2011) and no rural extensions off the Kaiteriteri scheme.

As Kaiteriteri is a holiday destination, most of the properties which use water are not inhabited throughout the year. This information is local knowledge, but can also be seen through the average water use and by looking at individual water meter accounts. For the six months in which the peak holiday time is not included, the average water use per property works out to be about one quarter to one third of normal water use for the district. For the six months which includes the peak holiday time, the use increases to around two thirds of normal usage. This usage is not likely to be spread evenly over the whole six months, rather most of the water will be used in the peak summer weeks between Christmas and the first week of January. The camp at Kaiteriteri becomes full and can hold 1,800 people.

If the normal off-peak water usage is only one quarter to one third of normal usage, it is probable that the normal permanent population (or temporary holiday population at any one time) is only one quarter or one third of the total number of meters using water. Therefore only approximately 124 to 163 meters or approximately 300 to 390 people are identified as the normal population. During the summer, the camp is known to be full, with holiday homes also in use, resulting in a total population of over 2,000 people in the Kaiteriteri area for around two weeks.

B.2.9.2 System Operation Overview

The system comprises:

- well source and pump
- lower booster pump station
- low level reservoir (700m^3)
- upper booster pump station
- high level reservoir (200m^3).

The water is pumped by the River Road well bore pump via a pressure line and booster pump to a 700m³ reservoir above Tapu Bay. The water then flows by gravity from this tank into the reticulation. An additional high level reservoir of 200m³ above Breaker Bay is supplied via a booster pump and services the Rowling Heights area.

A schematic drawing of the scheme is included at the end of this section.

B.2.9.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.9.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Kaiteriteri.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one non-compliance for Kaiteriteri in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Kaiteriteri does not have an approved PHRMP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Kaiteriteri meets fire fighting standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Kaiteriteri does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Kaiteriteri has sufficient storage.

B.2.9.5 Asset Condition Overview

The condition of most of the pipework in the system is good. There are no known specific condition concerns in the assets. Most of the infrastructure is of an age where condition problems are not expected and inspections by council staff, maintenance contractors and consultants have not identified any specific problems except upgrading required to the pumping station surrounds.

B.2.9.6 Water Quality and DWSNZ Compliance

Required sampling - Kaiteriteri has a permanent population of approximately 300 people, making it a 'small' supply (100 to 500 people) in terms of the DWSNZ. During the summer, when the population increases, the monitoring increases to comply with the scheme being a 'minor' supply (500-5,000 people).

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 1' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone during most of the year:

- 13 samples per quarter from the plant with a maximum of 13 days between samples and five different days of the week used
- three samples from the zone, with a maximum of 45 days between samples and two different days of the week used.

During the peak summer period, monitoring increases at the treatment plant to twice a week and in the zone to once a week to comply in line with the population size increase.

Historical results - Between July 2006 and June 2011, 95 samples were taken from the zone with no transgressions. One hundred and eighty nine were taken from the plant, with one transgression in 2010 of an unknown origin.

B.2.9.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater:

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Kaiteriteri	GW	One bore in Riwaka.	NN000255	26/07/2000	31/05/2015

B.2.9.8 Current and Future Demands

Four of the metered connections are in the Kaiteriteri Camp. These experience extremely high usage in the summer months from an influx of tourists to the area. The daily water use is shown in Table B-17 below.

Table B-17: Current Demand of Kaiteriteri Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
1,840	468	192	338	842

Plans are to develop an additional bore in the vicinity of the existing supply on River Road in Riwaka as part of the treatment upgrade to improve security of supply. There are no issues with meeting future demand as only 28 new connections are predicted within the next 20 years. Significant growth is expected beyond the 20 year horizon however.

B.2.9.9 Strategic Studies

The key strategic study which has been undertaken to date for the Kaiteriteri water supply system is as follows:

- Water Demand Management Plan for the Tasman district – September 2011.

B.2.9.10 Strategic Approach

The key issue for Kaiteriteri is the water supply does not meet DWSNZ. The strategic approach is to upgrade the treatment plant with pH correction.

Table B-18: Register of Assets for Kaiteriteri Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Kaiteriteri	1 Bore – River Road Water Permit = 1840m^3/day	River Road Well Goulds 8N 120-5 37 kW Kaiteriteri High Level Booster Pump Station Lowara SV16-06 5.5kW Kaiteriteri Lower Booster Pump Station 2 x Grundfos Premier 100x65x25 37 KW	No treatment is carried out.	Main Reservoir 700m^3 High Level Reservoir 200m^3	**Water Mains**	15mm 20mm 25mm 40mm 50mm 100mm 150mm 175mm 200mm **Total**	364m 1,719m 2,764m 1,252m 863m 3,306m 5,627m 6,038m 1,305m **23239m**	Fire Hydrants Valves Water meters	69 147 587

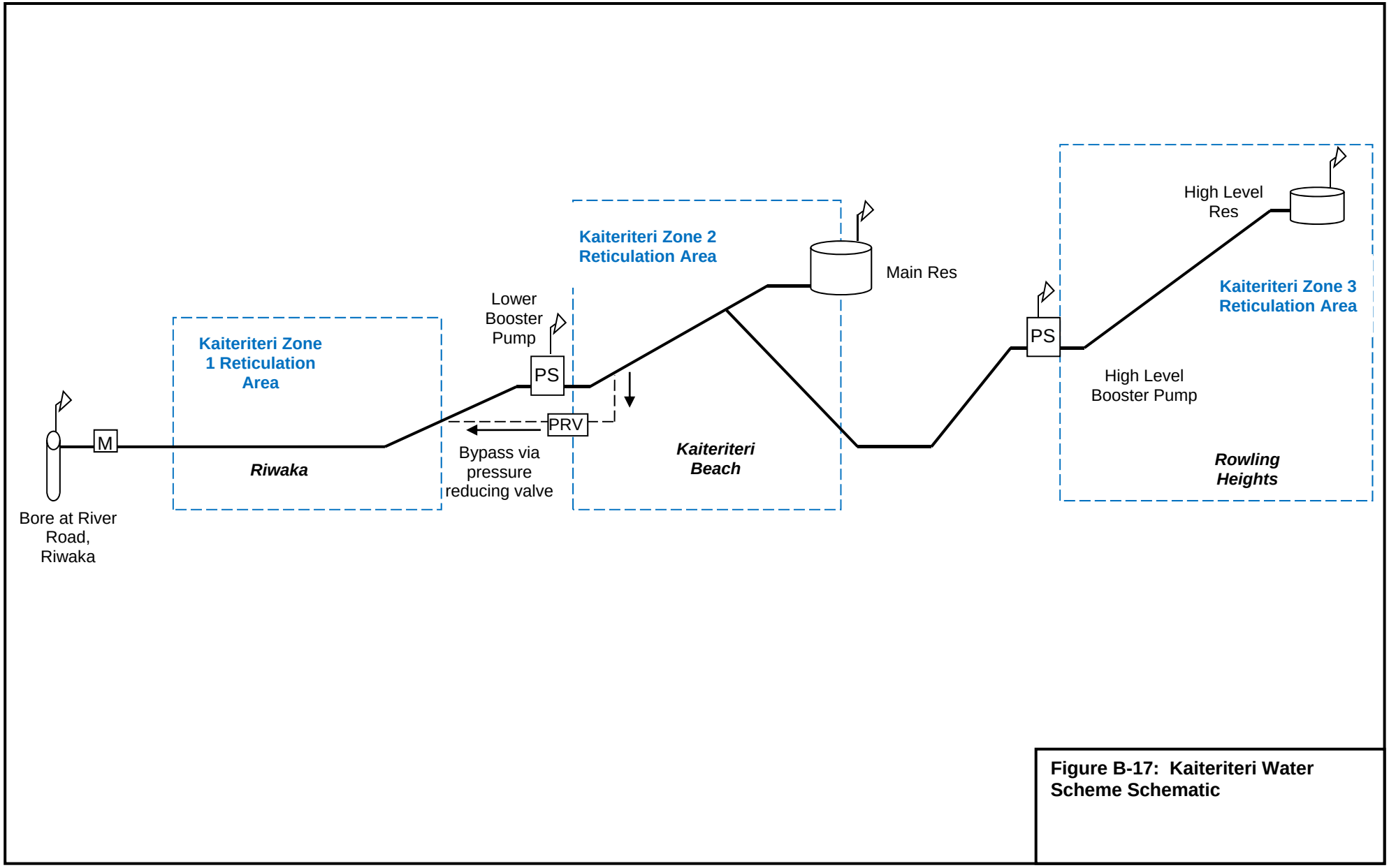


Figure B-17: Kaiteriteri Water Scheme Schematic

B.2.10. Collingwood Water Supply

B.2.10.1 System Description

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

There are 105 metered connections (June 2011) and one small rural extension at the end of Beach Road. The estimated population of Collingwood is approximately 250 people.

B.2.10.2 System Operation Overview

The system comprises:

- bore and submersible bore pump
- treatment plant consisting of aeration and lime correction
- two contact tanks
- two high lift pumps
- reservoir.

The bore pump transfers water to the treatment plant just south of the township. From the treatment plant, the water is pumped to the top of an aeration tower where it flows into a lime saturation tank. From there it overflows into two contact tanks. High lift pumps extract water from the tanks and pump it into the reservoir through a rising main. The town reticulation also feeds off the rising main.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.10.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.10.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Collingwood.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one non-compliance for Collingwood in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Collingwood PHRMP due to be submitted for approval by July 2012.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Collingwood meets fire fighting standards except for the south end of Beach Road and the high area around Swiftsure Street.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Collingwood does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Collingwood has sufficient storage.

B.2.10.5 Asset Condition Overview

Since the water supply for Collingwood has only recently been commissioned the assets are in excellent condition. The water supply scheme was designed to meet the needs of the community including the demands of any future growth.

B.2.10.6 Water Quality and DWSNZ Compliance

Required sampling - Collingwood supplies approximately 250 people, making it a 'small' supply (between 100 and 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant also has an online turbidity, pH and chlorine analyser.

Historical results - Between July 2006 and June 2011, 66 samples were taken from the zone with one transgression in 2007. Eighty six samples were taken from the plant with no transgressions.

B.2.10.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Collingwood	GW	One bore close to Aorere River, NW of township.	NN020325	30/10/2002	31/05/2019

A consent also exists for associated scheme structures, including a pipeline and a slab ford in a riverbed.

Scheme	Consent Type	Consent No.	Date Granted	Date Expiry
Collingwood	Construct and maintain a pipeline in the bed of a watercourse.	RM030480	04/06/2003	31/05/2019

B.2.10.8 Current and Future Demands

Very little growth is predicted for Collingwood. The Collingwood supply is designed to meet present and future demands. The daily water use is shown in Table B-19 below.

Table B-19: Current Demand of Collingwood Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
400	91	57	62	230

B.2.10.9 Strategic Studies

Two key strategic studies have been undertaken to date for the Collingwood water supply system, these are as follows:

- Water Demand Management Plan for the Tasman district – September 2011
- Leak detection monitoring in May 2011.

B.2.10.10 Strategic Approach

The key issues for the Collingwood urban water supply are:

- The Water Treatment Plant does not meet DWSNZ.

The strategic approaches to these issues are:

- Treatment Plant to be upgraded to meet DWSNZ.

Table B-20: Register of Assets for Collingwood Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Collingwood	1 Bore – besides the Aorere River Water Permit = 400m^3/day	Collingwood Bore Grundfos SP46-3 5.5 kW Collingwood PS 2 Grundfos CR 32-5 11 kW	Aeration Lime Saturator for pH correction. Gas chlorination Turbidity measurement Chlorine measurement, pH measurement.	Collingwood Reservoir 285m^3	**Water Mains**	15mm 20mm 25mm 40mm 50mm 80mm 100mm 150mm **Total**	117m 431m 1,062m 653m 2,823m 9m 2,099m 6,855m **14,050m**	Fire Hydrants Meter Valves	36 210 64

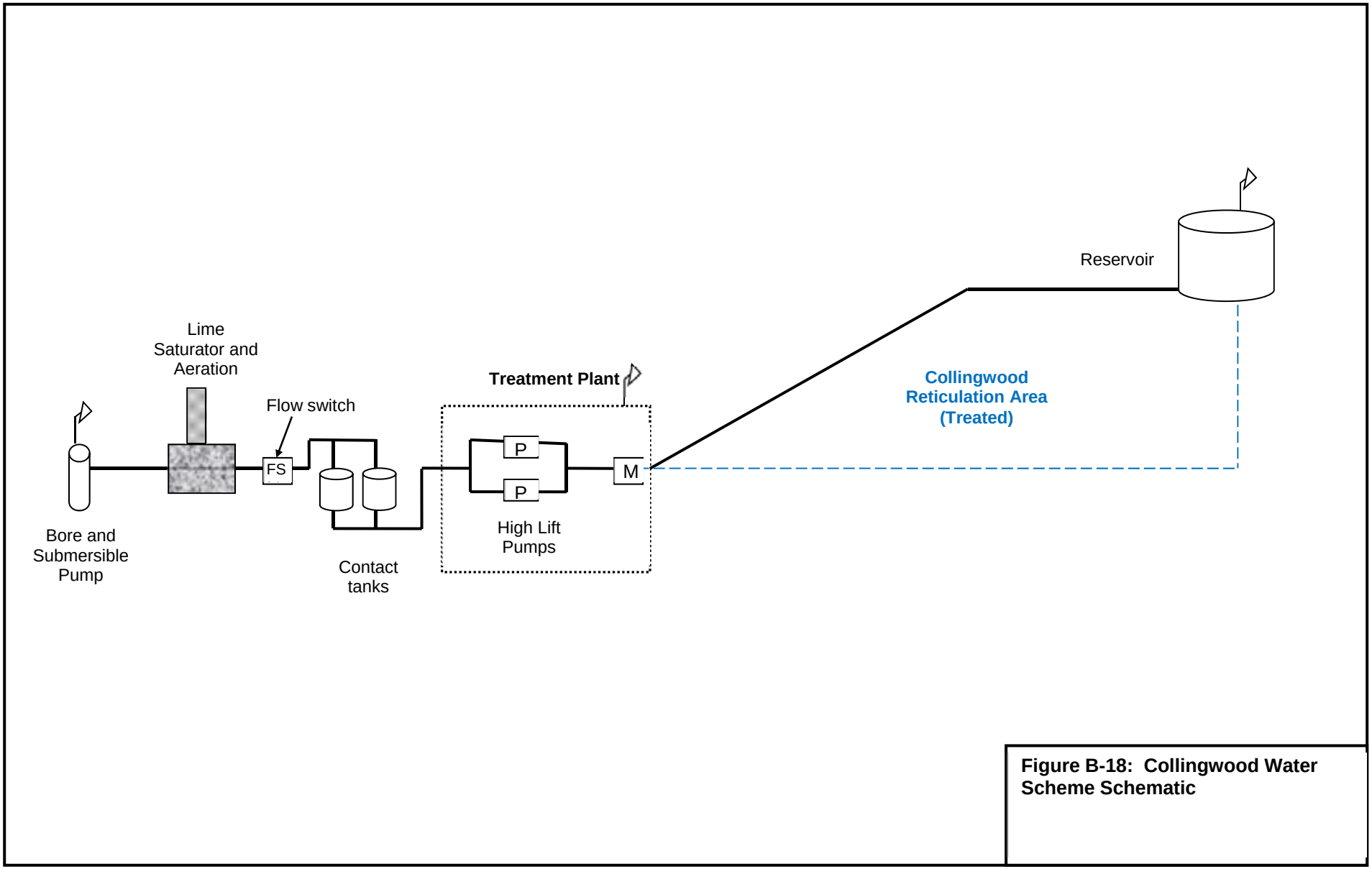


Figure B-18: Collingwood Water Scheme Schematic

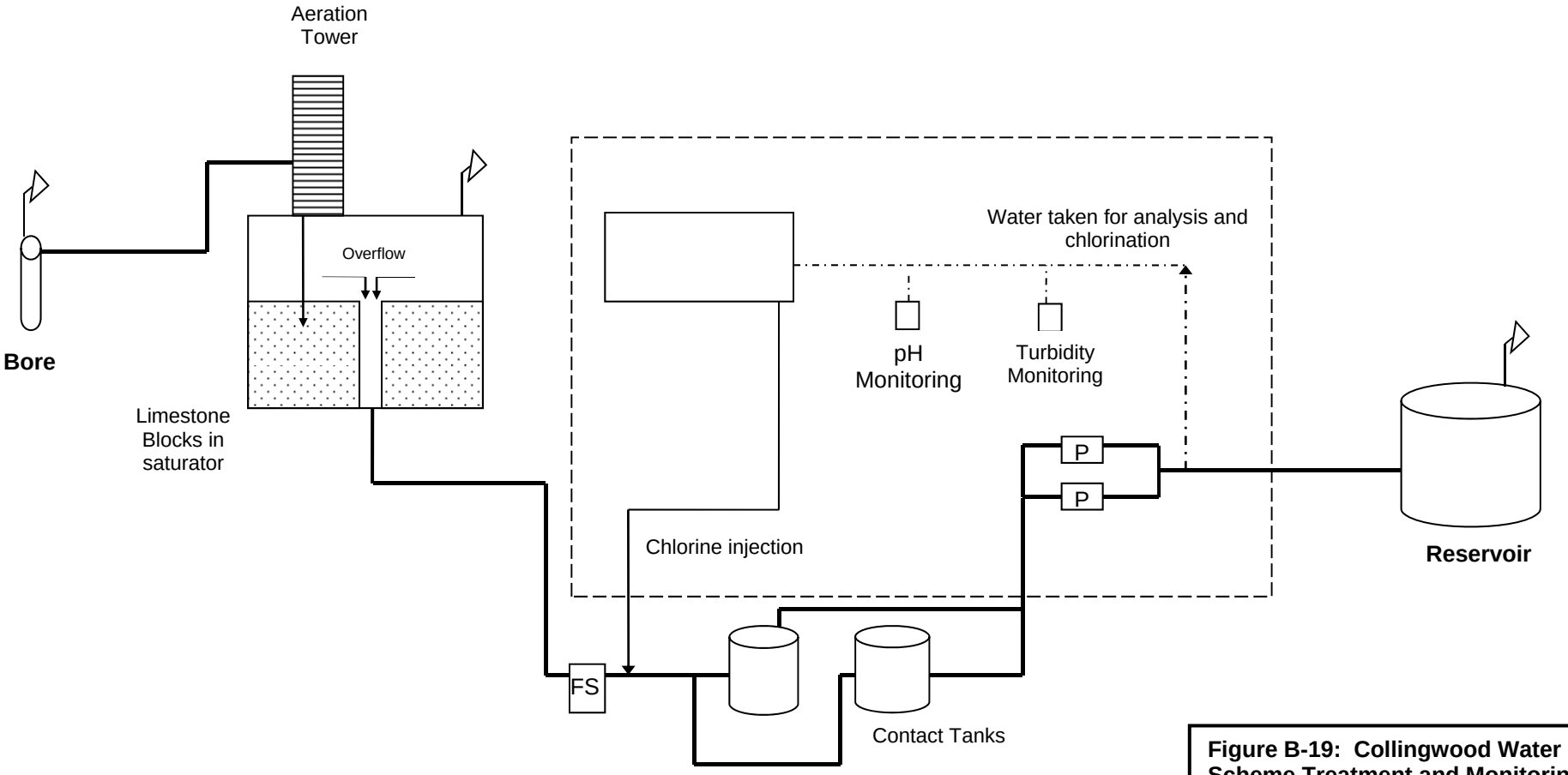


Figure B-19: Collingwood Water Scheme Treatment and Monitoring Detail

B.3 Rural Water Supplies

B.3.1. 88 Valley Rural Water Supply

B.3.1.1 System Description

The 88 Valley Rural Water Supply's source is an un-named stream locally known as Parkes Stream which is a tributary of the 88 Valley Stream. The intake is located in native bush in DoC administered land at a level of 230m above sea level. Water flows from this source by gravity to a reservoir (4 x 30,000 litre plastic tanks).

The 88 Valley Rural Water Supply serves the rural area from Parkes Stream (close to Wakefield) to Mt Heslington (mainly lifestyle blocks) further north (close to Brightwater).

The Waimea County Council constructed the 88 Valley rural scheme in 1981 with assistance from local farmers/landowners.

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

There are no metered connections and 167 restricted rural connections (May 2011). Based on the restrictor numbers, the maximum population of 88 Valley is likely to be 400 people. Some of the restrictors are to rural farm tanks and do not supply domestic properties.

Four hundred and sixty three units of water have been allocated within the scheme, with each unit being $1m^3$/day. Eighty four consumers have one unit or less, 37 have two units and 46 connections are for more than two units. It is likely that most one unit connections are for domestic properties. Connections above two units are likely to be for agricultural use.

B.3.1.2 System Operation Overview

The scheme comprises:

- stream intake
- chlorination at a small treatment plant reservoir.

The chlorination dosing system was upgraded in 2003 to a flow proportional system and moved to a more convenient location (with power) at a farm property known as Wantwood. This site does not yet have telemetry.

Apart from the chlorine dosing system, the scheme is a total gravity system with no pumps. Most of the reticulation is on private property.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.3.1.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.3.1.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for 88 Valley.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been two bacteriological non-compliances for 88 Valley plant in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- 88 Valley does not have an approved PHRMP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- 88 Valley does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- 88 Valley has sufficient storage for a rural supply.

B.3.1.5 Asset Condition Overview

The scheme assets are generally in good condition. The intake and pipe have been subjected to storm damage on several occasions and are repaired as necessary. There are no known issues with leakage, although as most of the pipes are through private rural land, leaks may go unnoticed for a long time.

B.3.1.6 Water Quality and DWSNZ Compliance

Required sampling – 88 Valley supplies approximately 400 people, making it a 'small' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has a turbidity, pH and chlorine analyser, however the treatment plant does not currently have telemetry.

Historical results - Between July 2006 and June 2011, 61 samples were taken from the zone, with no transgressions. Ninety one samples were taken from the plant with two transgressions.

B.3.1.7 Resource Consents

There are resource consents in place for the taking of surface water.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
88 Valley	SW	Parkes Stream (tributary of 88 Valley Stream).	RM041343 RM100828	02/12/2009 12/12/2010	30/11/2044 31/05/2016

A land use consent also exists for the existence, operation and maintenance of an existing weir, intake and pipeline in the bed of Parkes Stream.

Scheme	Consent Type	Consent No.	Date Granted	Date Expiry
88 Valley	Land use	RM061023	02/12/2009	30/11/2044

B.3.1.8 Current and Future Demands

As the scheme has only restricted connections, the demand is fairly steady across the day/week timescale. The winter demand is much less than the summer demand due to the large proportion of water being used for agricultural purposes. When assessing restricted connection use, a figure of 80% usage of each unit is generally applied. Therefore, whilst 463 units have been sold, a normal usage of only 370 is expected (as can be seen by the average summer demand). During drought conditions, however, the agricultural and lifestyle properties are expected to take their full allocation.

The scheme is fully allocated in terms of connections available and there is a waiting list of properties wishing to connect. New connections can only be made where already purchased units are split, usually during subdivision (eg. two units to one consumer split to supply one unit each to two consumers). There will be no future demand on the system as the water permit cannot be increased beyond 470 m^3/d. There are occasional supply difficulties in drought conditions where the scheme is running at full capacity. The daily water use is shown in Table B-21 below.

Table B-21: Current Demand of 88 Valley Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
470	367	280	325	453

There are plans to reduce the demands on the scheme in the future by supplying an area of the scheme with water from the Wakefield supply when the new source and treatment plant is constructed for this scheme. This may involve construction of new reservoirs and/or pump stations.

B.3.1.9 Strategic Studies

The key strategic studies within this water supply area are.

- Water Demand Management Plan for the Tasman district – September 2011.

B.3.1.10 Strategic Approach

The issues facing 88 Valley are.

- No new connections are allowed due to insufficient storage.
- Water quality does not comply with DWSNZ:2005 (Revised 2008) and to upgrade it to meet the standards would be expensive.
- The users of the water supply prefer to keep it simple and low cost and will resist proposals to install expensive treatment.

- The rural-residential growth south west of Wakefield is partially within the 88 Valley water supply area but cannot be supplied from 88 Valley. Therefore Wakefield and 88 Valley water supplies may in the future overlap.

The strategic approaches to these issues for 88 Valley are to.

- Depending on the strategic review for Wakefield, an upgrade of the water treatment to meet DWSNZ will be necessary. This will need to be worked through with the 88 Valley Rural Water Supply Committee.
- In the interim implement a 'boil water notice'.

Table B-22: Register of Assets for 88 Valley Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
88 Valley	Parkes Stream Water Permit = 470m^3/day	No pumps	Coarse Strainer at Meter Gas chlorination Chlorine Measurement	88 Valley Reservoir 4 x 30,000litre plastic tanks	Water Mains	15mm 20mm 25mm 32mm 40mm 50mm 80mm 100mm 125mm 150mm **Total**	344m 19,625m 16,399m 271m 6,184m 4,682m 5,722m 4,199m 2,169m 144m **59,739m**	Valves Restrictors	60 167

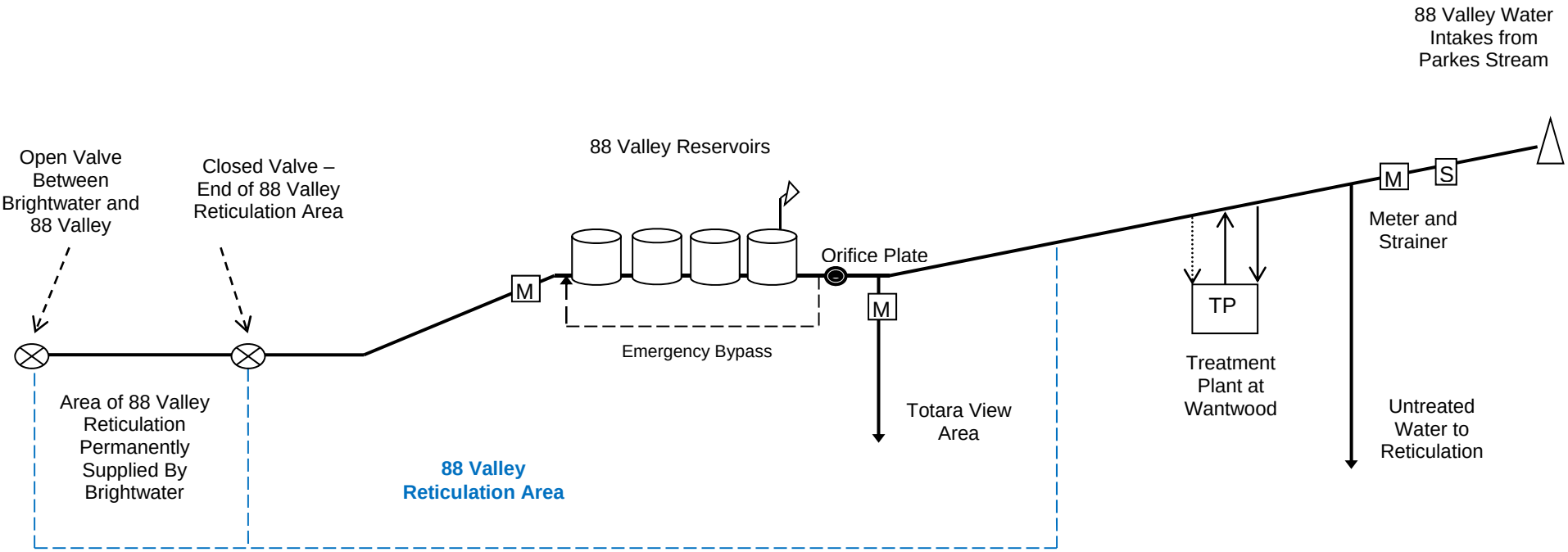


Figure B-20: 88 Valley Rural Water Scheme Schematic

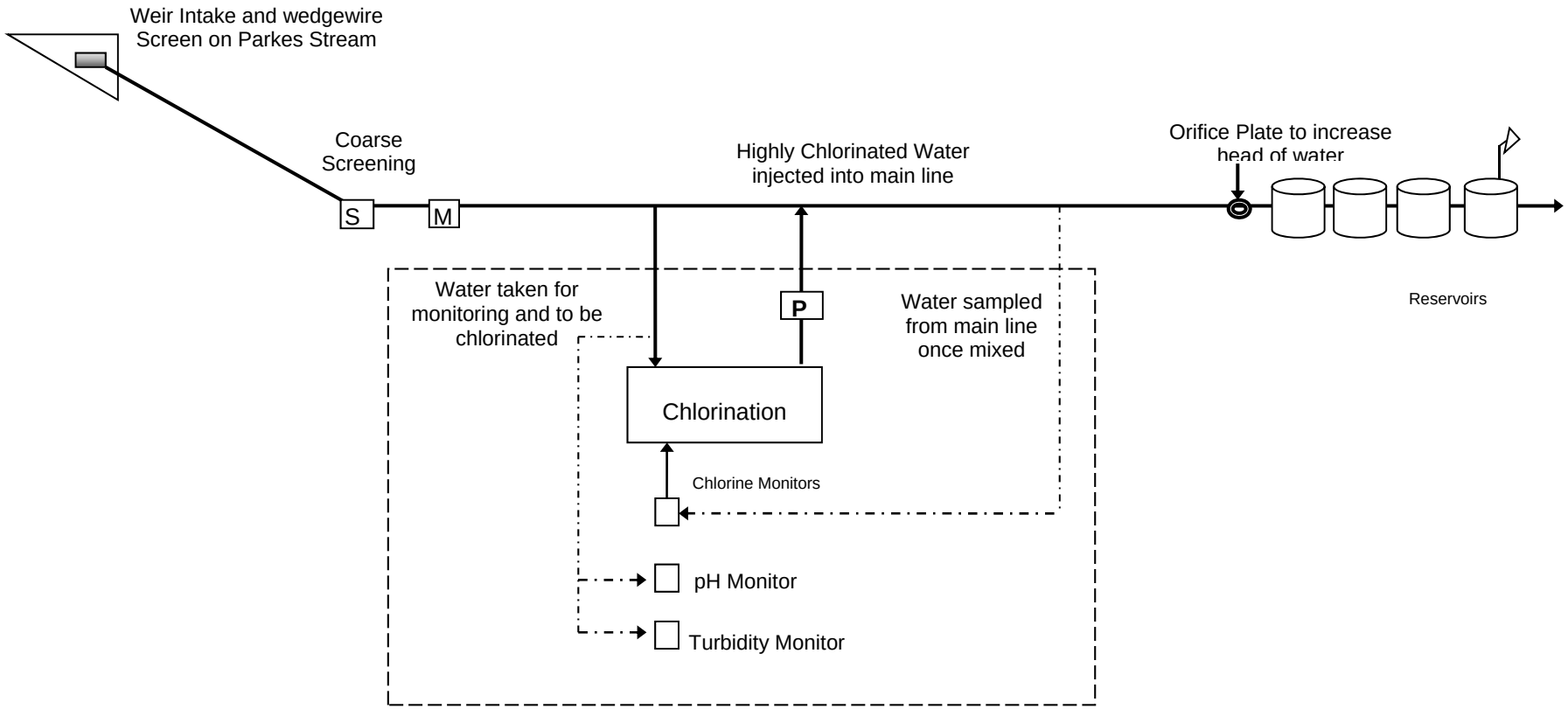


Figure B-21: 88 Valley Rural Water Scheme Treatment and Monitoring Detail

B.3.2. Dovedale Water Supply

B.3.2.1 System Description

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

The Dovedale rural water supply covers an area of approximately 140km^2, supplying properties in the Dovedale, Rosedale and Upper Moutere areas. The physical relief of the area is made up of deep valley systems flanked by high steep ridges and spurs. By necessity, many of the supply points to farm tanks are along the ridges and spurs while many of the domestic connections to houses are on the valley floors.

The scheme was constructed in 1977 as a community supply with a 1:1 government subsidy, available at the time for providing water for farming use. Since this time, the scheme has expanded greatly. There is a Management Committee made up of elected local representatives which assists Council with scheme administration and reports to the Engineering Services Committee.

There are no metered connections and 296 restricted rural connections (May 2011). As many of the connections are to rural farm tanks, with a few also to commercial properties (jam making factory, churches, fire service, shops etc) the number of connections is not in direct relation to the estimated supplied population. The estimated population of Dovedale is approximately 450-500 people.

A permanent boil water notice is in place for the scheme and has been since 1989. This is due to the poor quality of the source water (high turbidity), especially during heavy rain.

B.3.2.2 System Operation Overview

The scheme comprises:

- two stream intakes on Humphries Creek
- sedimentation tank (upper intake only)
- treatment plant with high pressure chlorine injection
- gravity flow to Thorn's Reservoir
- other pumping stations in Dovedale Basin
- pump to Silcock's Reservoir.
- supply via break pressure tank to Upper Moutere area.

From the upper intake, water is partially settled before it flows down towards the treatment plant on the Dovedale-Thorpe Road. When the lower intake is in use, water from this source is pumped into the main line at the treatment plant.

To disinfect the supply, a small amount of water is taken from the raw water line, chlorinated to a high level and injected back into the line. As the intake is at such a high elevation, water is able to be supplied from the intake, several kilometers to the east to Thorn's Reservoir by gravity alone.

The reticulation has a series of small pumps which boost water up valleys to storage tanks via a rising/falling main which supplies consumers en route. The smaller pumps are operated on timers and there are ball valves at the inlet to each storage tank which close when the reservoir is full causing the pumps to switch off on pressure.

There are two main reservoirs – Thorns (240 m^3) and Silcocks (68 m^3), four booster pump tanks – Wins (27 m^3), Knotts (14 m^3), Lower Tehepe (36 m^3), Upper Tehepe (14 m^3) in the Dovedale supply with a total of 400 m^3 storage. There are also two settlement tanks and six break pressure tanks. This is equivalent to a total of 10 hours storage.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.3.2.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.3.2.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Dovedale.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been 14 bacteriological transgressions for the Dovedale supply in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Dovedale does not have an approved PHRMP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Dovedale does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Dovedale has sufficient storage for a rural supply.

B.3.2.5 Asset Condition Overview

The majority of the reticulation in the Dovedale scheme is unreliable. There have been continual problems with PVC pipe joints and splitting of polythene pipes ever since the scheme was constructed. The main reason for polythene failure is degradation of the material, which becomes brittle with time. Some of the larger diameter pipes were constructed in AC and there have also been problems with these pipes. There is on-going pipeline renewal.

B.3.2.6 Water Quality and DWSNZ Compliance

Required sampling - Dovedale supplies approximately 450 people, making it a ‘’small’ supply (<500 people) in terms of the DWSNZ.

Even though the scheme has a permanent boil water notice in place as a precaution, it is operated and monitored as a normal supply. The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that is currently used is ‘Criteria 2B’ for plant samples and ‘Criteria 6A’ for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has online turbidity, pH and chlorine analysers.

Historical results - Between July 2006 and June 2011, 90 samples were taken from the zone, with 11 transgressions. Ninety six samples were taken from the plant and three of these were transgressions.

B.3.2.7 Resource Consents

There are three resource consents in place for the taking of surface water and the use of land for associated structures.

Scheme	Source Locations/ Consent Detail	Consent No.	Date Granted	Date Expiry
Dovedale	Water take from Humphries Creek (tributary of the River Dove).	RM100114	14/03/2011	31/05/2033*
Dovedale	Water permit to dam Humphries Creek.	RM100116	14/03/2011	31/05/2033
Dovedale	Land use consent existence and maintenance of pipes and structures within riverbed.	RM100117	14/03/2011	31/05/2033

*has review condition in 2017

B.3.2.8 Current and Future Demands

The scheme was assessed as 'fully allocated' in 2005, when 90% of the units were sold, with no new units sold since. Each water unit within the Dovedale supply scheme equates to $2m^3$ with 484 units sold.

When subdivisions occur within the water supply area, an existing water user can reallocate their units to new properties, and these units will be split. Whilst there is an official waiting list, should units ever be rescinded, it is a condition of the resource consent that they are not reallocated. The waiting list will only be activated if the scheme's consented take increases (eg. if a new source is developed).

According to the most recent data available, there are 296 restricted rural connections (2011) currently being used. A figure of 80% usage is applied to restricted supplies to work out normal expected usage. Eighty percent of 484 units is $774m^3$/day, which is lower than the average demand suggesting a higher proportion of agricultural/commercial use, illegal connections or a large amount of leakage. The daily water use is shown in Table B-23 below.

Table B-23: Current Demand of Dovedale Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
1,080	886	872	881	977

Water quantity is not sufficient at the high level intake in summer as flow diminishes. Due to groundwater recharge and some small tributaries the lower intake usually has a greater flow (but is of poorer quality). The lower intake is usually run for a maximum of three months each summer, however prolonged drought can result in further usage.

Development of a new source is required to be able to provide water to those on the waiting list and allow for growth in the area. A larger water volume has been allocated in the TRMP for a new groundwater supply close to the Motueka River.

B.3.2.9 Strategic Studies

Strategic studies which have been undertaken to date for the Dovedale water supply system include:

- Water Demand Management Plan for the Tasman district – September 2011.

B.3.2.10 Strategic Approach

The key issues with the Dovedale scheme are.

- Some of the rural water supply pipes are having high failure rates. Over such a large area, such failures and leaks can be very difficult to detect and it is expensive to do so.
- The water for Dovedale is abstracted from a surface water source and therefore the water quality is variable and does not meet DWSNZ. There has been a permanent 'boil water notice' in place since 1989.
- The system is effectively at capacity. In order to serve any new connections, reticulation upgrades are needed and additional source capacity is needed.

The strategic approaches to these issues are to.

- Undertake an affordability check to confirm whether a new source in Motueka Valley River is to be constructed.
- Install new treatment facilities to meet DWSNZ requirements on existing supply or on new supply.
- Continue to identify pipelines that require replacement and replace them as funds allow.
- If part of the supply area is transferred on to the 'Coastal Pipeline' scheme, these properties will be limited to 1.5m^3/day.

Table B-24: Register of Assets for Dovedale Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
Dovedale	Humphries Creek Water Permit = 1080m^3/day	<u>Humphries Creek PS</u> Grundfos CR16-40 11kW <u>Knots PS</u> 2 x Lowara SV2-24 3kW <u>Lower Tehepe PS</u> 2 x Lowara SV4-24 4kW <u>Upper Tehepe PS</u> Pump 1 – Grundfos CP3-160 4hp Pump 2 – Lowara SV4-18 3kW <u>Wins PS</u> Pumps – Lowara SV8-16 7.5kW <u>Thorns PS</u> 2 x Grundfos CR30-160 22kW	Sedimentation Gas chlorination with residual control Chlorine Measurement Turbidity Measurement pH Measurement	H.L. Intake 6.8m^3 2 x 30m^3 L.L. Intake 2 x 30m^3 <u>Reservoirs</u> Knots Reservoir 25m^3 Lower Tehepe Reservoir 14m^3 Silcocks Reservoir 68m^3 Thorns Reservoir 8 x 30m^3 Upper Tehepe Reservoir 14m^3 Wins Reservoir 2x14m^3 <u>Break Pressure Tanks</u> Bensemanns BP Tank 9m^3 Beuke BP Tank 14m^3 Moores BP Tank 4.5m^3 Neudorf Hill BP Tank 23m^3 Rosedale Saddle BP Tank 4.5m^3 Rose Road BP Tank Blackbird Valley BP Tank 4.5m^3 Old House BP Tank 30m^3 <u>Pump Stations</u> Humphries Creek PS 5000 Gallo Knots PS 5000 Gallons Lower Tehepe PS 5000 Gallons Upper Tehepe PS 5000 Gallons Thorns PS 5000 Gallons Winns PS 5000 Gallons	Water Mains	15mm 20mm 25mm 32mm 40mm 50mm 65mm 80mm 100mm 125mm 150mm 175mm **Total**	1,033m 48,211m 37,143m 8,985m 15,452m 15,493m 11,169m 4,697m 2,485m 2,940m 7,895m 170m **155,674m**	Fire Hydrants 3 Valves 149 Restrictors 296

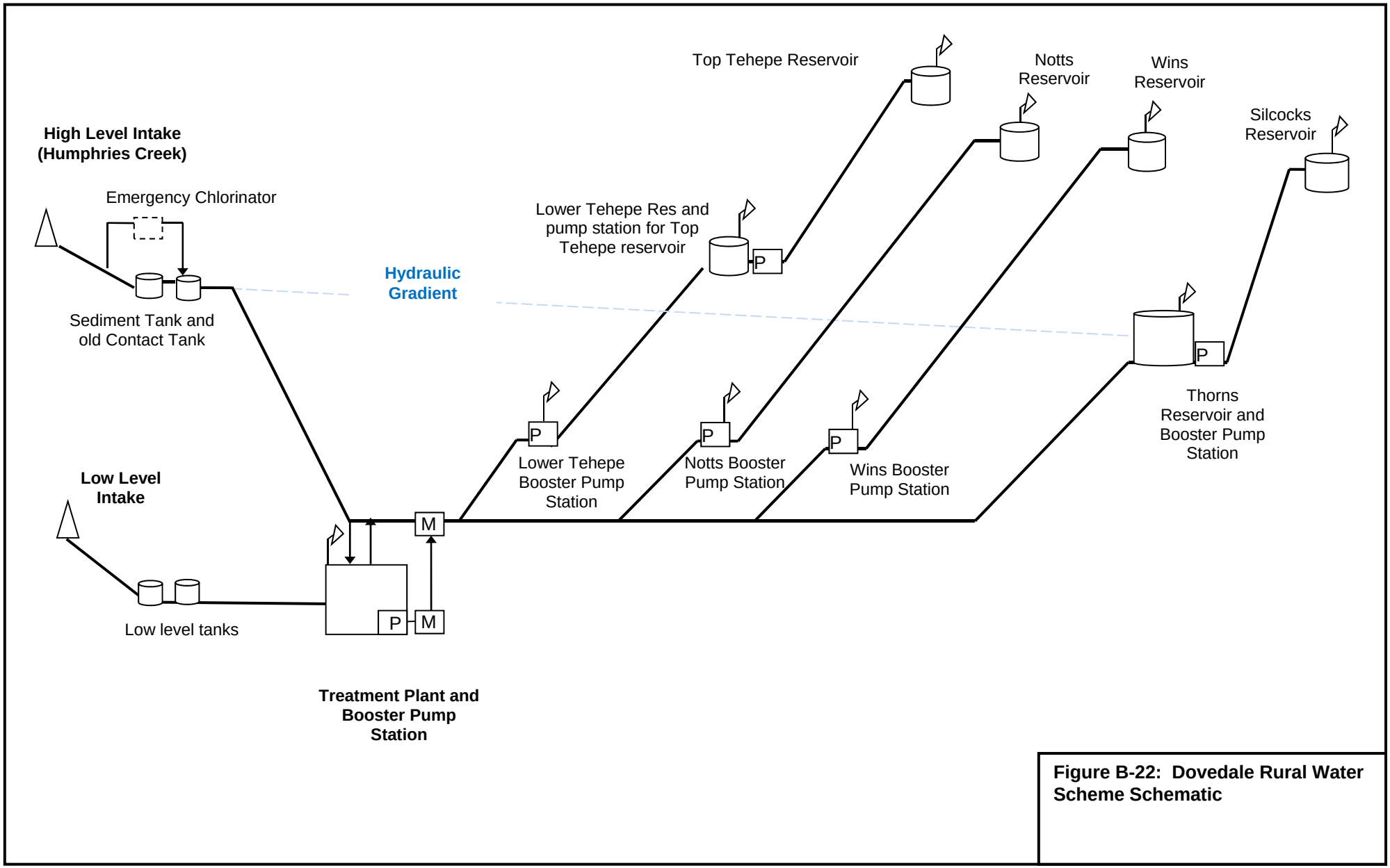


Figure B-22: Dovedale Rural Water Scheme Schematic

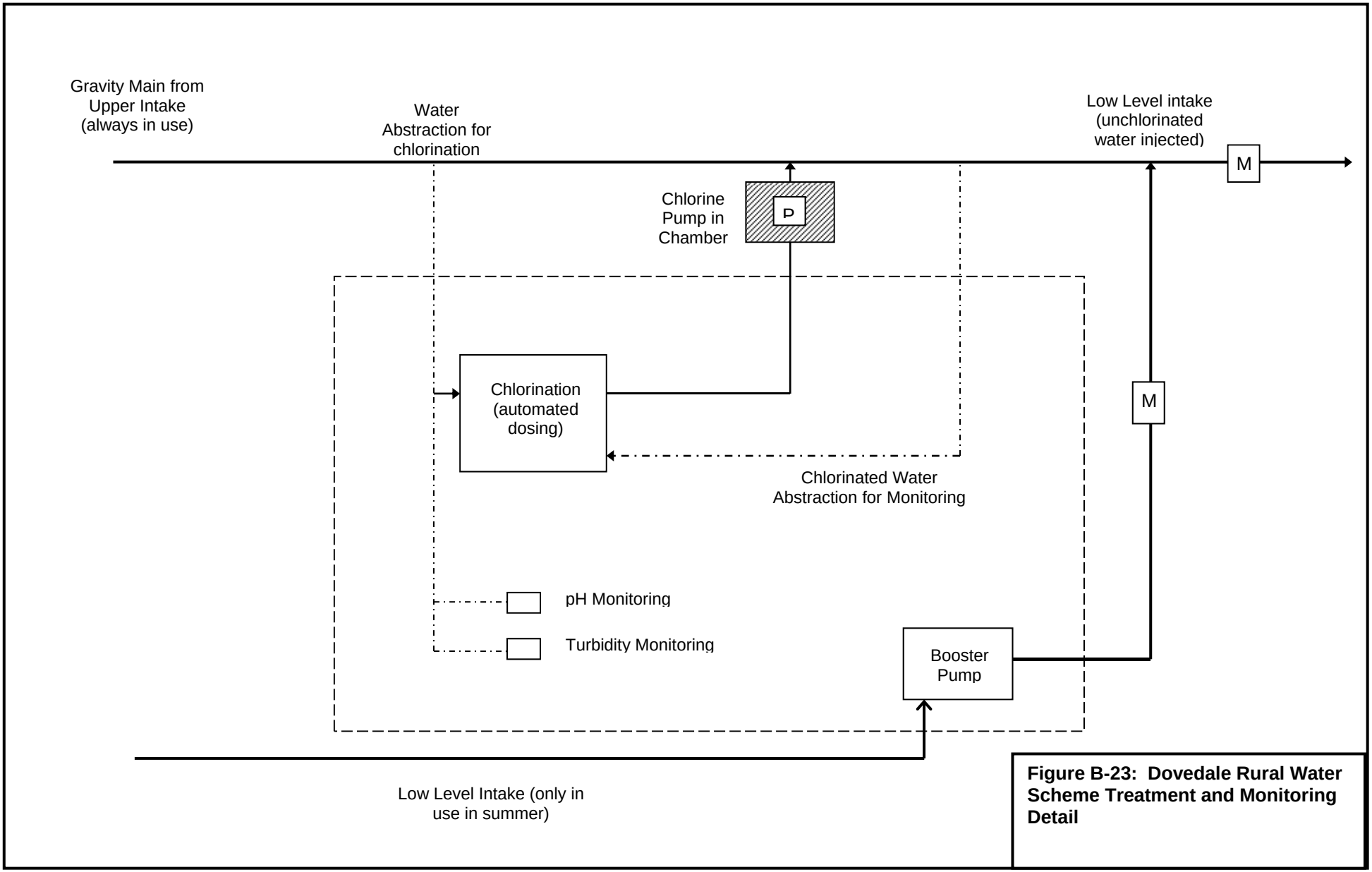


Figure B-23: Dovedale Rural Water Scheme Treatment and Monitoring Detail

B.3.3. Redwood Valley Water Supplies: Redwood Valley 1 and Redwood Valley 2

B.3.3.1 System Description

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

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

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

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

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

There are no metered connections on either scheme, Redwood Valley 1 has 97 connections and Redwood Valley 2 has 265 (May 2011). Each unit in the Redwoods' scheme is $2m^3$. Not all of the connections within the schemes are to residential properties. Several are to vacant lots yet to be developed and many are to business /commercial /agricultural premises. The registered population of Redwood Valley 2 is 370 people and the registered population of Redwood Valley 1 is 180. This population should be re-assessed and re-registered if necessary.

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

B.3.3.2 System Operation Overview

Both Redwood Valley 1 and 2 systems comprise:

- well/bore pumps
- supplementary bore at River Road
- aeration towers
- chlorination
- contact tanks
- high lift pumps
- Redwood Valley 1 has two reservoir sites
- Redwood Valley 2 has one reservoir site (6 x $25m^3$ tanks).

Redwood Valley 1 has two pressure zones, a high level zone with a reservoir at a level of 239m (Top Reservoir) and a low level zone with a reservoir at a level of 163 m (Langs Reservoir). Redwood Valley 2 has a small high level pressure zone supplied by Maisey Road booster pump station to a small reservoir on the Moutere Highway.

The main pumps are controlled by reservoir level signals through the DATRAN control (telemetry). The smaller booster pumps are on timers and pressure switches.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.3.3.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from Vulnerability Assessment as critical.

B.3.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Redwood Valley.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for either Redwood Valley scheme in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Neither Redwood Valley supply has an approved PHRMP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Redwood Valley does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Redwood Valley has sufficient storage for a rural supply.

B.3.3.5 Asset Condition Overview

Some of the reticulation in the Redwood Valley scheme is unreliable. Lang's reservoir is in poor condition and is leaking. Repairs were undertaken in 2010 to reduce this leakage. This needs to be rebuilt and may be relocated due to access issues. The associated booster pump station should also be relocated due to access difficulties. Most of the infrastructure is of an age where condition problems are occasionally expected and inspections by Council staff, maintenance contractors and consultants have not identified any specific problems. As breaks occur pipelines are repaired and sections replaced. Some of the pipelines in the poorest condition have been renewed or upgraded. This programme is on-going as long as necessary.

B.3.3.6 Water Quality and DWSNZ Compliance

Required sampling – Both Redwood Valley supplies are small supplies (100 to 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone, to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has online turbidity, pH and chlorine analysers.

Historical results - Between July 2006 and June 2011, 62 and 63 samples were taken respectively from the Redwood Valley 1 and Redwood Valley 2 zones. Eighty six samples were taken from both plants. No transgressions were recorded.

B.3.3.7 Resource Consents

There are three resource consents in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Redwood Valley 1	GW	Golden Hills well.	NN970139	11/04/2002	31/05/2017
Redwood Valley 1 and 2	GW	River Road bore.	RM110193	15/07/2011	31/05/2017
Redwood Valley 2	GW	O'Connor Creek bore.	RM110191	15/07/2011	31/05/2017

A land use consent also exists for the construction, existence and continued maintenance of a pipeline in the bed of O'Connor Creek.

Scheme	Consent type	Consent No.	Date Granted	Date Expiry
Redwood Valley 2	Land use	RM041164	04/11/2004	31/05/2028

B.3.3.8 Current and Future Demands

According to the most recent data available, there are no metered connections and 363 restricted rural connections (rural restrictor billing information, May 2011) currently being used. The daily water use is shown in Table B-26 below.

Table B-25: Current Demand of Redwood Valley Water Supply

Source	Water Permit (m^3/d)	Average Summer demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
O'Connor Creek	350	537	396	457	364
Golden Hills	200	314	202	252	232
River Road	600	433	399	416	539
Total	1,150	1,284	997	1,125	1,135

The scheme is fully allocated in terms of connections available and there is a waiting list of properties wishing to connect. There will be no future demand on the system as the water permit cannot increase beyond the current permit.

A new bore has recently been added at O'Connor Creek to replace an old bore which has poor yield. This will allow this site to take more water (closer to its consented amount) and thus reduce the reliance on the River Road source. During dry summers the take from River Road was close to its consented amount, especially when rationing was in force.

B.3.3.9 Strategic Studies

The key strategic studies within this water supply area are.

- Redwood Valley Public Health Risk Management Plan – due by July 2012
- Water Demand Management Plan for the Tasman district – September 2011.

B.3.3.10 Strategic Approach

Redwood Valley Rural Water Supply scheme faces a number of issues.

- The Redwood Valley Rural Water scheme extends over large areas in mostly small diameter pipes. Growth and connections to the scheme could never be forecast with certainty and while caution and control has been exercised, the development of the scheme has reached a point where there are supply problems especially in times of high demand.
- Some of the rural water supply pipes are having high failure rates. Over such a large area, such failures and leaks can be very difficult to detect and it is expensive to do so.
- Lack of capacity, therefore no new connections are allowed to the scheme.

The strategic approaches to these issues are to.

- Undertake an affordability check to confirm whether the treatment upgrade at O'Connor Creek and Golden Hills is feasible.
- If part of the supply area is transferred on to the 'Coastal Pipeline' scheme, these properties will be limited to 1.5m^3/day.

Table B-26: Register of Assets for Redwood Valley Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Redwoods Valley	Golden Hills well Water Permit = 200m^3/day O'Connor Creek wells Water Permit = 350m^3/day River Road well Water Permit = 600m^3/day	<u>River Road well</u> Lowara Z630/6 7.5kW <u>O'Connor Creek wells</u> Well 1 – Grundfos SP25-2 1.5kW Well 2 – Grundfos SP25-2 1.5kW <u>O'Connor Creek PS</u> 2 x Lowara SV30-09 1.5kW <u>Golden Hills PS</u> Pump 1 – Lowara DE4 (cora7-24/5) 7.5kW Pump 2 – Grundfos SP14A-5/4 1.5kW Highlift Pump 1 –Lowara SV1615F150 15kW Highlift Pump 2 – Grundfos CR16-140 15kW <u>Redwood Booster PS 1</u> 1 x Lowara SV4-20 F40T 4kW 1 x Lowara SV220 3kW <u>Redwood Booster PS 2 – Maiseys Road</u> 2 x Lowara SV212 1.5kW	Aeration for pH adjustment Gas Chlorination pH Measurement Chlorine Measurement Turbidity Measurement	Maisey Road Reservoirs 138m^3 Redwood H.L. Reservoir 23m^3 Redwood No1 Reservoir 36m^3 Redwood, Malling Road BP Tank 37m^3 Moutere Highway Reservoir 23m^3	Water Mains	15mm 20mm 25mm 32mm 40mm 50mm 65mm 80mm 100mm **Total**	256m 34,282m 16,797m 7,318m 10,375m 10,209m 689m 13,712m 4,062m **97,702m**	Valves 87 Restrictors 363

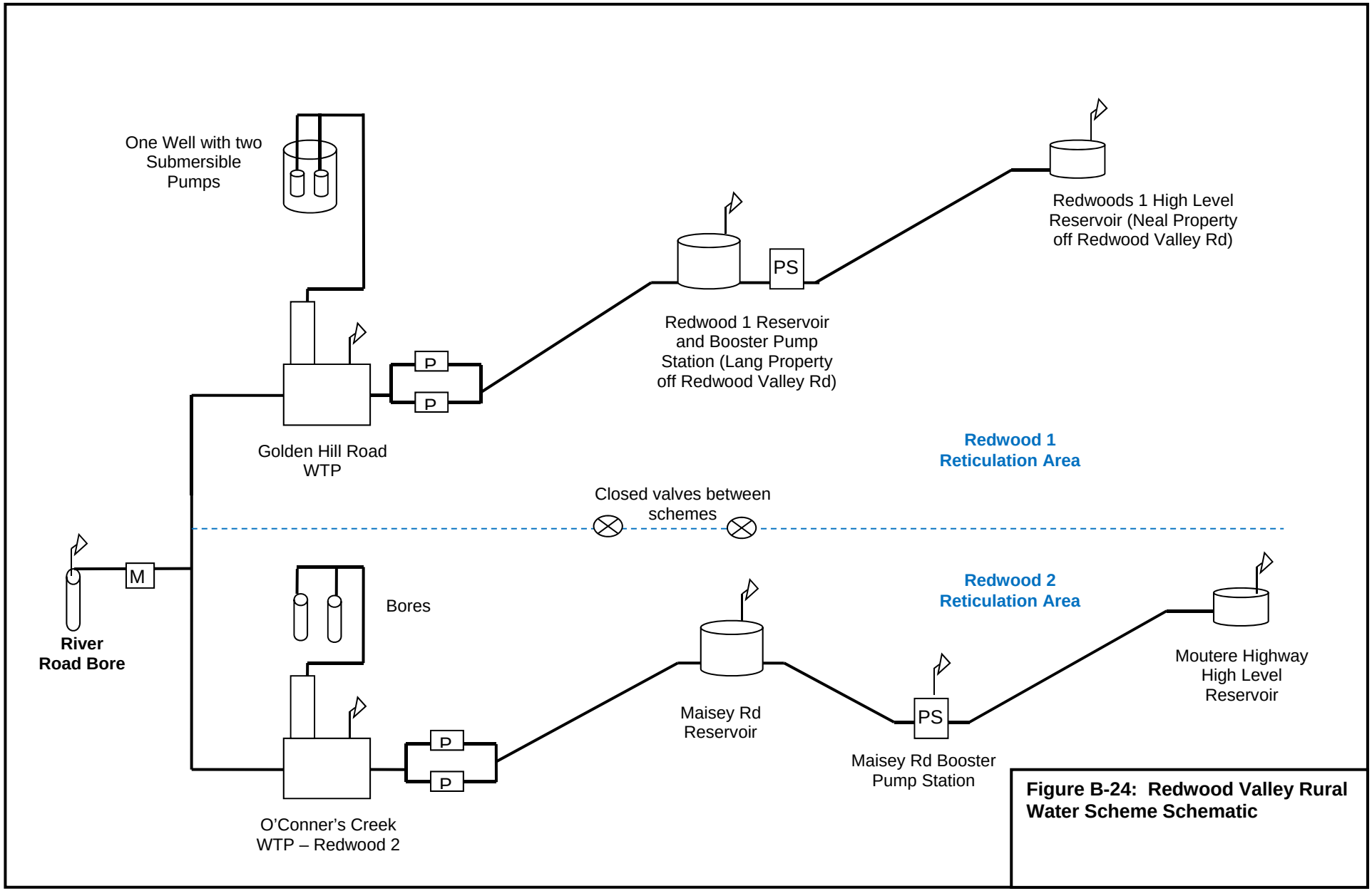


Figure B-24: Redwood Valley Rural Water Scheme Schematic

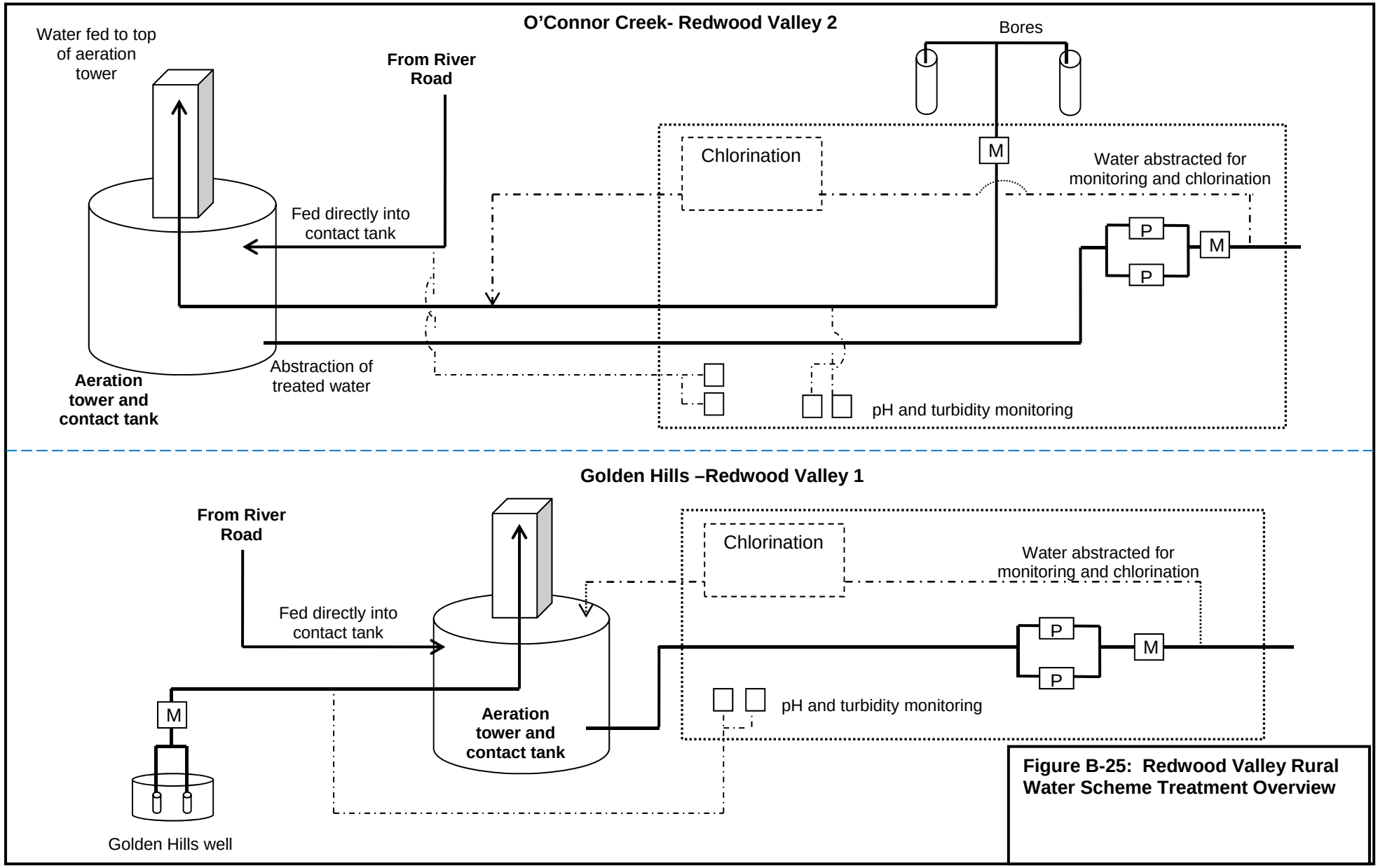


Figure B-25: Redwood Valley Rural Water Scheme Treatment Overview

B.4 Community Water Schemes

B.4.1. Motueka Water Supply

B.4.1.1 System Description

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

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

The water is sourced from:

- a bore at the Fearon's Bush Motor Camp in Fearon Street
- a bore at the Recreation Centre in Old Wharf Road.

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

Motueka and Riwaka have approximately 50 fire wells and 70 fire pipes that have to be maintained for fire fighting purposes in areas where there is no reticulation.

A connection exists between the Tasman District Council main in Everett Street and Talley's supply from their well in High Street South. The link is installed with two shut valves, an RPZ backflow device and a meter. This connection enables flows to be supplied either way for emergencies only.

There are 907 metered connections (June 2011) and no restricted rural connections. The estimated population of Motueka is approximately 2,200 people.

B.4.1.2 System Operation Overview

The scheme comprises:

- two separate bores
- bore pumps
- an old contact tank at Fearon's Bush
- high lift pumps
- back-up generators at each bore site.

At Fearon's Bush there are two options for supply. One option is for the bore pump to pump water into an old contact tank from which high lift pumps extract the water and pump it into the reticulation. The other option is for the bore pump to bypass the tank and pump directly to the back of the high lifts, which then boost the flow into the reticulation. There are three high lift pumps: two large ones for normal daily operation and one small one which is on a timer and only comes on at night. This night pump is quieter and can maintain the smaller flow required at night more easily.

At the Recreation Centre there is one bore pump which supplies water directly from the bore into the reticulation.

During usual operation, the Fearon's Bush well operates during periods of normal demand, however when pressure drops below a set point the Recreation Centre well (which has a much larger capacity) switches on. This latter pump is variable speed and adjusts flow to suit demand. The system can also be run the opposite way round, with the Recreation Centre bore providing the primary flow and Fearon's Bush providing only emergency flows in the event of a pump failure or pipe breakage. The scheme was operated in this manner for most of 2011.

Standby generators are installed at both Fearon's Bush and the Recreation Centre to ensure constant supply in the event of a power outage (as there is no water storage).

A schematic drawing is included at the end of this section.

B.4.1.3 Key Lifelines

The Nelson Tasman Engineering Lifelines report 2008, confirms there are no section of the network that have been identified from vulnerability assessment as critical.

B.4.2. B.3.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is not in place for Motueka.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been nine bacteriological non-compliance events in Motueka in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Motueka has an approved PHRMP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Motueka has a hydraulic model.

B.4.2.1 Asset Condition Overview

The majority of pipeline in the Motueka supply is of poor quality with frequent mains failures. Some of the reticulation is Class B uPVC and is approximately 20 years old. There have been several problems relating to pipe breakages which are believed to be caused by low grade (Class B) pipe and the high surge pressures. This can arise when water is pumped into a closed system with no break pressure such as a tank or reservoir.

The Class B pipe is a limiting factor within the system. Areas suffering regular problems include High Street South, Fearon Street, Old Wharf Road, Thorpe Street and Central High Street.

There are issues with the water quality at the Fearon's Bush supply which started in October 2010. The supply was suspended and tests were continued to monitor the bacteria levels. The levels have continued to fluctuate and have not reached acceptable levels therefore it is unlikely it will be reconnected to the system without the development of a treatment plant.

B.4.2.2 Water Quality and DWSNZ Compliance

Required sampling - Motueka supplies approximately 2,200 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The groundwater around Motueka is plentiful and of high quality. The shallow unconfined aquifers would not be defined as "secure" sources and therefore, require treatment to meet DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli*. The compliance criteria that are currently used are 'Criteria 1' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- at the plants, 26 samples per quarter with a maximum of five days between samples and six different days of the week used
- in the zone (two sample locations) 13 samples per quarter with a maximum of 11 days between samples and five different days of the week used.

The treatment plants have online turbidity and pH analysers.

Historical results - Between July 2006 and June 2011, 539 samples were taken from the zone. 11 of these were transgressions (eight separate occasions).

Two hundred and seventy two samples were taken from Fearon's Bush with no transgressions. Four hundred and thirty one samples were taken from the Recreation Centre with three transgressions recorded (one event).

B.4.2.3 Resource Consents

There are two resource consents in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Motueka	GW	Recreation Centre bore	NN000254	23/06/2000	31/05/2015
		Fearon's Bush bore.	NN000256	10/07/2000	31/05/2015

B.4.2.4 Current and Future Demands

According to the most recent data available, there are 907 metered connections (30 June 2011). This equates to an estimated connected population of 2,200 on the Motueka scheme. The daily water use is shown in Table B-27 below

Table B-27: Current Demand of the Motueka Water Supply

Source	Water Permit (m^3/d)	Average Summer Demand (m^3/d)[1]	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)[2]	Maximum Daily Demand (m^3/d)[1]
Recreation Centre	3,500	222	26	125	460
Fearon's Bush	1,000	535	503	520	868
Total	**4,500**	**756**	**529**	**646**	**950**[3]

[1] Fearon's Bush supply was suspended from the start of October 2010 due to water quality issues, therefore normal summer data and maximum demand calculated from 2009/2010 summer
[2] Calculated Oct 2009 to Oct 2010
[3] Maximum demand at both sites does not occur on the same day. The total maximum usage is about 950m^3/day

The current Motueka water supply has limited ability to provide growth of the scheme. It does not have the capacity to serve the entire Motueka town.

It is anticipated that in 2033 the demand in Motueka, rural Motueka and Riwaka is as follows:

- average day demand – 3,937m^3/day
- peak day demand – 9,216m^3/day.

Tasman District Council are proposing a new Motueka scheme that will support the future demand in this area. This scheme will include a new source and a new treatment system.

B.4.2.5 Strategic Studies

Various strategic studies have been undertaken to date for the Motueka water supply system. These can provide reference and background information for developing the strategic approaches to be taken in the future.

- Motueka Town Water Supply Coastal Scheme Public Health Risk Management Plan - August 2009.
- Water Demand Management Plan for the Tasman District – September 2011.
- Motueka Coastal Community Water Supply Demand Projection – August 2011.

B.4.2.6 Strategic Approach

The key issues facing Motueka are:

- the town has a partial reticulation system which serves only 25% of the town
- there is no storage capacity in the current system
- the partial reticulation and fire wells provide limited fire fighting capability
- the current supply does not comply with DWSNZ
- medium population growth in the future.

The strategic approach to address these issues is:

- if Tasman District Council receives a subsidy and with consultation with the community a new source, treatment plan and network will be constructed to supply a larger area of the town
- if Tasman District Council does not receive a subsidy, consultation with the community is needed for developing a way forward to ensure compliance with DWSNZ is achieved.

Table B-28: Register of Assets for Motueka Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Motueka	Bore – Fearon's Bush Motor Camp Water Permit = 1000m^3/day Bore – Recreation Centre, Old Wharf Road Water Permit = 3,500m^3/day	<u>Fearon's Bush PS</u> HLPump 1 Grundfos CR 16-50 5.5kw with Hydrovar VSD HL Pump 2 Lowara FHE40 15kw with Hydrovar VSD HL Pump 3 Lowara FHE40 15kw with Hydrovar VSD <u>Fearon's Bush well</u> Well Pump Goulds 7 TNHC 7.5 kw. <u>Recreation Centre well (Old Wharf Road)</u> Well Pump - Goulds 8N/120-4 40hp	No Treatment		Water Mains	12mm 15mm 20mm 25mm 32mm 40mm 50mm 80mm 100mm 150mm 155mm 200mm 225mm 300mm **Total**	12m 1,346m 751m 1,650m 219m 1,313m 10,935m 429m 2,779m 6,352m 534m 8,934m 570m 159m **35,983m**	Fire Hydrants Meter Valves	153 1066 312

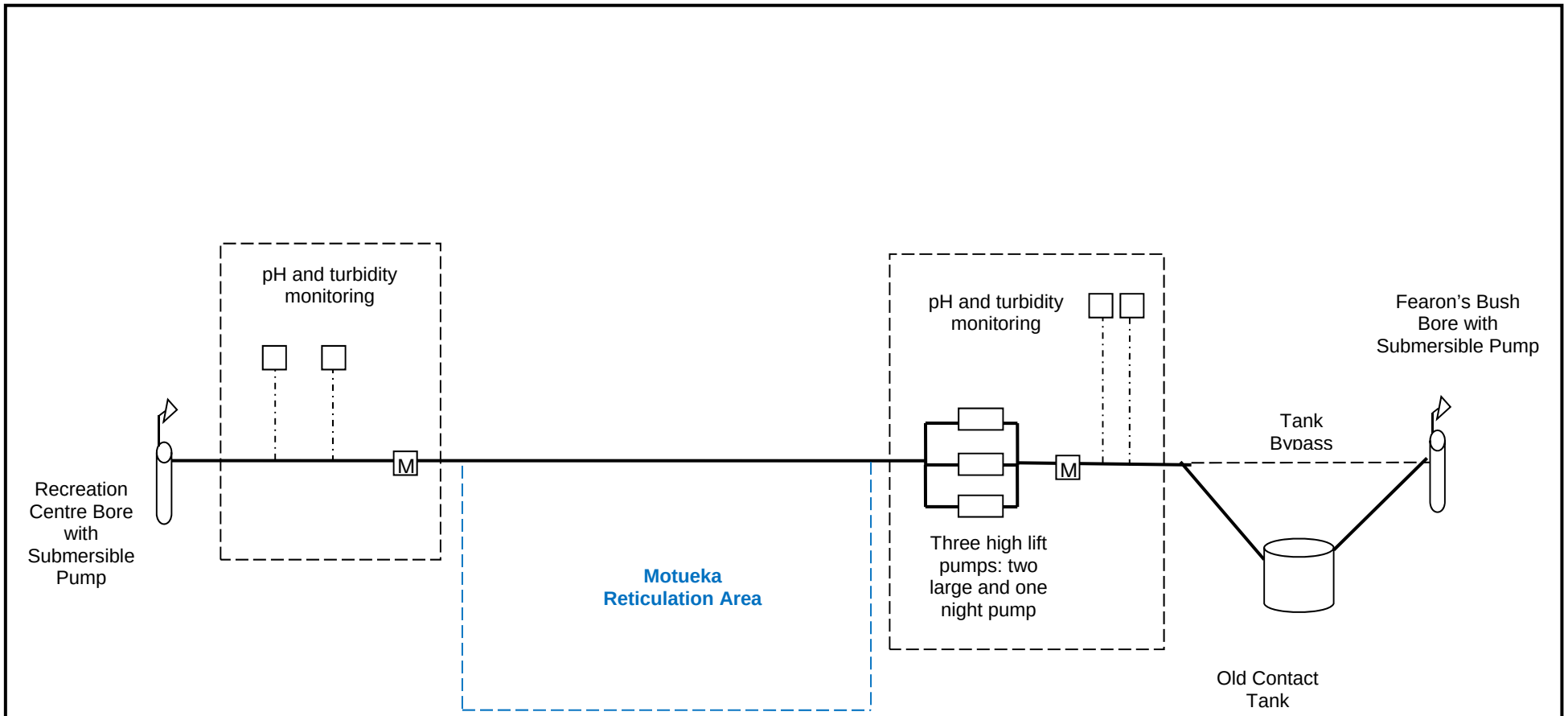


Figure B-26: Motueka Community Water Scheme Schematic and Monitoring Detail

B.4.3. Pohara Valley Water Supply

B.4.3.1 System Description

As of the 1 July 2012, the Pohara Valley water supply will be part of the Urban Water Supply group.

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

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

There are 49 metered connections (June 2011) and no restricted rural extension connections. The estimated population of Pohara is approximately 120 people, however as many houses in the area (possibly about 70%) are holiday homes/baches, the permanent population will be much less. The camping ground swells the population numbers using the scheme significantly in summer to over a thousand people.

Several kilometers of dry pipe have been laid in recent years to both the west and east of the current supply area in preparation for anticipated growth.

B.4.3.2 System Operation Overview

The scheme comprises:

- stream intake
- disc filter and multimedia filtration
- in line chlorination and contact tank
- high lift pump
- reservoirs (two 22m^3 plastic tanks and one 38m^3 concrete tank). Only the concrete tank is currently in general operation.

Most of the Pohara Valley reticulation is 100mm PVC mains with some hydrants. An 80mm galvanised pipe supplies water from the intake to the treatment plant with an 80mm motorised valve installed on the inlet, controlled by the level of the contact tank.

The high lift pump draws its water from the contact tank and supplies into the reticulation and on to the reservoirs. The high lift pump is controlled by the reservoir level via a control cable from the reservoir to the treatment plant.

Water quality in the scheme is generally poor. The raw water can become discoloured with high turbidity particularly during high stream flows. The current filtration is not fine enough to remove the very fine sediment that gets washed from the catchment during rain.

The small reservoir size means that during peak demand the filter is sometimes bypassed to increase the flow into the system. The reservoir filling system needs to be upgraded so that the full volume of the reservoirs can be better utilised. Currently, due to the elevation of the plastic reservoirs being much lower than the concrete reservoir, the two plastic reservoirs are not in use. This is because the extra height in the concrete reservoir is needed to supply an acceptable pressure to neighbouring properties.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.4.3.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.4.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Pohara.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one bacteriological non-compliance in Pohara in the last five years.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply:

- Pohara does not have an approved PHRMP.

LoS 13 – Hydraulic models are in place for key urban water supplies:

- Pohara does not have a hydraulic model.

B.4.3.5 Asset Condition Overview

The condition of the pipework in the system is varies. Some was installed during subdivisions in the 1990, but a large part of the system is older and of poorer quality. There are not many breaks reported however, this is probably due to the low operating pressure of the system.

The intake pipeline is very poor quality and requires replacing.

B.4.3.6 Water Quality and DWSNZ Compliance

Required sampling – Pohara Valley supplies approximately 120 people making it a 'small' supply (100 to 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2A' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone, a maximum of 45 days apart and at least two days of the week used
- seven samples per quarter in the zone, a maximum of 22 days apart and at least three days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

Monitoring is increased during the peak summer period to comply with the increase in population. The treatment plant has no online analysers and is not connected to telemetry.

Historical results - Between July 2006 and June 2011, 100 samples were taken from the zone with one transgression. One hundred and twenty samples were taken from the plant with no transgressions.

B.4.3.7 Resource Consents

There is a resource consent in place for the abstraction of surface water:

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Pohara	SW	Winter Creek (flows into Golden Bay).	NN720010	30/04/1996	01/10/2026

B.4.3.8 Current and Future Demands

According to the most recent data available there are 49 metered connections. One of these connections is to the Pohara Camp. The camp connection experiences extremely high usage in the summer months from an influx of tourists to the area. The population estimate of approximately 120 people is closer to being accurate for the off peak times. The population and supply demand increases over the summer months.

Whilst the maximum day demand is not close to the consent limit, it is close to the scheme capacity, which is constrained by the reservoir capacity and the filtration unit capacity. The daily water use is shown in Table B-30 below.

Table B-29: Current Demand of Pohara Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
550	203	169	192	282

Until a new town supply is constructed either at Pohara or extended from Takaka, no new connections will be permitted onto the existing Pohara water supply system.

B.4.3.9 Strategic Studies

The key strategic studies within this water supply area are:

- Water Demand Management Plan for the Tasman District – September 2011.

B.4.3.10 Strategic Approach

The key issues facing the Pohara scheme are.

- The scheme has a surface water source of poor quality and the limited treatment it receives does not meet DWSNZ.
- Not enough storage. The scheme struggles to meet demand during the summer.
- There is a large unmet water demand along the whole coast from Pohara Valley to Tata Beach. The existing source cannot meet this demand.
- Takaka has no public water supply but plentiful quality groundwater that could sustain a water scheme that services Takaka and the Pohara to Tata Beach demand.

The strategic approach to these issues is.

- Upgrade the treatment plant to meet DWSNZ standards (including better filtration and protozoa treatment).
- Increase the storage volume.
- Construct a new town supply from a groundwater source at Takaka. The new supply would feed Pohara and all coastal communities from Pohara Valley to Tata Beach.
- If the new town supply goes ahead, the existing WTP will become redundant. The timing of the new town supply dictates the necessity of upgrading the existing WTP.
- Implement a ‘boil water notice’.

Table B-30: Register of Assets for Pohara Water Supply Scheme

Scheme	Source	Pumps and Pump Station	Water Treatment	Storage	Reticulation			Other Assets	
Pohara	Stream Intake = 550 m^3/day	Pohara Valley pump station Lowara FHE 32 200/40 4kW	Coarse Screen Multi Media Filtration Gas Chlorination	Pohara Reservoir 2 x 22m^3 1 x 38m^3	Water Mains	15mm 20mm 25mm 40mm 50mm 80mm 100mm 150mm **Total**	247m 131m 638m 167m 14m 200m 4,758m 275m **6,431m**	Fire Hydrants Meter Valves	16 49 21

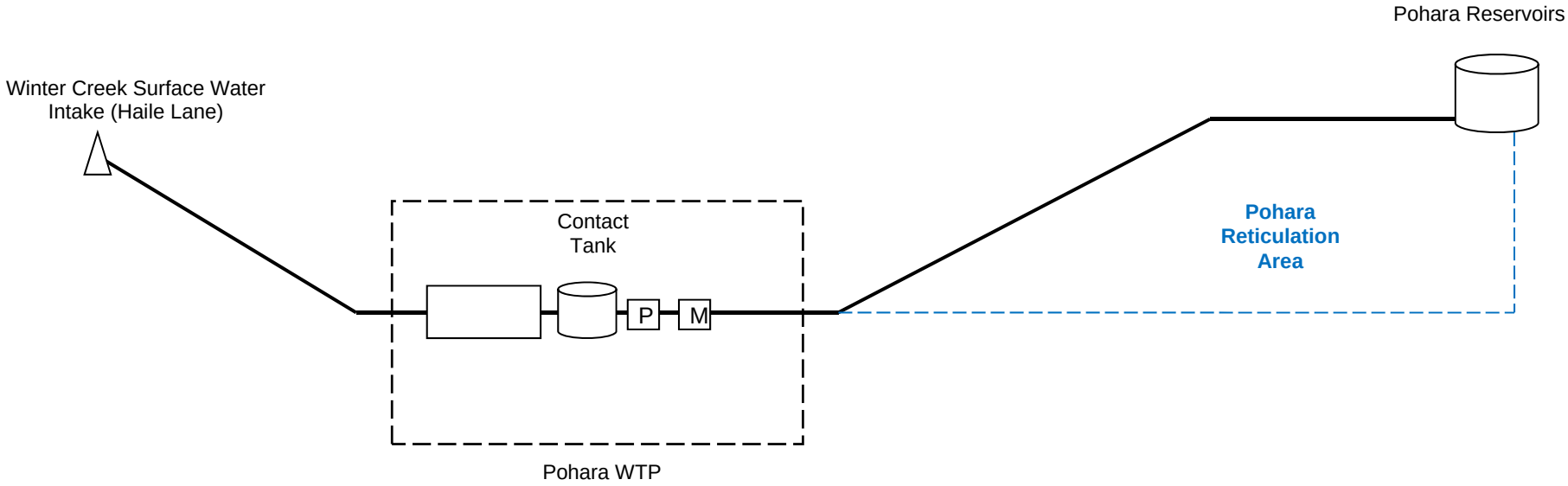


Figure B-27: Pohara Valley Community Water Scheme Schematic

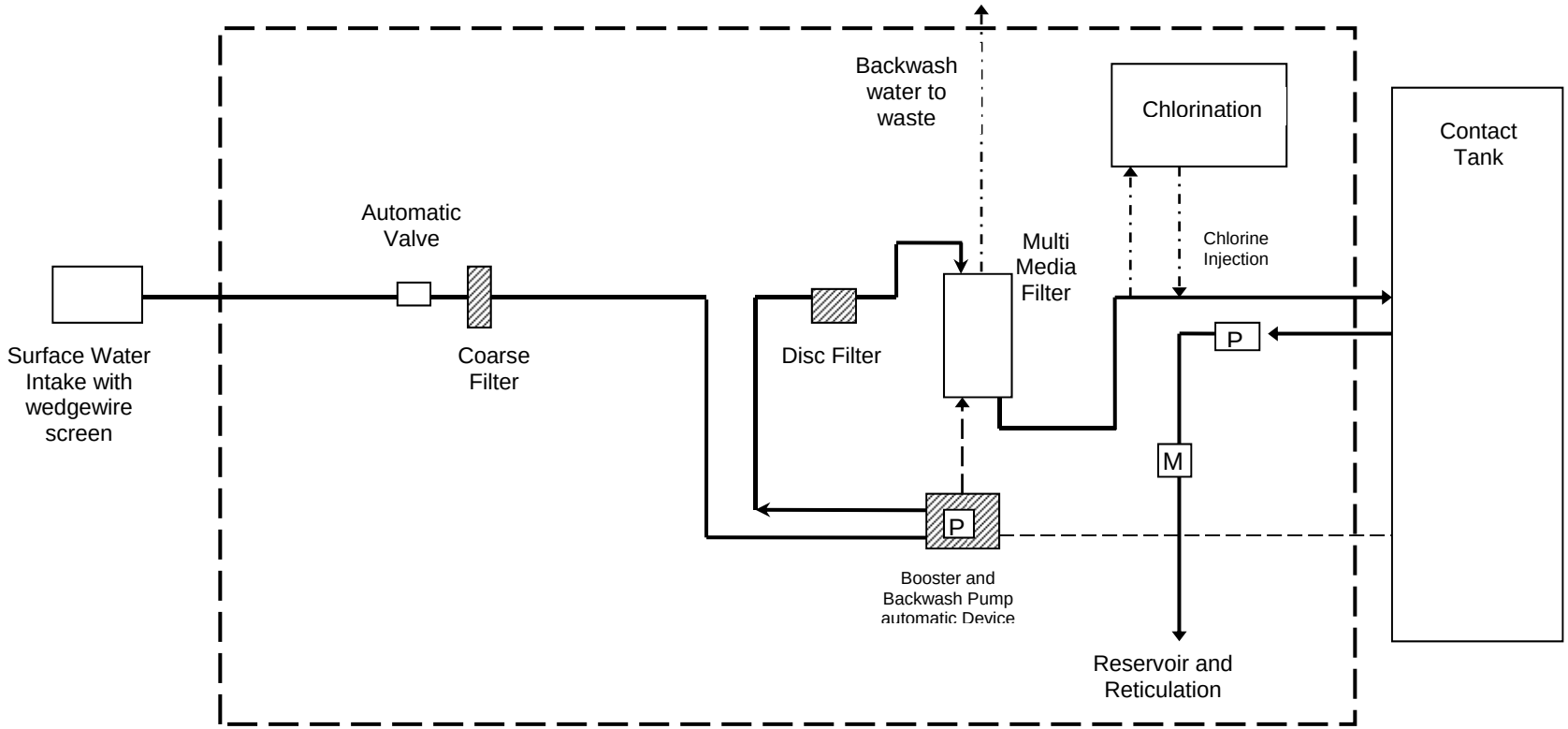


Figure B-28: Pohara Valley Community Water Scheme Treatment Detail

B.4.4. Hamama Water Supply

B.4.4.1 System Description

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

The stream catchment is an 80 hectare area of land owned by The Tasman District Council and designated as a water supply reserve area.

A user committee, under a Golden Bay County Council by-law operates the supply. The Council rate the supply area on land value to provide maintenance and operations funding for the management committee but have no direct involvement in maintaining the scheme.

The scheme was originally designed for 10 farms but demand has grown considerably with rural subdivision and now it is reported that the system operates at its maximum capacity in the dry periods during the milking season. There are currently 21 open connections registered in the Tasman District Council billing database, however the maintenance contractors database (May 2011) show 25 connections. When the road was re-laid in 2007 all of these connections were re-done, with new toby boxes and double check valves. The estimated population of Hamama is approximately 60 people.

B.4.4.2 System Operation Overview

The scheme comprises:

- stream intake
- settling tank
- reservoir
- reticulation with open connections.

The system is an unmetered, 'on demand' system with no restrictors. The mains at the top of Hamama Road are 100mm diameter concrete pipe reducing to 25mm diameter galvanised iron at the State Highway junction.

There is no schematic for the Hamama scheme currently available.

B.4.4.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from Vulnerability Assessment as critical.

B.4.4.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management is in place for Hamama.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- Testing is not undertaken at Hamama so this level of service is not met.

LoS 8 – PHRMPs are in place, approved and being implemented for each water supply.

- Hamama does not have an approved PHRMP.

LoS 11 – Hydraulic models are in place for key urban water supplies.

- Hamama does not have a hydraulic model.

B.4.4.5 Asset Condition Overview

The Hamama scheme is an on demand supply as there are no bulk flow meters on the scheme and no individual meters the use is unknown.

Approximately 3km of the old water main in Hamama Road (from Waingaro Road intersection, west to the last house on Hamama Road) were replaced a few years ago. The existing reservoir is in average to poor condition.

B.4.4.6 Water Quality and DWSNZ Compliance

Required sampling - Hamama supplies approximately 60 people making it a 'neighbourhood' supply (between 25 and 100 people) in terms of the DWSNZ.

There is also no treatment plant and the water quality is not tested for *E.coli* as per the DWSNZ requirements, or for any other parameters such as pH or turbidity.

B.4.4.7 Resource Consents

There is a resource consent in place for the use/take of surface water. This resource consent has been granted to the Hamama Water Supply Committee rather than Tasman District Council.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Hamama	SW	Tributary of Waingaro River.	RM031060	10/05/2004	31/05/2019

B.4.4.8 Current and Future Demands

According to the most recent data available, there are 25 open connections (May 2011). No further data is available. No future growth is expected for Hamama. The daily water use is shown in Table B-31 below.

Table B-31: Current Demand of Hamama Water Supply

Water Availability (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
500	Unknown	Unknown	Unknown	Unknown

B.4.4.9 Strategic Studies

Limited studies have been undertaken to date for the Hamama water supply system. Further studies would be useful as these can provide reference and background information for developing the strategic approaches to take in the future.

- Public Health Risk Management Plan – due July 2013.

B.4.4.10 Strategic Approach

The key issues in Hamama are:

- it has a very limited funding base therefore it is difficult to fund improvements or upgrades.

- Even though the water is used largely for stock water there is domestic use as well and the supply requires water treatment to meet DWSNZ.

The strategic approach for Hamama is to:

- involve the scheme members as much as possible in the operation, maintenance and management.
- providing conventional water treatment would not be a cost effective solution for Hamama. One solution is to provide individual household treatment units. These have relatively low capital cost but the operational and maintenance costs may be reasonably high. Other options will be considered following approval of the PHRMP.

Table B-32: Register of Assets for Hamama Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Hamama	Stream intake = 500 m^3/day	No pump stations	No treatment		Water Mains	25mm	139m	Fire Hydrants	1
						32mm	558m	Connections	25
						40mm	1,612m	Valve	9
						50mm	1,701m		
						75mm	970m		
						100mm	5,227m		
						150mm	32m		
						225mm	6m		
						Total	**10,246m**		

APPENDIX C. ASSESSMENT OF WATER SUPPLIES IN THE DISTRICT

Tasman District Council performed the Water and Sanitary Services Assessments (WSSA) in 2005 and evaluated all Council owned, community and some private water supplies. The WSSA documents consist of two volumes:

Volume 1: Contained an overview of the water and sanitary services in Tasman district with recommendations and priority rankings for future improvements.

Volume 2: Contained the detailed assessments.

The WSSA documents were made available to the public for consultation purposes and a special meeting was held in June 2005 to review public submissions.

Council approved the WSSA documents in June 2005 and therefore met the requirements of the Local Government Act 2002 that the first assessment be adopted before 30 June 2005.

Recent changes to the Local Government Act 2002 now require Council to identify in the Long Term Plan any significant variation between the proposals in that plan and Council's assessment of water and sanitary services and its waste management and minimisation plan (clause 6 of Schedule 10 of the Act).

Sections 126 – 129 of the Local Government Act have been repealed. This means that while Council still need to undertake water and sanitary services assessments within the district, the process for undertaking the assessments and the extent of information required are no longer dictated.

An amendment to Section 125 of the Act now means that an assessment may be included in the Council's long-term plan, but, if it is not, Council must adopt the assessment using the special consultative procedure. The majority of information in the WSSA, in respect of Council owned and operated services, is now included in Appendix B of this Activity Management Plans. Council is under an obligation to assess privately owned services from time to time. There is no guidance to the timelines associated with these assessments; however, Council has made financial provision in this 10 year forecast to carry out assessments in 2015/2016.

Key variations since the adoption of the WSSA in 2005 are noted below:

- Council have decided that the Pohara water supply joins the Urban Water Club, which will increase the number of water supplies serving essentially urban areas from 10 to 11. Pohara was previously classed as a Community Supply, only Motueka and Hamama remain as Community Supplies in this AMP. The Rural water supplies remain unchanged.

- Council is progressing with the upgrade of water treatment for all urban water supplies to bring the, in line with the Drinking Water Standards (DWSNZ:2003, revised 2008) and will continue to undertake improvements to Council's systems as identified in this AMP.

- The WSSA identified and prioritised those communities which do not have a Council owned water supply. The priority ranking was determined based on general water availability and the quality of the water that is available.

- The community considered highest priority (Priority 1) is Motueka. Council has made provision in this AMP to construct a water supply for Motueka, commencing 2021. Council has made provisions for water supplies to the Priority 2 communities, but all are beyond the 10 years covered by the Long Term Plan.

APPENDIX D. ASSET VALUATIONS

D.1 Background

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

The Financial Reporting Act 1993 sets out a process by which GAAP is established for all reporting entities and groups, the Crown and all departments, Offices of Parliament and Crown entities and all local authorities. Compliance with the New Zealand Equivalent to International Accounting Standard 16; Property, Plant and Equipment (NZ IAS 16) and IAS 36 (Impairment of Assets) is the one of the current requirements of meeting GAAP.

The purpose of the valuations is for reporting asset values in the financial statements of Tasman District Council.

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

The valuations summarised below have been completed in accordance with the following standards and are suitable for inclusion in the financial statements for the year ending June 2009.

- NAMS Group Infrastructure Asset Valuation Guidelines – Edition 2.0.
- New Zealand Equivalent to International Accounting Standard 16; Property, Plant and Equipment (NZ IAS 16) and IAS 36 (Impairment of Assets).

D.1.1. Depreciation

Depreciation of assets must be charged over their useful life.

- *Depreciated Replacement Cost* is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity. The *Depreciated Replacement Cost* has been calculated as:

$$\frac{\text{Remaining useful life}}{\text{Total useful life}} \times \text{replacement cost}$$

- *Depreciation* is a measure of the consumption of the economic benefits embodied in an asset. It distributes the cost or value of an asset over its estimated useful life. Straight-line depreciation is used in this valuation.
- *Total Depreciation to Date* is the total amount of the asset's economic benefits consumed since the asset was constructed or installed.
- The *Annual Depreciation* is the amount the asset depreciates in a year. It is defined as the replacement cost minus the residual value divided by the estimated total useful life for the asset.
- The *Minimum Remaining Useful Life* is applied to assets which are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the standard useful life and used in the calculation of the depreciated replacement value.

D.1.2. Revaluation

The revaluations are based on accurate and substantially complete asset registers and appropriate replacement costs and effective lives.

(a) The lives are generally based upon NZ Infrastructure Asset Valuation and Depreciation Guidelines (NZIAVDG) – Edition 2. In specific cases these have been modified where in our, and Council's opinion a different life is appropriate. The changes are justified in the valuation report.

(b) The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

D.2 Overview of Asset Valuations

Assets were previously valued every three years, but Council has now moved to a two year revaluation cycle. Historic asset valuations reports are held with Council.

Council was due to revalue their assets as at end June 2011, however with the small number of changes made to the networks since the 2009 valuations, the decision was made to defer the valuation until the end of June 2012.

D.3 2009 Valuation - Water

The Water Supply assets were last re-valued in June 2009 and are reported under separate cover[2]. Key assumptions in assessing the asset valuations are described in detail in the valuation report.

D.3.1. Asset Data

The majority of information for valuing the assets was obtained from Council's Confirm database. This is the first time the database has been used to revalue Councils assets. In the past, asset registers based on excel spreadsheets have been used. The data confidence is detailed in Table D-1 below.

Table D-1: Data Confidence

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

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

D.3.2. Asset Lives

The *Base Useful Lives* for each asset type as published in the NZIAVDG Manual were used as a guideline for the lives of the assets in the valuation. Generally lives are taken as from the mid-range of the typical lives indicated in the Valuation Manual where no better information is available. Lives used in the valuation are presented in Table D-2 following.

[2] Infrastructural Asset Revaluation, June 2009 – MWH New Zealand Ltd report for Tasman District Council

Table D-2: Asset Lives

Item	Life (years)	Minimum Remaining Life (years)
Pipelines		
AC, Cu pipe, unknown pipe	60	5
Concrete pipe (stormwater)	120	5
Concrete pipe (wastewater)	80	5
EW pipe	60	5
PVC pipe	80	5
PE pipe	80	5
DI, CI Steel pipe	80	5
Miscellaneous pipeworks and fitting associated with Treatment plants and pump stations	50	5
Valves, hydrants	50	5
Manholes	80	5
Water meters, restrictors	15	2
Non Pipeline Civil Assets		
Borewells	60	5
Civil pump chambers	80	5
Civil concrete structures	80	5
Civil buildings (all materials)	50	5
Civil pipework and fittings	50	5
Soakpit	80	5
Reservoirs (all materials)	80	5
Tanks (concrete, plastic, fibreglass)	50	5
Landscaping/fencing	20	5
Mechanical Assets		
Small plant – pumps, blowers, chlorinating/UV equipment, aerators, screens	20	2
Electrical and Telemetry Assets		
Electrical/Controls	20	2
Telemetry/SCADA	20	2

D.3.3 2009 Valuation

The optimised replacement value, annual depreciation and optimised depreciated replacement value of the water assets are summarised in Table D-3, Table D-4 and Table D-5 shows the asset value by Water Supply Areas.

Table D-3: Water Asset Valuation Summary 30 June 2009

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Water Pipes	100,833,710	66,473,228	34,360,481	1,400,230
Water Surface features	27,771,676	16,613,347	11,158,330	695,640
Water Resource Consents	610,000	311,786	298,214	62,647
Total	**129,215,386**	**83,398,360**	**45,817,026**	**2,158,517**

Table D-4: 2007 / 2009 Water Valuation Comparison

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Water 2007	109,892,479	66,055,187	43,837,293	1,887,993
Water 2009	129,215,386	83,398,360	45,817,026	2,158,517
% Increase	17.58%	26.26%	4.52%	14.33%

Overall the water assets have increased in optimised replacement value by 17.58% since the 2007 valuations. The increase in the replacement values is due to the following reasons:

- inflation over the two year period (ie. % as calculated by the construction fluctuation adjustment)
- the addition of new assets to the utilities since 2007
- migration of data from asset registers contained in spreadsheets into the Confirm database and subsequent updating of the data resulting in the improved accuracy of the captured data.

Table D-5: 2009 Asset Valuation by Supply Area

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Brightwater/Hope	10,025,114	6,190,714	3,834,400	170,852
Collingwood	3,241,883	2,901,782	340,101	52,547
Dovedale	9,213,315	5,485,899	3,727,416	133,927
Eighty Eight Valley	3,294,764	2,238,932	1,055,833	47,803
Hamama Road	887,139	510,404	376,735	11,841
Kaiteriteri/Riwaka	5,304,379	4,370,894	933,485	87,139
Mapua/Ruby Bay	16,907,815	13,411,731	3,496,085	239,404
Motueka	9,822,599	7,416,573	2,406,027	165,237
Murchison	3,439,791	2,114,120	1,325,670	60,414
Pohara	1,523,394	1,193,739	329,655	24,203
Redwood Valley	5,395,189	3,492,974	1,902,215	82,993
Richmond	45,027,865	23,417,349	21,610,516	791,776
Tapawera	2,016,709	906,614	1,110,095	36,631
Upper Takaka	578,968	369,930	209,038	8,321
Wakefield	6,040,975	3,713,101	2,327,874	103,509
Wai-iti Dam	3,204,282	3,105,604	98,678	39,207
Not Applicable	281,277	235,517	45,760	3,530
Tasman District Non-UDA	2,399,927	2,010,698	389,228	36,536

APPENDIX E. MAINTENANCE AND OPERATING ISSUES

E.1 Maintenance Contract

The operation and maintenance of the water supply systems has been incorporated into a single performance based contract, C688. The current maintenance contractor is Downer, awarded in 2007. The initial contract duration was six years with up to an additional four years potential extension, provided the contractor meets the performance requirements of the contract and provided Council want to extend the contract. Some of the key aspects of this contract are:

- performance based
- emphasis on proactive maintenance
- programme management
- quality management
- detailed schedule of works
- measurement of performance
- team approach to problem solving.

The implementation of the routine proactive maintenance work is managed in the following ways.

1. The Contractor prepares an Annual Maintenance Programme that consists of a variety of programmes of all routine proactive maintenance and reporting deadlines.

2. The Engineer to the Contract (Council's consultant) in conjunction with the Council reviews the programme against the budgets and then negotiates with the Contractor to agree any deferrals or amendments.

3. The Contractor then implements the work according to the schedules.

There are two other areas of maintenance: "Non Routine Proactive Maintenance" and "Reactive Maintenance". Budgets for these have been set based on historical spending sums and projected future system maintenance requirements.

The Non Routine Proactive Maintenance covers maintenance such as, mains flushing and checks on mechanical equipment. These are programmed and carried out annually with a report submitted to the Engineer on completion.

The Reactive Maintenance covers all water supply reticulation repairs including source, treatment plants, pipes and pump stations

The maintenance contract also covers works related to new facilities. These new facilities are usually related to minor system improvements and extensions.

E.2 Maintenance Standards

All work is performed, and materials used, to comply with the latest edition of the following standards:

- this AMP
- Contract 688 – Water Utilities Operations and Maintenance
- Tasman District Council Engineering Standards and Policies 2008.

The maintenance and operation standards for all work activities are specified in the maintenance contract, with performance measures including response times. The Asset Manager may vary these depending on changes to the level of service or budgeting constraints.

E.2.1. Deferred Maintenance

Deferred maintenance is defined as follows:

- the shortfall in rehabilitation or refurbishment work required to maintain the service potential of the asset
- maintenance and renewal work that was not performed when it should have been, or when it was scheduled to be and which has therefore been put off or delayed for a future period.

The current budget levels are believed to be sufficient to provide the intended level of service and therefore no maintenance work has been deferred. This however is subject to the changes in levels of service and expectations of water customers.

E.2.2. Increase in Network Size through Development

When new developments such as subdivisions are constructed any new water supply assets constructed by the developer must be accepted as being built to Council standards. Once vested as Council assets they are included in the water supply network and routine maintenance is undertaken through the operations contract. The maintenance budgets have some allowance for network growth where applicable.

E.2.3. Database

Customer Service Requests (CSR) and Work Orders (WO) are sent to the contractor via the Confirm database.

Local Operators receive WOs via laptops and mobile handheld devices. WOs are loaded against individual assets (where possible) and processed for payment with the monthly progress claim. All CSRs and WOs are time stamped depending on the contract timeframe. Response times and resolution times are monitored with Contractor performance as part of their monthly claim.

E.3 Engineering Studies

A number of studies have been allocated to the Operations and Maintenance Budget. These are summarised in Table E-1.

Table E-1: Summary of Engineering Studies included in this AMP

Study Name	Brief Description of Study
Water and Sanitary Services Assessment	The Water and Sanitary Services Assessment, is a council/community review of how the Council provide water, wastewater, stormwater, solid waste (refuse), public toilets and cemeteries and explores options for doing them more sustainably. This assessment is completed periodically.
Modelling of Reticulation Networks	Assessing capacity and deficiencies of reticulation networks, including Motueka, Richmond/Waimea, Mapua, Brightwater and Wakefield.
Public Health Risk Management Plan (PHRMP)	Production of Public Health Risk Management Plans for all water supply systems. This is a requirement of the Health (Drinking Water) Amendment Act.
Implementation of PHRMP	Implementing PHRMP improvements at each water treatment site.
Cryptosporidium Monitoring at Waimea Supply	Monitoring to confirm the treatment requirements for the Waimea source.
Radiological Testing on all Groundwater Supplies	Radiological testing is a requirement in the DWSNZ: 2005 (Revised 2008).
Further Demand Analysis	Further analyses historical water demands in each water supply system and identifies trends and patterns in water use. Assess water supply issues for each system.
Night Flow Monitoring	Develop a night flow monitoring programme to estimate and monitor the level of leakage in each scheme.
Water Demand Management Plans	Develop water demand management plans for the remaining schemes.
Water Demand Initiatives	This work involves producing an education programme for the general public, targeting schools, including promotion of water efficient fixtures and appliances. Water audits for high use non-residential properties.
Pressure Management	Identify through hydraulic modelling the areas within the networks that have the highest potential for pressure management.
Leak Detection Programme	Develop a leak detection programme, this will link in with night flow monitoring.
Fire Hydrant Audit	Auditing fire hydrants across the district to confirm they are operational.
Meter Replacement Programme	Developing a water meter replacement programme.
Water System Operation Plans	Developing and maintaining system operation plans for each network. These plans provide guidance for operation and maintenance, contingencies during an emergency and Health and Safety.
Inspection of Significant Assets	Key reservoir sites across the district are to be reviewed to confirm the condition of these assets.
Inspection of all Water Retaining Structures	Inspecting all water retaining structures throughout the district, including rural schemes.
Easement on Rural Water Schemes	Ensuring easements are in places for Council assets within the rural schemes.
Water Supply Bylaw Review	In accordance with the Local Government Act 2002, this bylaw will need to be reviewed no later than 10 years after Council last reviewed it.

Study Name	Brief Description of Study
Intake Flow Meter Programme	Installation of flow meters on all water source intakes. This is part of the new metering requirements.
Wai-iti Dam Surveys and Safety Reviews	The safety reviews involve a comprehensive review every five years and a general safety review every year (there is no general safety review when the comprehensive review is undertaken). Annual inspections and reporting is undertaken every year as is a deformation survey.
WINZ Data Management	Requirement of the DWSNZ to operate the WINZ database. This database allows for scheduling sampling and storing data.
Water Supply Annual Survey	Request from the Ministry of Health for Council to undertake the annual review of each water supply scheme.

E.4 2012 – 2032 Water Supply Operations and Maintenance Forecast

Twenty year forecasts for operations and maintenance costs are shown in Figure E-1, Table E-2 and Table E-2.

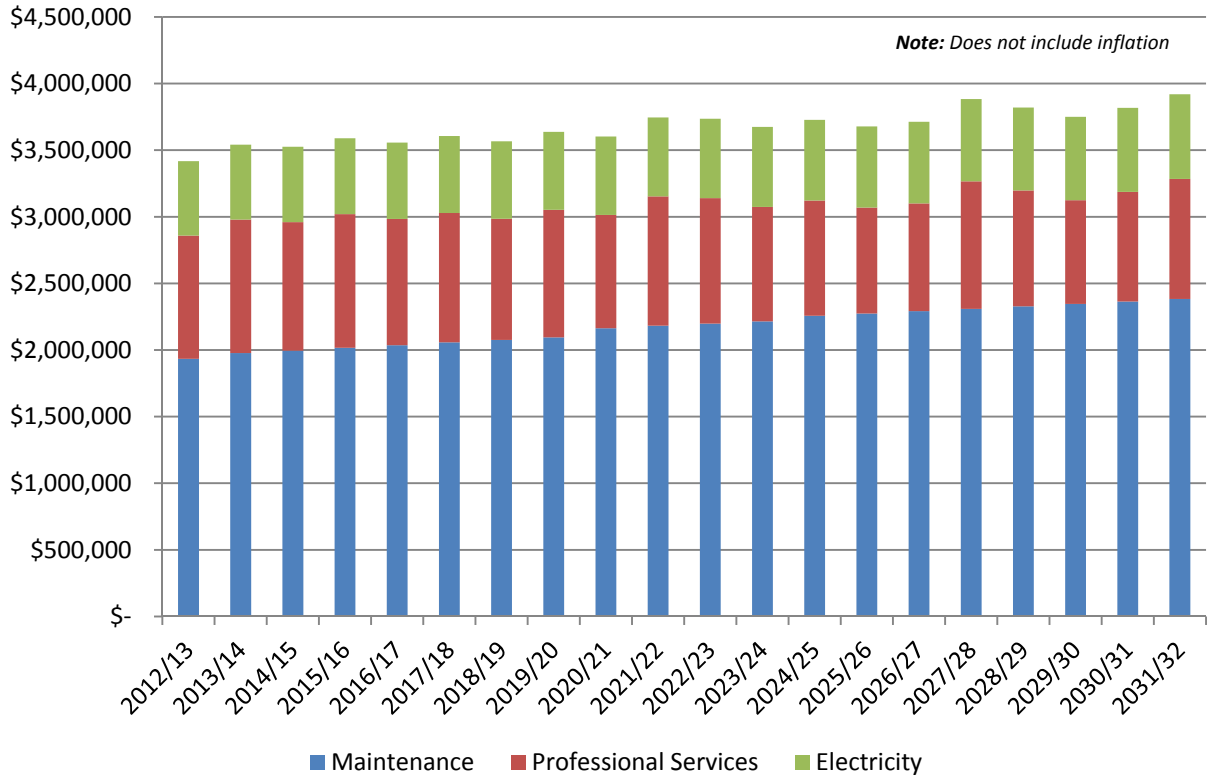


Figure E-1: 2012 – 2032 Water Supply Operations and Maintenance Forecast

Table E-2: 2012 – 2032 Water Supply Engineering Strategic Studies

Item	Study Name	Description	TOTAL	2012 / 2013	2013 / 2014	2014 / 2015	2015 / 2016	2016 / 2017	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022	2022 / 2023	2023 / 2024	2024 / 2025	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
1	Water Services Assessments	3 yearly reviews	120,000				40,000						40,000						40,000				
2	AMP Upgrades	3 yearly reviews	600,000		40,000	60,000		40,000	60,000		40,000	60,000		40,000	60,000		40,000	60,000		40,000	60,000		
4	AMP Improvement Plan Activities	Annual allowance	420,000	10,000	50,000	-	10,000	50,000		10,000	50,000	-	10,000	50,000	-	10,000	50,000	-	10,000	50,000	-	10,000	50,000
5	O&M Contract Tender		320,000	20,000			100,000						100,000						100,000				
6	Valuations	3 yearly reviews	140,000	20,000			20,000			20,000			20,000			20,000			20,000			20,000	
9	Water Modelling - Motueka		120,000	30,000					30000					30000					30000				
11	Water Modelling - Richmond/Waimea Recalibration		200,000					50000						50000				50000					50,000
12	Water Modelling - Mapua Recalibration		100,000	25,000					25000					25000					25000				
13	Water Modelling - Wakefield Recalibration		100,000			25,000				25000					25000					25000			
14	Water Modelling - Brightwater Recalibration		100,000			25,000				25000					25000					25000			
16	Model maintenance/updating		200,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
18	Future Demand analysis		120,000		30,000						30,000					30,000						30,000	
19	Night flow monitoring	5 largest urban schemes	210,000	15,000	15,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
22	Develop water demand management plan		200,000				20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000							
23	Develop meter replacement program		25,000									25,000											
24	Pressure management	Richmond/ Waimea	30,000			30,000																	
26	PHRMP	Brightwater	60,000	5,000			5,000			20,000		5,000		5,000		5,000		5,000		5,000		5,000	
27	PHRMP	Wakefield	65,000	5,000		5,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000	
28	PHRMP	Murchison	65,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000
29	PHRMP	Pohara Valley	65,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000
30	PHRMP	88 Valley	60,000			5,000			20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000
31	PHRMP	Dovedale	65,000			5,000	5,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000
32	PHRMP	Hamama	60,000			5,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000	
33	PHRMP	Collingwood	60,000			5,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000	
34	PHRMP	Redwoods, two sites	72,500		7,500		7,500			25,000			7,500		5,000		5,000		5,000		5,000		5,000
35	PHRMP	Richmond	85,000			40,000	5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000
36	PHRMP	Kaiteriteri	65,000	5,000		5,000		20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000	
37	PHRMP	Mapua	60,000				20,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000		5,000
42	Resource Consent Monitoring		640,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
43	Water System Operating Plans	SOP for Motueka	29,000	20,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000										
44	Water System Operating Plans	SOPs for 15 Water Supplies.	390,000	60,000	80,000	80,000	80,000	15,000	15,000	15,000	15,000	15,000	15,000										
45	Inspection of Significant Assets	Inspecting Wakefield, Richmond and Brightwater Reservoirs. Including Diving Inspections.	120,000	30,000						30,000					30,000							30,000	
46	Inspection of all water retaining structures	Inspecting all water retaining structures throughout the district.	200,000		50,000						50,000					50,000							50,000
47	Radiological testing of all groundwater supplies.		60,000	20,000										20,000								20,000	
48	Easement on rural water schemes.		100,000		20,000		20,000		20,000		20,000		20,000										

Item	Study Name	Description	TOTAL	2012 / 2013	2013 / 2014	2014 / 2015	2015 / 2016	2016 / 2017	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022	2022 / 2023	2023 / 2024	2024 / 2025	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
49	Cryptosporidium monitoring at Waimea Supply.		125,000		25,000				25,000							25,000				25,000			25,000
51	Implementation of PHRMPs.		380,000	20,000	20,000	20,000	20,000	50,000	50,000	50,000	50,000	50,000	50,000										
52	Fire Hydrant Audit.	Confirming operation of Fire Hydrants and checks to ensure the Fire Fighting Standards are being achieved.	300,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
54	Bylaw Review.	Review on current Bylaws.	36,000			18,000										18,000							
56	Leakage Detection Programme.	Leakage detection programme for all schemes.	410,000	25,000	25,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
57	Intake Flow Meter Programme.	To meet RMA (Water Metering) regulations.	30,000	15,000	15,000																		
58	Water Supply Annual Survey.		200,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
59	WINZ Data Management.		300,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
60	Wai-iti Dam - Comprehensive Safety Review.		120,000	30,000					30,000					30,000					30,000				
61	Wai-iti Dam Safety Reviews.		160,000		10,000	10,000	10,000	10,000		10,000	10,000	10,000	10,000		10,000	10,000	10,000	10,000		10,000	10,000	10,000	10000
62	Wai-iti Dam - Annual Inspection and Reporting.		200,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
63	Water Demand Initiatives.	Education Programmes and Audits.	360,000			20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
64	Wai-iti Dam - Deformation Surveys.		50,000	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2500
Total			**7,997,500**	**449,500**	**523,000**	**483,500**	**518,000**	**460,500**	**480,500**	**415,500**	**460,500**	**350,500**	**468,000**	**434,500**	**349,500**	**352,500**	**279,500**	**289,500**	**434,500**	**344,500**	**249,500**	**289,500**	**364,500**

Note: Does not include inflation

Table E-3: 2012 – 2032 Water Supply Operation and Maintenance Forecast

General Ledger Code		WATER GENERAL OPERATING & MAINTENANCE	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Water Supply																							
Urban Water Supply																							
0801 2401	Richmond	WAT RICHMOND MAINTENANCE	3,047,741	139,204	139,834	140,465	141,673	142,881	144,089	145,298	146,506	147,714	149,001	151,110	153,249	155,418	157,618	159,849	162,112	164,406	166,733	169,094	171,487
0801 2401 01	Kaiteriteri	WAT KAITERI MAINTENANCE	786,677	36,960	36,960	38,460	38,591	38,656	38,852	38,917	39,048	39,113	39,309	39,466	39,623	39,781	39,939	40,099	40,259	40,419	40,580	40,742	40,904
0801 2401 02	Brightwater/Hope	WAT BGW/HOPE MAINTENANCE	1,739,152	75,679	76,435	77,114	81,096	82,037	82,978	83,920	84,861	85,802	86,508	87,520	88,543	89,579	90,626	91,686	92,758	93,843	94,941	96,051	97,175
0801 2401 03	Wakefield	WAT WAKEFIELD MAINTENANCE	799,492	37,109	37,258	37,408	37,706	37,955	38,253	38,502	38,751	39,000	39,198	39,661	40,129	40,603	41,082	41,567	42,057	42,554	43,056	43,564	44,078
0801 2401 05	Tapawera	WAT TAPAWERA MAINTENANCE	718,972	34,859	35,067	35,276	35,276	35,276	35,276	35,276	35,276	35,276	35,276	35,527	35,779	36,033	36,289	36,547	36,806	37,067	37,331	37,596	37,863
0801 2401 06	Murchison	WAT MURCHSION MAINTENANCE	1,096,500	51,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975	54,975
0801 2401 07	Upper Takaka	WAT UPPER TAKAKA MAINTENANCE	346,500	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325	17,325
0801 2401 08	Waimea	WAT WAIMEA MAINTENANCE	3,122,185	106,896	133,842	137,432	141,534	145,636	149,739	153,841	157,944	162,046	166,661	166,661	166,661	166,661	166,661	166,661	166,661	166,661	166,661	166,661	166,661
0801 2401 09	Mapua Ruby Bay	WAT MAPUA MAINTENANCE	3,074,763	134,187	135,720	137,082	139,296	141,339	143,553	145,597	147,810	150,024	151,897	154,145	156,426	158,741	161,090	163,474	165,893	168,348	170,839	173,367	175,933
0801 2401 10	Urban General	WAT URBAN GENERAL MAINTENANCE	17,361,167	813,437	818,602	823,532	830,013	835,996	842,407	848,266	854,307	860,148	865,999	871,501	877,038	882,611	888,219	893,862	899,542	905,257	911,009	916,797	922,623
0801 2401 11	Urban General	WAT DATRAN MAINTENANCE	1,364,092	63,913	64,319	64,706	65,215	65,685	66,189	66,649	67,124	67,583	68,043	68,475	68,910	69,348	69,789	70,232	70,678	71,127	71,579	72,034	72,492
0801 2401 14	Collingwood	WAT COLLINGWOOD MAINTENANCE	604,500	28,875	28,875	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375	30,375
0801 2401 12	Motueka	WAT MOTUEKA MAINTENANCE	1,237,357	0	0	0	0	0	0	0	0	0	0	0	0	150,000	151,311	152,633	153,967	155,313	156,671	158,040	159,421
0801 2401 13	Pohara	WAT POHARA MAINTENANCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0825 2401	Mapua Ruby Bay	WAT COASTAL PIPELINE MAINTENANCE	649,955	0	0	0	0	0	0	0	0	50,000	50,624	51,373	52,134	52,905	53,688	54,483	55,289	56,107	56,937	57,780	58,635
0825 2401 01	Mapua Ruby Bay	WAT COASTAL TASMAN AREA MAINTENANCE	84,268	0	0	0	0	0	0	0	0	0	0	0	0	10,000	10,148	10,298	10,451	10,605	10,762	10,921	11,083
0813 2401	Urban General	WAT MARAHAU MAINTENANCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0826 2401	Urban General	WAT TAKAKA MAINTENANCE	248,017	11,621	11,694	11,765	11,857	11,943	12,034	12,118	12,204	12,288	12,371	12,450	12,529	12,609	12,689	12,769	12,851	12,932	13,014	13,097	13,180
0802 2401	Motueka	WAT MOTUEKA RETICULATION MTCE	1,209,807	88,619	90,693	92,687	95,080	97,473	99,866	102,259	104,652	107,045	109,518	110,475	111,440								
0802 2401 01	Motueka	WAT MOTUEKA FIRE WELLS MTCE	241,961	17,724	18,139	18,537	19,016	19,495	19,973	20,452	20,930	21,409	21,904	22,095	22,288								
0804 2401	88 Valley	WAT 88 VALLEY GENERAL MAINTENANCE	942,000	46,200	46,200	46,200	46,200	46,200	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400	47,400
0805 2401	Dovedale	WAT DOVEDALE GENERAL MAINTENANCE	2,117,940	104,302	104,302	104,655	104,655	105,007	105,007	105,359	105,359	105,712	105,712	106,070	106,070	106,429	106,429	106,787	106,787	107,145	107,145	107,504	107,504
0806 2401	Redwoods Valley	WAT REDWOOD GENERAL MAINTENANCE	1,538,698	75,075	75,282	75,282	75,282	75,490	76,990	76,990	77,201	77,201	77,201	77,414	77,414	77,414	77,627	77,627	77,627	77,841	77,841	77,841	78,056
0807 2401	Hamama	WAT HAMAMA GENERAL MAINTENANCE	138,600	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930	6,930
0808 2401	Pohara	WAT POHARA GENERAL MAINTENANCE	601,386	23,100	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600	26,240	27,989	29,855	31,846	33,969	36,233	38,649	41,225	43,974	46,905
0809 2401 01	Urban General	WAT WAI ITI DAM MAINTENANCE	426,859	20,000	20,127	20,248	20,408	20,555	20,712	20,856	21,005	21,148	21,292	21,428	21,564	21,701	21,839	21,977	22,117	22,258	22,399	22,541	22,685
		WAT TAKAKA FIREWELLS G MAINTEN																					
		SubTotal	43,498,589	1,933,990	1,977,180	1,995,054	2,017,104	2,035,830	2,057,525	2,075,905	2,094,583	2,163,115	2,182,120	2,198,616	2,214,793	2,256,692	2,273,895	2,291,526	2,309,094	2,327,539	2,345,730	2,364,610	2,383,689
ELECTRICITY																							
0801 2505	Urban General	URBAN ELECTRICITY	9,559,439	450,835	453,588	456,357	459,144	461,948	464,769	467,607	470,462	473,335	476,226	479,134	482,060	485,003	487,965	490,945	493,943	496,959	499,994	503,047	506,119
0802 2505	Motueka	MOTUEKA ELECTRICITY	867,732	34,651	35,449	36,265	37,100	37,954	38,828	39,722	40,636	41,572	42,529	43,508	44,509	45,534	46,582	47,654	48,751	49,873	51,022	52,196	53,398
0804 2505	88 Valley	88 VLY ELECTRICITY	27,103	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355	1,355
0805 2505	Dovedale	DOVEDALE ELECTRICITY	595,354	28,820	28,918	29,016	29,114	29,213	29,312	29,412	29,511	29,611	29,712	29,812	29,913	30,015	30,117	30,219	30,321	30,424	30,527	30,631	30,734
0806 2505	Redwoods Valley	REDWOODS ELECTRICITY	704,512	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226	35,226
08262505	Urban General	TAKAKA ELECTRICITY	28,734	1,355	1,363	1,372	1,380	1,389	1,397	1,406	1,414	1,423	1,431	1,440	1,449	1,458	1,467	1,476	1,485	1,494	1,503	1,512	1,521
0808 2505	Pohara	POHARA ELECTRICITY	125,718	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286	6,286
		SubTotal	11,908,591	558,528	562,185	565,877	569,605	573,370	577,173	581,012	584,891	588,808	592,764	596,761	600,798	604,876	608,997	613,160	617,366	621,617	625,912	630,252	634,639
PROFFESSIONAL SERVICES																							
0801 2203	Urban General	WAT GEN P/S CONSULTANTS	7,817,468	368,681	370,933	373,198	375,477	377,769	380,076	382,397	384,732	387,082	389,445	391,824	394,216	396,624	399,046	401,482	403,934	406,401	408,882	411,379	413,891
0801 2404	Urban General	WATER METER READING	607,681	28,659	28,834	29,010	29,187	29,365	29,545	29,725	29,907	30,089	30,273	30,458	30,644	30,831	31,019	31,209	31,399	31,591	31,784	31,978	32,173
0801 2607	Urban General	WAT PURCHASE N C C	341,334	16,098	16,196	16,295	16,394	16,495	16,595	16,697	16,799	16,901	17,004	17,108	17,213	17,318	17,424	17,530	17,637	17,745	17,853	17,962	18,072
0804 2203	88 Valley	WAT 88 VALLEY P/S CONSULTANTS	82,999	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150
0805 2203	Dovedale	WAT DOVEDALE P/S CONSULTANTS	161,055	7,797	7,823	7,849	7,876	7,903	7,930	7,956	7,983	8,010	8,038	8,065	8,092	8,120	8,147	8,175	8,202	8,230	8,258	8,286	8,314
0806 2203	Redwoods Valley	WAT REDWOOD P/S CONSULTANTS	178,862	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943	8,943
0808 2203	Pohara	WAT POHARA P/S CONSULTANTS	28,064	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403
0809 2203	Urban General	WAT WAI-ITI DAM PROF SERVICES	250,000	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
0809 220301	Urban General	WAT WAI-ITI DAM SAFETY REVIEWS	280,000	30,000	10,000	10,000	10,000	10,000	30,000	10,000	10,000	10,000	10,000	30,000	10,000	10,000	10,000	10,000	30,000	10,000	10,000	10,000	10,000
0809 2605	Urban General	WAT WAI-ITI DAM MONITORING	300,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
			0																				
0801 2203 01	Urban General	WAT RESOURCE CONSENT P/S	125,356	5,912	5,948	5,984	6,021	6,058	6,095	6,132	6,169	6,207	6,245	6,283	6,321	6,360	6,399	6,438	6,477	6,517	6,557	6,597	6,637
0801260501	Urban General	WAT RESOURCE CONSENT MONITORING	586,667	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333	29,333
0801220304		WAT - A M PLAN P/S	956,250	9,375	84,375	56,250	9,375	84,375	56,250	9,375	84,375	56,250	9,375	84,375	56,250	9,375	84,375	56,250	9,375	84,375	56,250	9,375	46,875
0801220306		WAT WATER ASSESSMENTS	112,500	0	0	0	37,500	0	0	0	0	0	37,500	0	0	0	0	0	37,500	0	0	0	0
0801220307		WAT PUBLIC HEALTH PLANS (PHRMP)	1,323,750	53,750	91,250	88,750	71,250	126,875	131,875	111,875	76,875	71,875	84,375	45,000	35,000	50,000	35,000	25,000	35,000	50,000	35,000	45,000	60,000
0801252601		WAT URBAN MODELLING	700,000	35,000	10,000	60,000	10,000	60,000	35,000	60,000	10,000	10,000	10,000	85,000	60,000	10,000	10,000	60,000	35,000	60,000	10,000	10,000	60,000
0801220310		WAT O&M CONTRACT TENDER	291,200	18,200	0	0	91,000	0	0	0	0	0	91,000	0	0	0	0	0	91,000	0	0	0	0
0801220315		WAT P/S CONTRACT TENDER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08012205		WAT VALUATIONS	127,400	18,200	0	0	18,200	0	0	18,200	0	0	18,200	0	0	18,200	0	0	18,200	0	0	18,200	0
			0																				
0801252604		DEMAND, PRESSURE, FLOW MANAGEMENT	337,500	0	27,000	27,000	18,000	18,000	18,000	18,000	45,000	40,500	18,000	18,000	18,000	45,000	0	0	0	0	0	27,000	0
08012605		WAT NIGHT FLOW MONITORING	168,000	12,000	12,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
0801220316		RURAL SCHEME EASEMENT	100,000	0	20,000	0	20,000	0	20,000	0	20,000	0	20,000	0	0	0	0	0	0	0	0	0	0
0801220317			0																				
0801220318		INSPECTION OF WATER STRUCTURE ASSETS	320,000	30,000	50,000	0	0	0	0	30,000	50,000	0	0	0	30,000	50,000	0	0	0	0	0	30,000	50,000
0801220319		REVIEW OF CURRENT BYLAWS	36,000	0	0	18,000	0	0	0	0	0	0	0	0	0	18,000	0	0	0	0	0	0	0
0801220320		FIRE HYDRANT AUDIT AND FLOW TESTS	270,000	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
0801220321		WATER SUPPLY OPERATIONS AND MAINTENANCE PLAN	390,000	60,000	80,000	80,000	80,000	15,000	15,000	15,000	15,000	15,000	15,000	0	0	0	0	0	0	0	0	0	0
			0																				
0801220322		LEAKAGE DETECTION PROGRAMME	373,100	22,750	22,750	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200
0801220323		INTAKE FLOW METER PROGRAMME	27,500	13,750	13,750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0801220324		WATER SUPPLY ANNUAL SURVEY	183,333	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167	9,167
0801220325		WATER DEMAND INITIATIVES	324,000	0	0	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
0801220326		WINZ DATA MANAGEMENT	275,000	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750	13,750
0801220327			0																				

Ledger Code		GENERAL OPERATING & MAINTENANCE	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
PROFFESSIONAL SERVICES - MOTUEKA RETICULATION																							
08022404		WATER METER READING	67,520	3,184	3,204	3,223	3,243	3,263	3,283	3,303	3,323	3,343	3,364	3,384	3,405	3,426	3,447	3,468	3,489	3,510	3,532	3,553	3,575
0802220308		WAT RESOURCE CONSENT P/S	11,396	537	541	544	547	551	554	557	561	564	568	571	575	578	582	585	589	592	596	600	603
0802260501		WAT RESOURCE CONSENT MONITORING	53,333	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667	2,667
0802220306		WAT - A M PLAN P/S	54,188	531	4,781	3,188	531	4,781	3,188	531	4,781	3,188	531	4,781	3,188	531	4,781	3,188	531	4,781	3,188	531	2,656
0802220309		WAT WATER ASSESSMENTS	7,500	0	0	0	2,500	0	0	0	0	0	2,500	0	0	0	0	0	2,500	0	0	0	0
0802220310		WAT PUBLIC HEALTH PLANS (PHRMP)	23,750	1,250	1,250	1,250	1,250	3,125	3,125	3,125	3,125	3,125	3,125	0	0	0	0	0	0	0	0	0	0
0802220311		WAT URBAN MODELLING	120,000	30,000	0	0	0	0	30,000	0	0	0	0	30,000	0	0	0	0	30,000	0	0	0	0
0802220304		WAT O&M CONTRACT TENDER	24,480	1,530	0	0	7,650	0	0	0	0	0	7,650	0	0	0	0	0	7,650	0	0	0	0
08022205		WAT VALUATIONS	10,710	1,530	0	0	1,530	0	0	1,530	0	0	1,530	0	0	1,530	0	0	1,530	0	0	1,530	0
08022526		DEMAND, PRESSURE, FLOW MANAGEMENT	37,500	0	3,000	3,000	2,000	2,000	2,000	2,000	5,000	4,500	2,000	2,000	2,000	5,000	0	0	0	0	0	3,000	0
0802260502		WAT NIGHT FLOW MONITORING	42,000	3,000	3,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
0802220312		FIRE HYDRANT AUDIT AND FLOW TESTS	30,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
0802220313		LEAKAGE DETECTION PROGRAMME	36,900	2,250	2,250	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
0802220314		INTAKE FLOW METER PROGRAMME	2,500	1,250	1,250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0802220315		WATER SUPPLY ANNUAL SURVEY	16,667	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833
0802220316		WATER DEMAND INITIATIVES	36,000	0	0	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
0802220317		WINZ DATA MANAGEMENT	25,000	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
0802220303		WATER SUPPLY OPERATIONS AND MAINTENANCE PLAN - MOTUEKA	29,000	20,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0	0	0	0	0	0	0	0	0	0
0802 2203	Motueka	WAT MOTUEKA - retic P/S CONSULTANTS	326,845	13,052	13,352	13,660	13,974	14,296	14,625	14,962	15,306	15,659	16,019	16,388	16,765	17,151	17,546	17,950	18,363	18,786	19,218	19,660	20,113
PROFFESSIONAL SERVICES - MOTUEKA FIREWELLS																							
0802220307		WAT - A M PLAN P/S	9,563	94	844	563	94	844	563	94	844	563	94	844	563	94	844	563	94	844	563	94	469
0802220305		WAT O&M CONTRACT TENDER	4,320	270	0	0	1,350	0	0	0	0	0	1,350	0	0	0	0	0	1,350	0	0	0	0
0802220501		WAT VALUATIONS	1,890	270	0	0	270	0	0	270	0	0	270	0	0	270	0	0	270	0	0	270	0
0802 220301	Motueka	WAT MOTUEKA - Firewells P/S CONSULTANTS	57,677	2,303	2,356	2,411	2,466	2,523	2,581	2,640	2,701	2,763	2,827	2,892	2,958	3,027	3,096	3,168	3,240	3,315	3,391	3,469	3,549
		PROFFESSIONAL SERVICES Total	18,103,757	925,220	1,001,683	965,170	1,002,682	948,218	971,279	909,366	957,478	850,615	971,279	940,969	859,186	865,430	795,701	809,000	957,327	870,683	779,067	822,481	900,924
		Water General Operating and Maintenance Total	$ 73,510,938	**3,417,738**	**3,541,048**	**3,526,102**	**3,589,392**	**3,557,418**	**3,605,977**	**3,566,283**	**3,636,951**	**3,602,537**	**3,746,163**	**3,736,345**	**3,674,776**	**3,726,998**	**3,678,592**	**3,713,686**	**3,883,787**	**3,819,839**	**3,750,709**	**3,817,343**	**3,919,252**

Note: Does not include inflation

APPENDIX F. DEMAND AND FUTURE NEW CAPITAL REQUIREMENTS

F.1 Growth Demand and Supply Model (GDSM)

F.1.1. Model Summary

A comprehensive Growth Demand and Supply Model (GDSM or growth model) has been developed to provide predictive information for population growth and business growth, and from that, information about dwelling and building development across the district and demand for infrastructure services. The GDSM underpins the Council's long term planning through the Activity Management Plans, Long Term Plans and supporting policies (eg. Development Contributions Policy).

This 2011 GDSM is a third generation growth model with previous versions being completed in 2005 and 2008.

In order to understand how and where growth will occur, the GDSM is built up of a series of Settlement Areas (SA) which contain Development Areas (DA). A Settlement Area is defined for each of the main towns and communities in the district. There are 17 Settlement Areas for the present version of the GDSM. Each Settlement Area is sub-divided into a number of Development Areas. Each Development Area is defined as one continuous polygon within a Settlement Area that if assessed as developable, is expected to contain a common end-use and density for built development.

The GDSM organises and integrates the assessments of demand and supply of built development. The development is categorised as either residential or business demand and supply. For residential demand and supply:

- the 'demand' for residential buildings (dwellings) is assessed from population and household growth forecasts
- the 'supply' of lots for future dwellings is assessed from analysis of the Development Areas in each Settlement Area and how many lots could feasibly be developed for residential end use, after accounting for a number of existing characteristics of the Development Area.

For business demand and supply:

- the 'demand' for business premises is assessed from economic and employment growth forecasts, and associated land requirements
- the 'supply' of lots for future business premises is assessed from analysis of the Development Areas in each Settlement Area in a similar way as that for future dwellings.

The Development Areas and Settlement Areas are the building blocks that allow the GDSM to spread demand for new dwellings and business premises, and assess where there is capacity to supply that demand.

The GDSM is not just an isolated tool that calculates a development forecast. It is a number of linked processes that involve assessment of base data, expert interpretation and assessment, calculation and forecasting. The key input data, assessment and computational processes, and outputs of the GDSM are captured in a database called the Growth Model Database.

The outputs of the GDSM are located on a shared browser site that all Council staff have access to. The browser contains:

- all the various input data sets and calculated outputs
- maps defining the Settlement Areas and Development Areas
- a model description describing the model working in detail, assumptions and planned improvements
- a peer review by a qualified urban planner and designer.

F.1.2. Population Projection

The population projection in the GDSM has been taken from Statistics New Zealand 2009 population projections derived from the 2006 census data. The Statistics NZ "medium" projection has been taken for all Settlement Areas. As a result of the recession and general slowdown in development since 2008, Council has adopted the Statistics NZ "medium" projection for all Settlement Areas (in 2008 the Statistics NZ "high" projection was used for Motueka and Richmond). The population projections for each Settlement Area and the district as a whole are shown in Table F-1.

Table F-1: Population Projection Used in the GDSM

Settlement Area	Population Adjusted 2006	2009	2012	2016	2021	2031
Brightwater	1,931	2,016	2,097	2,195	2,327	2,581
Coastal Tasman Area	2,032	2,096	2,157	2,228	2,308	2,438
Collingwood	203	207	211	216	220	225
Kaiteriteri	320	323	326	332	336	332
Mapua Ruby Bay	1,911	1,981	2,049	2,135	2,242	2,427
Marahau	120	121	123	125	127	125
Motueka	6,309	6,417	6,510	6,600	6,660	6,634
Murchison	414	409	404	398	382	366
Pohara/Tata/Ligar/Tarakohe	558	570	581	594	606	619
Richmond	13,173	13,612	14,039	14,577	15,179	16,305
Riwaka	562	577	591	606	619	625
St Arnaud	81	81	81	81	80	77
Takaka	1,154	1,160	1,164	1,164	1,144	1,054
Tapawera	299	311	323	334	341	355
Tasman	168	173	177	182	187	194
Upper Moutere	147	152	156	162	169	181
Wakefield	1,911	1,992	2,067	2,152	2,258	2,499
Ward Remainder (Golden Bay)	3,244	3,315	3,381	3,455	3,523	3,600
Ward Remainder (Lakes Murchison)	2,475	2,538	2,596	2,659	2,738	2,870
Ward Remainder (Motueka)	3,313	3,417	3,516	3,632	3,763	3,975
Ward Remainder (Moutere Waimea)	3,988	4,114	4,232	4,372	4,530	4,785
Ward Remainder (Richmond)	1,487	1,522	1,588	1,756	1,966	2,405
Total for District	**45,800**	**47,104**	**48,369**	**49,955**	**51,705**	**54,672**

The population projections are used to determine a demand for new dwellings in each Settlement Area.

F.1.3. Business Forecast

In the GDSM 2008 for the LTP 2009 – 2019, three economic demand assessments were used to build a quantitative picture of business growth in terms of employment growth and linked growth in demand for business space. Each study provided different datasets, but an aggregate picture of estimated business land demand in the Tasman district, including, Motueka and Environs, Golden Bay, and Tasman district balance including Richmond.

For the GDSM 2011, a high level consideration of business growth opportunities showed that in the two main demand areas (Richmond as part of the eastern sub-regional demand catchment of Nelson-Tasman, and at Motueka as the centre of the western sub-regional demand catchment), there is a large business land supply capacity becoming available for business development.

This includes the current deferred business zonings in both the Richmond West Development Area, and draft deferred zonings in Motueka West Development Area. It was considered this amount of supply capacity will meet the expected needs of business growth for at least 50 years (well beyond the 20 year projection). On this basis the 2011 review of the GDSM simply adopted the data and assumptions in the 2008 GDSM but updated the datasets by extrapolation for a further three years (2029 to 2032).

Looking ahead, there are three main difficulties with relying on the historical demand assessments as the basis for business growth demand forecasts:

- the economic modelling by the consultants' assessments used two different sets of now-dated census data for economic and employment growth
- the demand assessment methods have yielded results of limited reliability at the level of individual SAs, as the areas assessed yielded aggregate results from an undisclosed simulation economic modelling routine, that have then been apportioned and subject to a number of simplifying assumptions
- the consultant work done is not in a Council managed information system and does not provide a confident results in a regional (Nelson-Tasman) context especially for future Nelson-Richmond urban area forecasting.

What is required is the development of a regional (Nelson-Tasman) economic simulation model capable of yielding results at the SA level, and suitably populated with current data, to yield more reliable segmented business land demand estimates, for each SA. This is a strategic priority for further work after the completion of the GDSM 2011 review.

F.1.4. Rollout Assessment

Once the analysis of demand for residential dwellings and buildings in each Settlement Area has been completed, and when the supply potential for new subdivision and dwelling/building construction has been assessed for each Development Area. The rollout analysis is done. This seeks to forecast when and if the demand for dwelling and business premises will be met and if so where and when. This results in a forecast for each Development Area of:

- the number of new residential dwellings that will be created through subdivision or building on vacant lots
- the number of new business buildings that will be created through subdivision or building on vacant lots.

This information can then be used to plan how and where network infrastructure needs to be developed and to what capacity.

F.2 Projection of Demand for Water Services

F.2.1. Forecast Growth in Demand from GDSM

The forecast growth in demand from the GDSM growth forecasts is shown in Table F-2 to Table F-5 following.

Table F-2: Growth of Water Connections in Urban Water Supplies

Water Supply Name	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Brightwater Hope	1,002	1,012	1,021	1,034	1,046	1,058	1,070	1,082	1,094	1,103
Collingwood	216	216	216	216	216	216	216	216	216	216
Kaiteriteri	589	589	589	591	592	595	596	598	599	602
Mapua Ruby Bay	788	797	805	818	830	843	855	868	881	892
Murchison	307	307	307	307	307	307	307	307	307	307
Richmond & Waimea	5,554	5,585	5,616	5,670	5,724	5,778	5,832	5,886	5,940	5,998
Tapawera	167	168	169	169	169	169	169	169	169	169
Upper Takaka	19	19	19	19	19	19	19	19	19	19
Wakefield	746	749	752	758	763	769	774	779	784	788
Pohara Valley	51	51	51	51	51	51	51	51	51	51
Total - all Urban Water Supplies	**9,439**	**9,493**	**9,545**	**9,633**	**9,717**	**9,805**	**9,889**	**9,975**	**10,060**	**10,145**

Table F-3: Growth of Water Connections in Community Water Supplies

Water Supply Name	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Motueka[3]	1,111	1,137	1,777	2,627	3,268	3,298	3,328	3,358	3,388	3,419

Table F-4: Growth of Water Connections in Rural Water Supplies

Water Supply Name	Flow per unit (m^3/day)	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Dovedale RWS	2	296	296	297	297	298	298	299	299	300	300
Redwood Valley RWS	2	362	363	363	363	364	364	365	365	365	365
88 Valley RWS	1	186	186	186	186	186	186	186	186	186	186
Hamama - connections		25	25	25	25	25	25	25	25	25	25

Table F-5: Growth of Water Connections in Rural Extensions

Water Supply Name	Flow per unit (m^3/day)	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Richmond Rural Ext	2	132	132	132	132	132	132	132	132	132	132
Best Island Rural Ext	2	32	32	32	32	32	32	32	32	32	32
Brightwater/Hope Rural Ext	2	150	150	150	150	150	150	150	150	150	150
Collingwood Rural Ext	2	1	1	1	1	1	1	1	1	1	1
Mapua Rural Ext	1	230	230	230	230	230	230	230	230	230	230
Murchison Rural Ext	2	2	2	2	2	2	2	2	2	2	2
Tapawera Rural Ext	2	1	1	1	1	1	1	1	1	1	1
Wakefield Rural Ext	2	56	56	56	58	60	62	64	66	68	70
Total - All Rural Extensions		**604**	**604**	**604**	**606**	**608**	**610**	**612**	**614**	**616**	**618**

[3] Note, the forecast for Motueka assumes the Motueka Urban Water Supply is constructed over 2013 to 2016.

F.2.2. Effect of Population Growth on Water Supply

The population growth anticipated in the district will have a significant impact on the water supply assets.

- Water Source: Some systems are experiencing demand higher than the permitted water take, particularly during the summer months when water restrictions may be in place. The implications are that new connections are not being allowed to the system. New sources need to be located and developed and levels of water loss need to be reduced.
- Water Reticulation: Certain areas of reticulation are already at capacity meaning that unless these are upsized, no new growth can be serviced.

In terms of specific components of the water supply systems, the required responses are as follows:

- new reticulation and storage is required to service expected growth to the south and to the east of Richmond
- rezoning of Richmond to maximise the use of the Waimea supply
- a supplementary Richmond source also needs to be developed to meet demand
- new source and treatment plant to service Wakefield
- reservoirs and mains rezoning for Wakefield and 88 Valley
- rural extension from Brightwater to serve Teapot Valley
- construction of the Costal Tasman Area (CTA) reticulation and Coastal Pipeline to allow growth and development in the Coastal Tasman and Mapua regions.

F.2.2.1 New or Expanded Schemes

Projections for future growth in demand for water supply services must take into account not only new developments but also existing residents from unserviced areas connecting to Council services.

Anticipated new developments and asset creation include the following significant schemes.

- Motueka – Whilst groundwater is readily available for private use in Motueka, the shallowness of the aquifers and the density of the population make the continuation of this practice a potential public health risk. Council is in the process of obtaining a resource consent to abstract water from a secure, deep aquifer. Sufficient water will be readily available to allow full reticulation of the town. At the time when the Ten Year Plan was produced, we noted the potential to receive a Government subsidy to offset some of the costs of the project on the community. Council decided to proceed with the project only if it received a satisfactory Government subsidy. Late in 2011 Council was advised that the application was not successful. Council has, therefore, deferred the project in the Draft Long Term Plan to start around 2021 when it will consider re-applying for a Government subsidy and undertaking further consultation with the Motueka community on any proposed scheme. The cost of the project is in the order of $16,500,000. In the meantime, Council will continue to monitor the water supply and public health issues in Motueka.
- The Coastal Pipeline and CTA – The proposed coastal pipeline scheme represents a significant opportunity for development of the rural expansion zones between Motueka and Mapua. The increase in demand for public supplies from existing residents in unserviced areas, together with the demand for new rural ‘lifestyle’ properties raises the potential for expansion. Current private surface, rainwater or shallow well sources may not meet future quality standards and public expectations. The Coastal pipeline would provide part of the infrastructure to attract new investment and development to this area. Construction of these schemes will commence within the 10 year timeframe, and remaining stages of the work are scheduled within the 20 year horizon.
- Pohara – There is a lot of unmet demand all along the Pohara to Tata Beach coast that cannot be supplied from the limited existing Pohara scheme. The nearest water source of acceptable quality and yield is the Takaka aquifers. The WSSA report identified Pohara as a Priority 2 community which would benefit from a new town drinking water supply. The new Pohara scheme would include supply to all coastal communities to Tata Beach and is currently scheduled to commence in 2029/30 following extensive community consultation.

- Marahau – This community has a limited supply of potable water. Rainwater tanks are currently the main water source. With the combined pressures of growth potential and tourism, Council considers that Marahau would benefit from a public water supply scheme. A scheme to provide a new town drinking water supply has been scheduled to commence in 2029/30 following extensive community consultation.
- Wakefield – In order to meet growing demand in Wakefield, a new water source must be established and treated, to ensure sufficient water is available. The current source is not adequate to meet projected growth. Construction for a new water treatment plant and source is scheduled to be completed by the end of 2016/17.

F.2.3. Implications of Changes in Community Expectations

Community expectations vary geographically and over time. Key trends in community expectations that the Council recognises include those listed in Table F-6 below.

Table F-6: Community Expectations

Trends in Community Expectations	Implications for Water Supplies	How Council Plans to Address the Issues
Rural water supply customers, particularly the farming community, are resistant to expenditure required to meet drinking water standards, especially where water is also for stock use.	Conflict with scheme users and management committees when rates rise to fund improvements.	Continue to inform management committees of current legislation and make clear that Council cannot decide not to meet their legal obligations.
'Lifestyle' property owners in rural water supply areas have high expectations of service level standards, and feel that rural supplies should deliver to the same standards as urban systems.	These expectations have resulted in a growing number of complaints, and an increase in costs associated with dealing with the complaints. Additionally, there are instances of unwise use and wastage of water in rural schemes because of misunderstandings of service level and capacity.	Council will issue a rural water supply policy statement to new customers, and continue to educate rural scheme users about wise water user practices and the limitations of the rural service.
Urban customers' expectations of achievable water quality standards are increasing.	Resulting in higher number of complaints. Need to improve treatment.	Treatment upgrades or new sources are planned for the majority of schemes to meet DWSNZ:2005 (Revised 2008).
In general, the public and communities of Tasman district are becoming more environmentally aware.	Council will need to be seen as a leader in sustainable practices and water conservation.	Continue to identify water conservation opportunities and reduce water leakage across the supply network.
Customers and communities are becoming less tolerant of water restrictions, rationing, and interruptions in supply.	Upgrades needed to defer or reduce the need for restrictions and rationing. Also need to take steps to improve assets in order to minimise the number of shutdowns and interruptions to supply.	Increase storage capacities, increase systems inter-connectedness and flexibility to transfer water to where it is needed, and increase the robustness of the system in general.

F.2.4. Implications of Industrial Demand

There are very few significant industrial users within the Tasman district supplied from Council sources. The exceptions are Nelson Pine Industries Ltd, ENZA and the Alliance Group Ltd meat processing works within Stoke. All of these industrial users are supplied from the Waimea system.
Industry sources have indicated that water demand for the existing large industrial water users will decrease with water saving initiatives. For the purposes of this 20 year plan it is assumed that the consumption will remain at approximately 700,000m^3/year. Council is in the process of reviewing contracts with the larger industrial water users.

It needs to be noted that the TRMP (30.2.3.1) lists priority end users for water. There is a possibility that supply to industrial users would be cut back in preference of domestic users and public health needs during rationing in times of severe drought.

F.2.5. Supply Agreement Changes

Almost all water supply schemes in Tasman have their own water sources that are controlled by resource consents. The exception is a supply agreement between Tasman District Council and Nelson City Council. This agreement stems from the joint funding of the construction of the Roding Dam and guarantees Tasman district 909 m^3/day from the Nelson City Council system at a set cost.

This has been a valuable supply for Richmond. Generally only 10m^3/day is taken, however during summer 2007/08 this source was almost fully utilised as a result of Stage 1 rationing being imposed in Richmond and the supply could not meet demand.

Maintaining use of the Nelson City Council supply serves two purposes:

- the original water right of 909m^3/per day is maintained
- flow of the water through the valved connection maintains good water quality within the pipeline by preventing stagnation.

F.2.6. Implications of Technological Change

Technological change has the ability to impact on the demand for a service. These changes can reduce or increase the demand for water supply infrastructure. Relevant examples are:

- household water saving devices like dual flush toilets, low-flow shower heads and front-loading washing machines which reduce water demand
- rainwater and grey water re-use schemes.

Similarly, technological advances can have an effect on the cost of maintenance and operation of assets. Relevant examples are:

- advances in treatment process could make quality improvements cost effective
- improvements in pump efficiency will decrease power consumption
- material improvements increase the base lives of assets
- advances in water leakage detection.

The potential impact of these technologies is currently unquantifiable, so no direct allowances have been made for them in this AMP.

F.2.7. Implications of Legislative Change

The Health (Drinking Water) Amendment Act 2007 (HDWAA) came into effect 1 July 2008. This means that compliance with DWSNZ:2005 is a legal requirement for Council. These standards have been revised and Council intend to comply with the newer standards – DWSNZ 2005 (revised 2008).

Significant treatment upgrades are therefore required for supplies that are not from secure groundwater sources. Similarly, a higher level of water quality monitoring will be required.

It is a requirement to complete a Public Health Risk Management Plan (PHRMP) for each water supply scheme. The timeframes for completing the PHRMPs was recently extended and these dates are shown in Table F-7 below. The timescale for the implementation of the upgrades is 12 months from approval of the PHRMP.

Provisions have been made in the financial forecasting to upgrade all treatment plants not currently complying with DWSNZ:2005 (revised 2008). However, some of these upgrades may not meet the timeframes due to monitoring, investigations required or new sources to be identified and developed. In these cases Council may be able to negotiate timeframes with the Ministry of Health (MoH) by demonstrating they are taking "all practical steps" to comply.

Table F-7: Timeframes for Compliance with (HDWAA)

Size of Supply	Population Served	PHRMP Date Due	Communities Affected
Large Supplies	> 10,000	1 July 2012	Richmond
Medium Supplies	5,001 – 10,000	1 July 2013	
Minor Supplies	501 – 5,000	1 July 2014	Brightwater/Hope, Wakefield, Motueka, Kaiteriteri/Riwaka, Mapua/Ruby Bay, Murchison, Redwood Valley, Dovedale
Small Supplies	101 – 500	1 July 2015	Collingwood, Tapawera, Pohara, 88 Valley
Neighbourhood Supplies	25 - 100	1 July 2016	Hamama, Upper Takaka

The Drinking Water Assistance Programme (DWAP) – the DWAP is a pool of subsidy funding available for water suppliers to aid with upgrading supplies to meet DWSNZ requirements. Funding was gained for Upper Takaka and Tapawera in 2008 and 2009. The DWAP was put on hold in 2009 till late 2010 whilst the viability of the programme was assessed. This assessment resulted in new criteria for funding being imposed. Most of the Council's schemes are no longer eligible for funding or would be a very low priority.

Water Gradings – Water gradings are no longer carried out now that it is mandatory to comply with the DWSNZ.

Similarly, in the future, it is expected that there will be greater demands on local government to manage their water assets in a more sustainable and integrated way. This is signalled in the following initiatives.

- Local Government Act: introduces a new philosophical approach that encompasses government's approach to sustainable development, ie. the concept of sustainable communities and the requirement to consider social, cultural, environmental and economic thinking in the Council's decision making, financial management and reporting. This act encourages from Council a higher level of environmental management responsibility and accountability.
- Ageing Pipes and Murky Waters (PCE, June 2000): Report by the Parliamentary Commissioner for the Environment (PCE) to identify the key sustainability issues and significant risks affecting the sustainable management of urban water systems. A major conclusion in this report is that New Zealand needs to manage its urban water systems (water supply, wastewater and stormwater) in an integrated and sustainable manner.
- Beyond Ageing Pipes. Urban Water Systems for the 21st Century, (PCE, April 2001): Following on from the discussion paper Ageing Pipes and Murky Waters (PCE, June 2000), this report presents the findings of the Parliamentary Commissioner for the Environment's investigation into urban water systems. The report highlights issues such as the fragmented nature of water management, the importance of raising stakeholder awareness of the issues, pricing and charging for water services and placing urban water systems into an ecological context.

F.3 Assessment of New Capital Works

During May to July 2011, a number of workshops with the asset managers, programme managers, Council consultants and operations and maintenance team were held to identify new works requirements. New works were identified by:

- reviewing levels of service and performance deficiencies
- reviewing risk assessments
- reviewing previously completed investigation and design reports
- using the collective knowledge and system understanding of the project team.

Each project identified was developed with a scope and a project cost estimate. Common project estimating templates were developed to ensure consistent estimating practices and rates were used. This is described in Appendix Q. The project estimate template includes:

- physical works estimates
- professional services estimates
- consenting and land purchase estimates
- contingencies for unknowns.

All estimates are documented and filed in an Estimates file to be held by Council. The information from the estimates has then been entered into the Capital Forecast spreadsheet that enables listing and summarising of the Capital Costs per project, per scheme, per project driver and per year. This has been used as the source data for input into Council's financial system for financial modelling.

F.4 Determination of Project Drivers and Programming

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

Operation and Maintenance:	operational activities which have no effect on asset condition but are necessary to keep the asset utilised appropriately and on-going day-to-day work required to keep assets operating at required service levels[4].
Renewals:	significant work that restores or replaces an existing asset towards its original size, condition or capacity[5].
Increase Level of Service:	works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to improve the level of service provided to existing customers.
Growth:	works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to provide for the anticipated demands of future growth.

This is necessary for two reasons as follows:

a) Schedule 13(1) (a) of the Local Government Act requires the local authority to identify the total costs it expects to have to meet relating to increased demand resulting from growth when intending to introduce a Development Contributions Policy.

b) Schedule 10(2)(1)(d)(l)-(iv) of the Local Government Act requires the local authority to identify the estimated costs of the provision of additional capacity and the division of these costs between changes to demand for, or consumption of, the service, and changes to service provision levels and standards.

All new works have been assessed against these project drivers. Some projects may be driven by a combination of these factors and an assessment has been made of the proportion attributed to each driver. A guideline was prepared to ensure a consistent approach to how each project is apportioned between the drivers.

[4] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114
[5] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114

Some projects may be driven fully or partly by needs for renewal. These aspects are covered in Appendix I.

The projects have been scheduled out across the 20 year period, primarily based on their drivers. They were then loaded into Mapinfo along with projects from all other engineering activities to allow Programme Managers to assess any programme clashes or optimisation opportunities.

F.4.1. Project Prioritisation

All projects identified as potential solutions to meet future demand, increase levels of service, or as renewal were discussed in workshops during May to July 2011. These workshops were attended by key council staff, key members of the MWH team, and representatives from council's contractors. Each project identified was assigned an initial project priority of either non-discretionary or discretionary where:

A non-discretionary investment is one that relates to:

- A critical asset, that without investment is likely or almost certain to fail within the next three years, with a medium, major or extreme impact
- Any asset that has a regulatory requirement to make the proposed investment.

A discretionary investment is one that relates to:

- a non-critical asset with no regulatory requirement to make the proposed investment
- a critical asset where asset failure is possible, unlikely or very unlikely to occur within the next three years with no regulatory requirement to make the proposed investment
- a critical asset where asset failure has only a negligible or minor impact with no regulatory requirement to make the proposed investment.

Council is currently reviewing the way that they prioritise their work programmes; the outcome of this review will be developed over the coming year to be implemented for the next Activity Management Plan update.

F.5 Developer Created Assets

Private developers generally construct new subdivisions with consent from the Council. It is very seldom that the Council itself constructs new subdivisions to service growth. Council is normally responsible for the upgrading/upsizing of existing assets to provide for increased volumes associated with growth.

Council does oversee the subdivision process, from consenting through to construction and handover to the Council. Council's engineers inspect design plans and finished works to ensure the assets meet the required standards and are in an acceptable condition to be accepted as a Council owned asset. Should any work not meet the required standards the Council will require the developer to remedy the issue prior to accepting ownership.

F.6 2012 – 2032 New Capital Works Forecast

The capital programme that has been forecast for this activity where the primary driver is classed as New Works (ie. growth or levels of service) is shown in Figure F-1, Figure F-2 and Figure F-3 following.

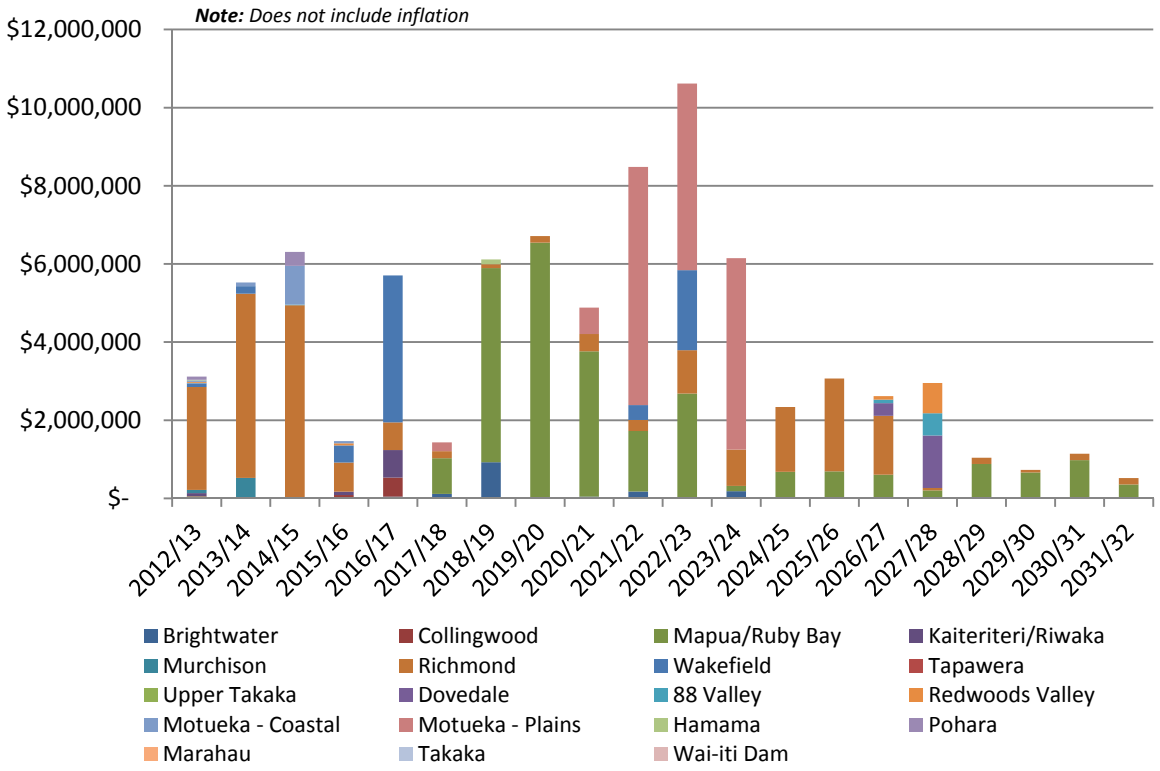


Figure F-1: 2012 – 2032 Water Supply New Capital Expenditure by Scheme

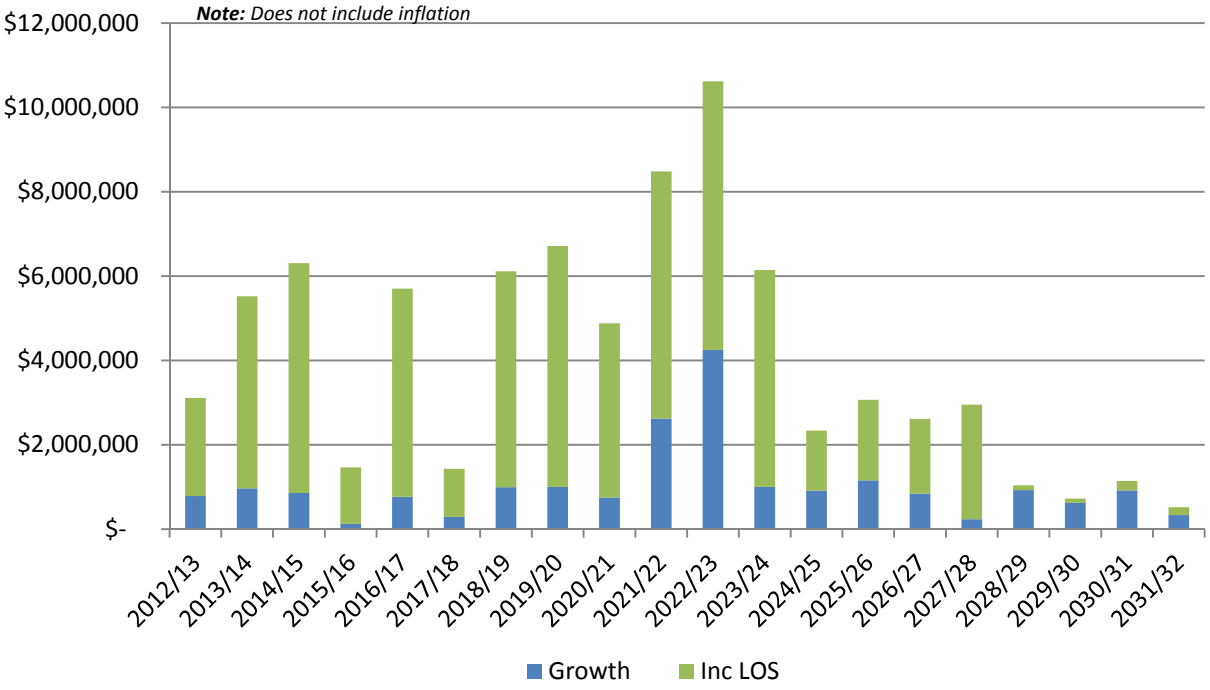
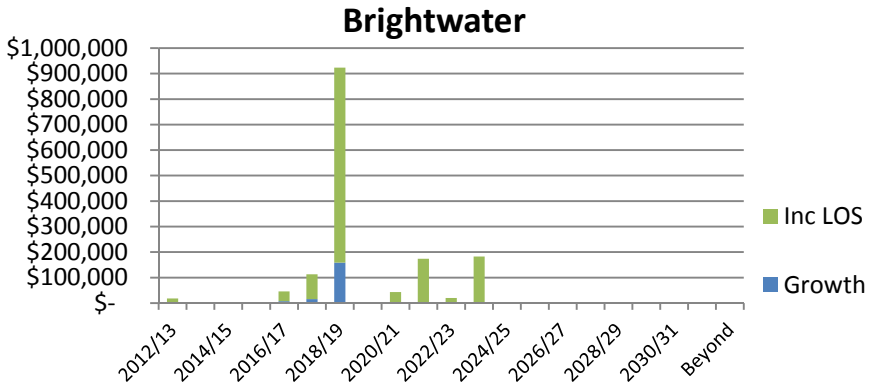
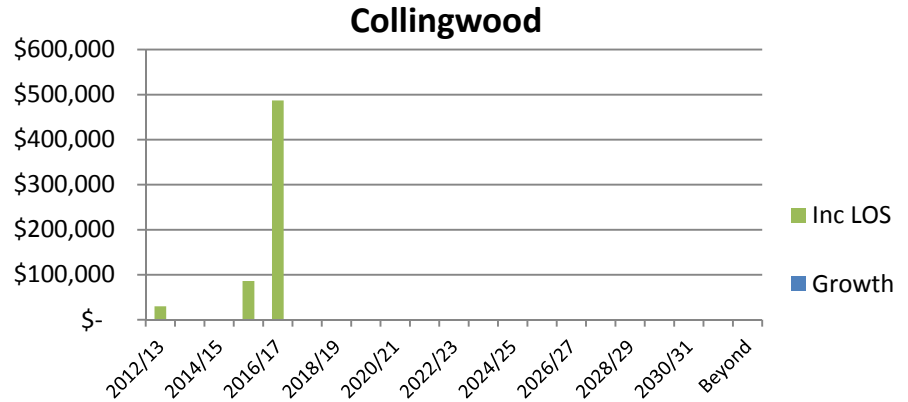


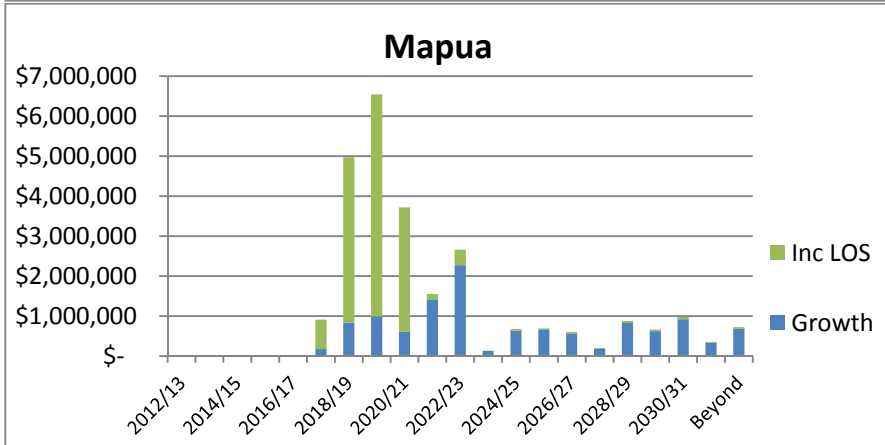
Figure F-2: 2012 – 2032 Water Supply New Capital Expenditure by Drivers



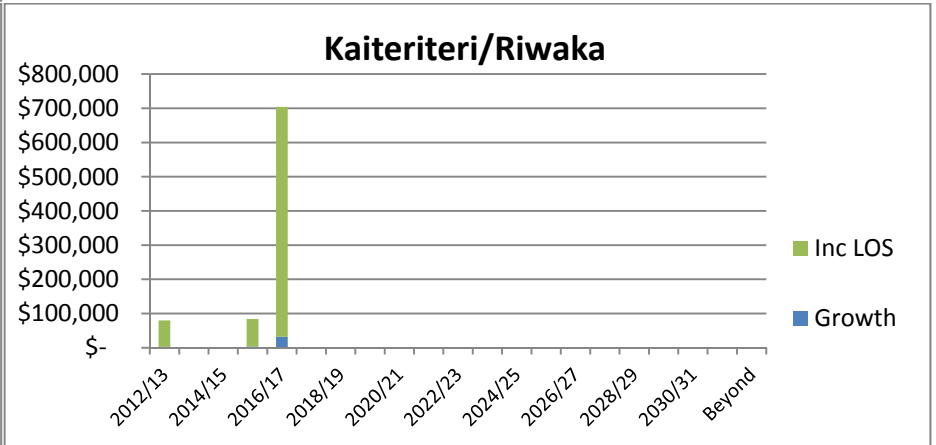
Major New Capital Works:
Treatment Plant Upgrade, yrs 2016 - 2019
SH 6 Main Replacement - Ranz Rd to Three Brothers, yrs 2020 - 2022
Supplementary Bore, yrs 2022 - 2024



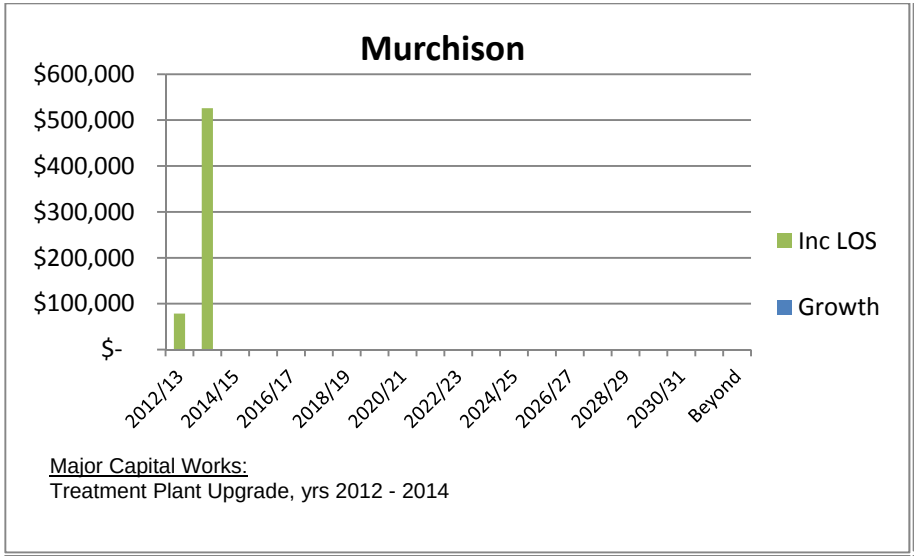
Major Capital Works:
Treatent Plant Upgrade, yrs 2015 - 2017



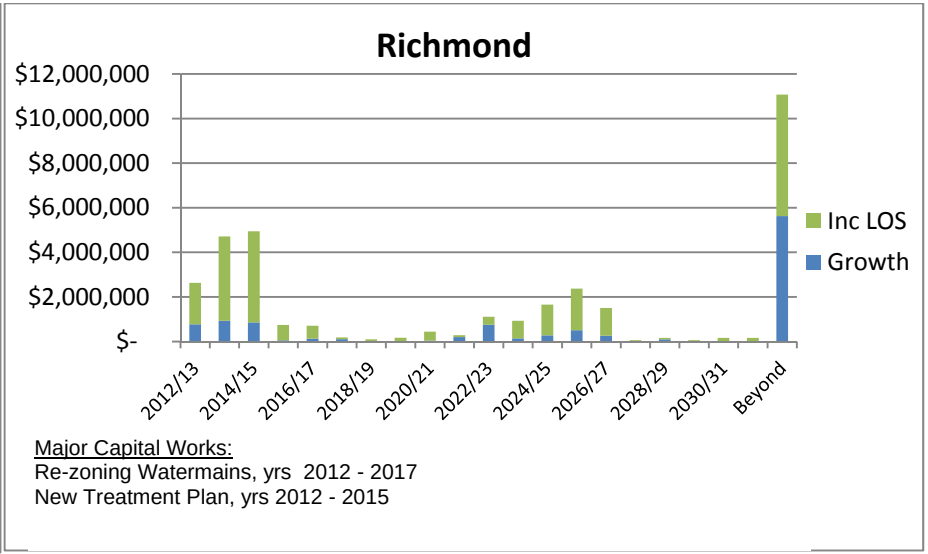
Major Capital Works:
CTA/Coastal Pipeline, yrs 2017 - beyond 2032



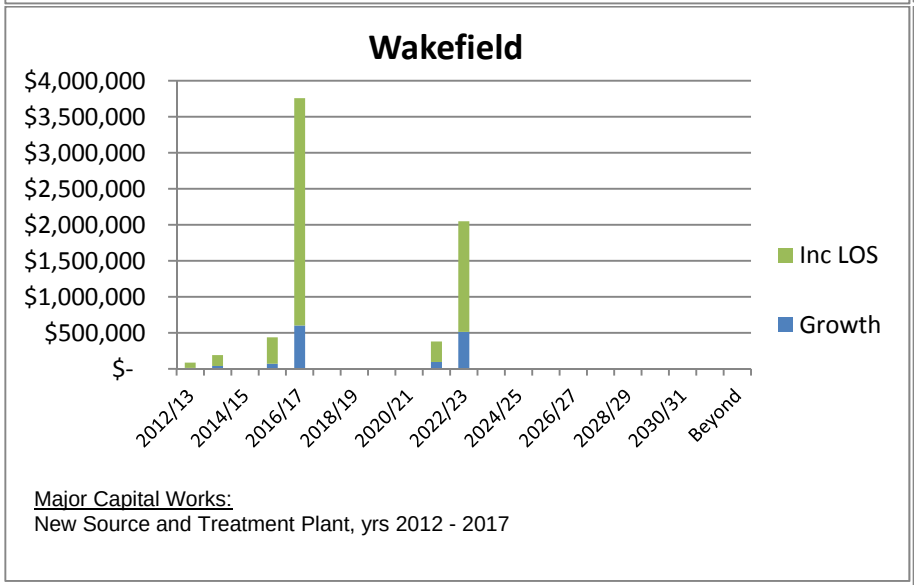
Major Capital Works:
Treatment Plant, yrs 2015 - 2017



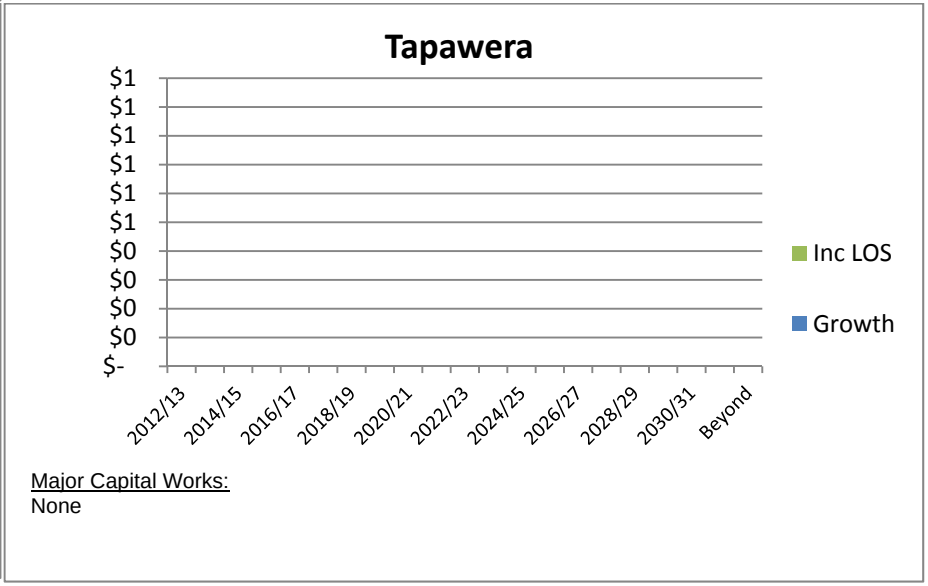
Major Capital Works:
Treatment Plant Upgrade, yrs 2012 - 2014



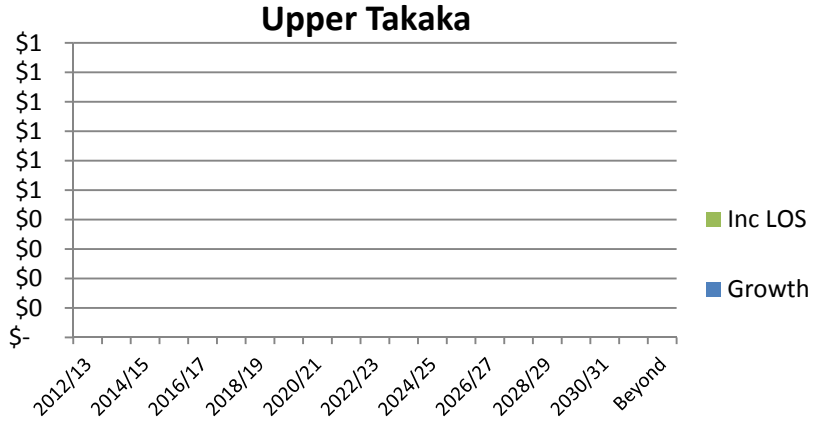
Major Capital Works:
Re-zoning Watermains, yrs 2012 - 2017
New Treatment Plan, yrs 2012 - 2015



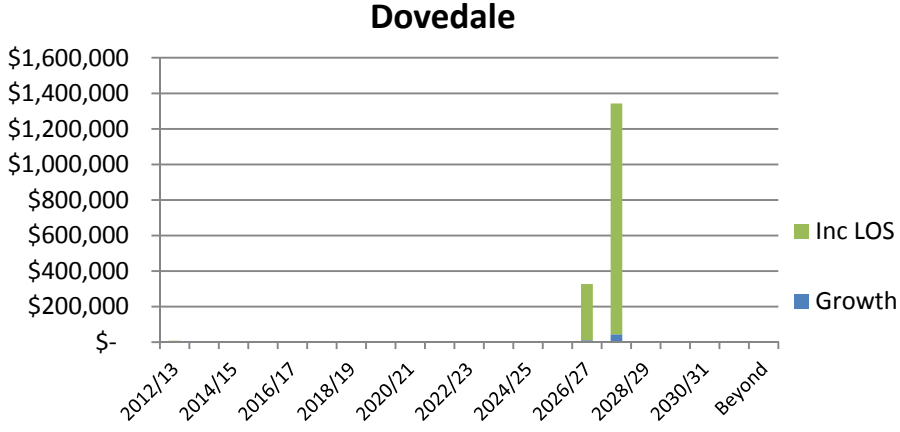
Major Capital Works:
New Source and Treatment Plant, yrs 2012 - 2017



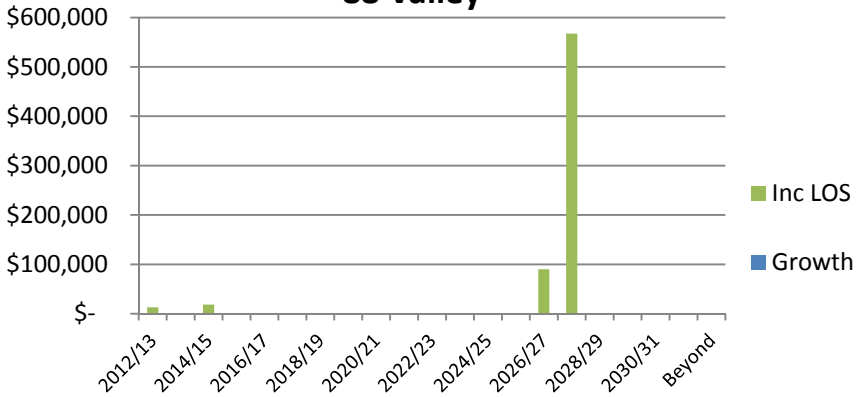
Major Capital Works:
None



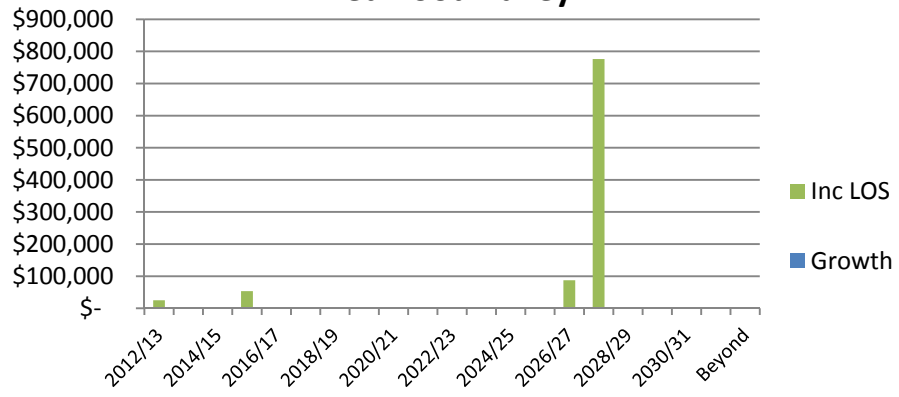
Major Capital Works:
None



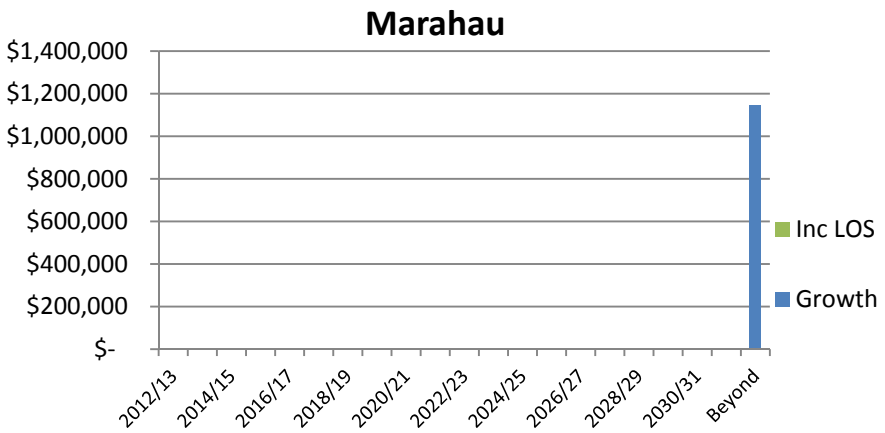
Major Capital Works:
New Source and Treatment Plant, yrs 2026 - 2028



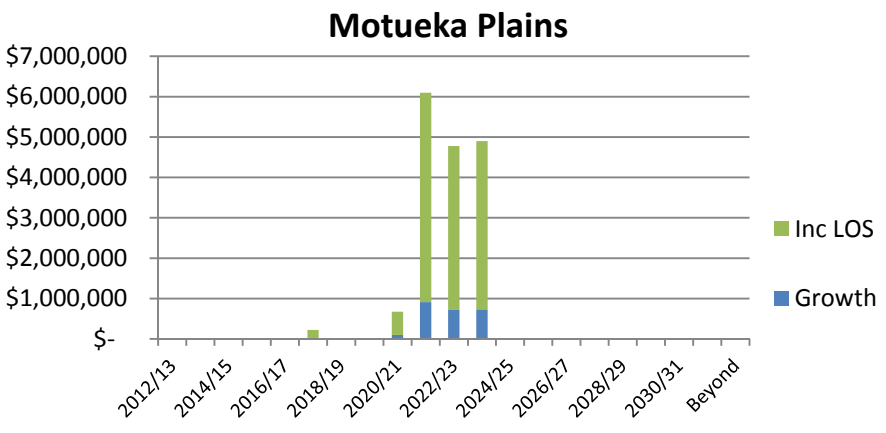
Major Capital Works:
Treatment Plant Upgrade, yrs 2026 - 2028



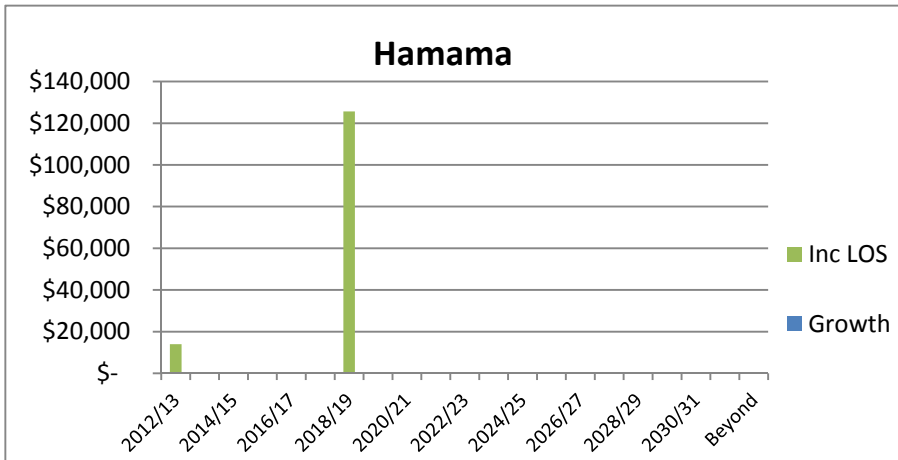
Major Capital Works:
Treatment Plant Upgrade, yrs 2026 -2028



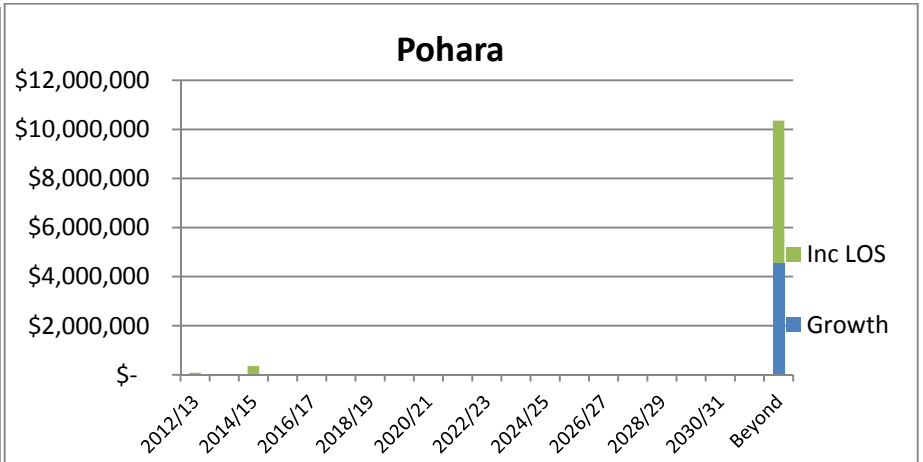
Major Capital Works:
New Town Supply , yrs beyond 2032



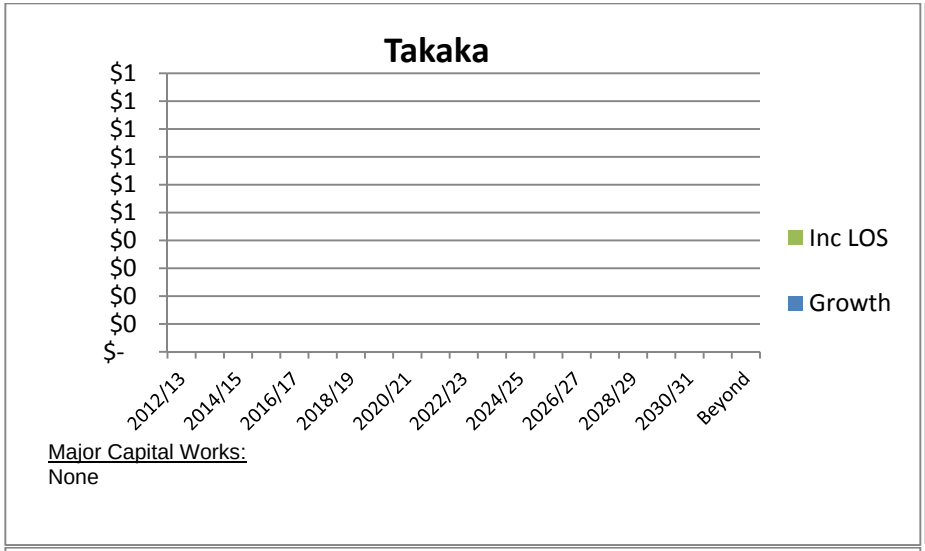
Major Capital Works:
New Town Supply, yrs 2020 - 2024

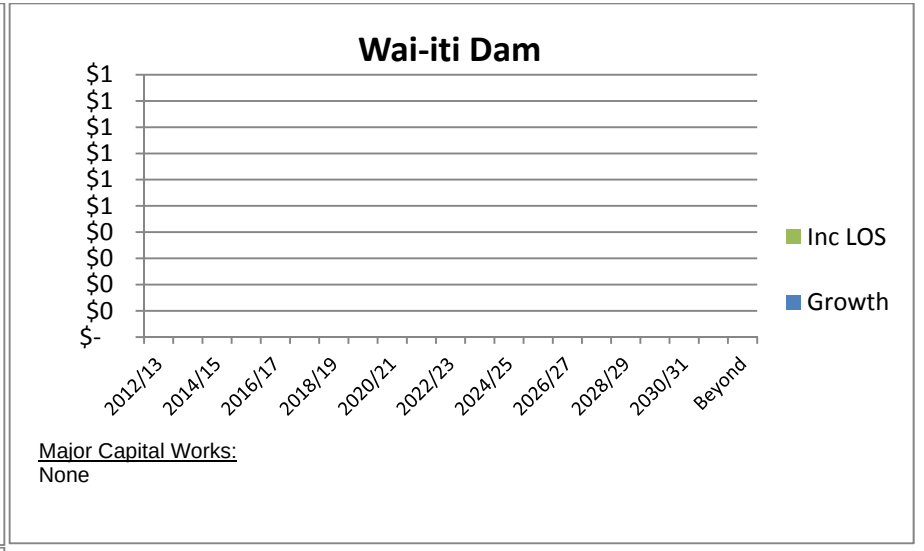


Major Capital Works:
Installation of Household Treatment Units, yrs 2018 - 2019



Major Capital Works:
Treatment Plant Upgrade, yrs 2012 - 2015
New Town Supply, yrs Beyond 2032





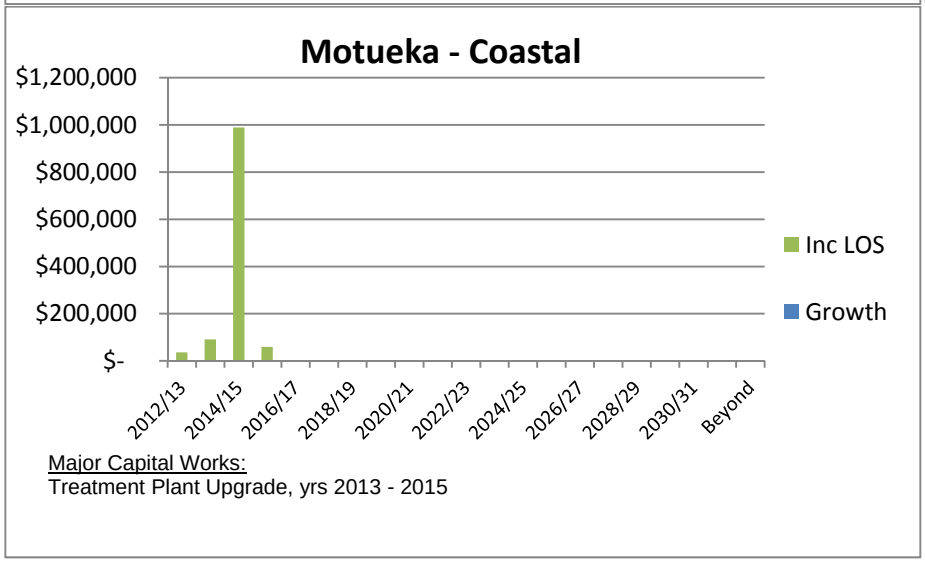


Figure F-3: 2012 – 2032 Water Supply New Capital Expenditure individual Schemes

Table F-8: 2012 – 2032 Water Supply New Capital Expenditure Forecast

Item	Scheme	Project Name	Description	GL Code	Total Project Cost	Total New Capital	2012/13 Year 1	2013/14 Year 2	2014/15 Year 3	2015/16 Year 4	2016/17 Year 5	2017/18 Year 6	2018/19 Year 7	2019/20 Year 8	2020/21 Year 9	2021/22 Year 10	2022/23 Year 11	2023/24 Year 12	2024/25 Year 13	2025/26 Year 14	2026/27 Year 15	2027/28 Year 16	2028/29 Year 17	2029/30 Year 18	2030/31 Year 19	2031/32 Year 20	Beyond Year 20
7	88 Valley	Treatment Upgrade	Upgrade treatment to mitigate risks	8046215005	$667,667	$667,667	$10,015														$90,135	$567,517					
11	Brightwater	Factory Road main	Replace 660m of 100mm AC main with	8156215004	$386,100	$21,700						$21,700															
14	Brightwater	SH6main replace,RanzRd-3Brothr	Replace 1525m of 150mm AC main with	8156215010	$706,948	$217,148									$43,430	$173,718											
15	Brightwater	Supplementary Bore		8156215002	$203,000	$203,000											$20,300	$182,700									
16	Brightwater	Teapot Valley extension	2390m of 63mm pipeline along Waimea	8156215007	$147,581	$147,581							$147,581														
18	Brightwater	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	8156215008	$913,000	$913,000					$45,650	$91,300	$776,050														
23	Collingwood	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	8226215004	$573,200	$573,200				$85,980	$487,220																
31	Dovedale	New Mot River Valley Water Supp	Wells, headworks, pump station, treatment	8056215004	$1,679,013	$1,679,013	$8,395														$327,408	$1,343,210					
43	Hamama	Install Household T/ment Units	Install household treatment units in each	8076215001	$139,600	$139,600	$13,960						$125,640														
51	Kaiteriteri/Riwaka	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	8236215005	$843,400	$843,400	$54,821			$84,340	$704,239																
55	Mapua/Ruby Bay	CTA/Coastal Pipeline - Component	CTA/Coastal Pipeline - Component for	8146215005	$14,402,519	$14,402,519						$736,562	$4,133,584	$5,550,782	$3,103,154	$133,587	$389,278	$8,174	$40,834	$41,604	$36,240	$12,310	$52,828	$39,893	$58,824	$21,421	$43,445
61	Mapua/Ruby Bay	R3 CTA/Coastal Pipeline - Compor	CTA/Coastal Pipeline - Component for	8146215004	$11,885,961	$11,885,961						$177,348	$836,406	$993,498	$616,086	$1,417,928	$2,274,067	$128,066	$639,726	$651,796	$567,760	$192,850	$827,632	$624,987	$921,576	$335,599	$680,635
63	Marahau	New town supply	Construct new water supply	8136215001	$1,145,631	$1,145,631																					$1,145,631
69	Motueka - Plains	Motueka New Town Supply - Comp	Motueka New Town Supply - Component	8146215006	$822,493	$822,493									$33,745	$304,845	$238,953	$244,950									
70	Motueka - Coastal	Motueka Existing Supply - Treatme	Motueka Existing Supply - Treatment	8026215017	$1,080,520	$1,080,520		$91,200	$989,320																		
71	Motueka - Plains	Motueka New Town Supply - Comp	Motueka New Town Supply - Component	8146215002	$6,087,545	$6,087,545									$249,758	$2,256,260	$1,768,571	$1,812,957									
72	Motueka - Plains	Motueka New Town Supply - Comp	Motueka New Town Supply - Component	8146215003	$2,998,343	$2,998,343									$123,015	$1,111,292	$871,087	$892,949									
75	Motueka - Coastal	Naumai Street	Extending main to create a loop	8026215013	$59,300	$59,300				$59,300																	
76	Motueka - Plains	R3 Motueka New Town Supply - C	Motueka New Town Supply - Component	8146215001	$2,467,479	$2,467,479									$101,235	$914,535	$716,859	$734,850									
87	Murchison	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	8176215001	$584,400	$584,400	$58,440	$525,960																			
89	Pohara	Construct New Town Supply	Construct new water supply serving	8576215003	$10,353,000	$10,353,000																					$10,353,000
92	Pohara	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	8576215002	$438,200	$438,200	$81,730		$356,470																		
104	Redwoods Valley	Treatment Upgrade-Golden Hills	Upgrade treatment to meet DWSNZ.	8066215013	$396,865	$396,865	$5,159														$39,687	$352,019					
105	Redwoods Valley	Treatment Upgrade-O'Connor Ck	Upgrade treatment to meet DWSNZ.	8066215014	$478,167	$478,167	$6,216														$47,817	$424,134					
108	Richmond	Bateup Road/Wensley Road Roun	40mm rider main to be transferred to	8016215066	$42,900	$42,900	$42,900																				
110	Richmond	Re-zoning - Cambridge St and We	Upsize mains to 150mm between Queen	8016215068	$287,900	$287,900				$287,900																	
118	Richmond	Gladstone Road	New 250mm main from Queen St to Three	8016215071	$1,522,000	$1,522,000														$76,100	$1,445,900						
119	Richmond	Growth Allowance for pipelines	Allowance to increase pipelines due to	8016215072	$500,000	$500,000		$100,000				$100,000				$100,000				$100,000			$100,000				
120	Richmond	Re-zoning - Hi Level Vahalla	Upgrade pipe to 200mm from Reservoir	8016215073	$145,900	$145,900		$145,900																			
123	Richmond	Lower Queen St	Replace existing 100 main with 150mm	8016215075	$783,400	$73,000				$7,300	$65,700																
125	Richmond	New Groundwater Source	New Wellfield and new main to Richmond	8016215035	$4,272,440	$4,272,440	$9,827	$9,827	$9,827	$9,827	$9,827	$9,827	$9,827	$9,827	$9,827	$9,827	$8,545	$534,055	$1,495,354	$2,136,220							
126	Richmond	Oxford Street Main replacement	Wensley Road - Gladstone Road, replace	8016215023	$290,087	$290,087											$58,017	$232,070									
127	Richmond	Patons Road	Link Line on Patons Road between Rams	8016215076	$85,300	$85,300				$85,300																	
129	Richmond	Queen St Watermain replacement	Replacing all existing 300mm and 100mm	8016215009	$1,881,500	$274,800			$27,480	$123,660	$123,660																
132	Richmond	R/S Ris/Main/Pump Stn-LL-HL Res	New Rising main and pump station from	8016215018	$857,066	$857,066																					$857,066
133	Richmond	R/S Ris/Main-LowQnSt-LowLvl Res	300mm trunk main from new WTP to	8016215017	$2,289,536	$2,289,536																					$2,289,536
134	Richmond	R/S-Ris/Main-HL Resvr-Heights Re	New rising main and pump station from	8016215019	$572,359	$572,359																					$572,359
135	Richmond	Replace Waverly Street Main	Wensley Road - Gladstone Road, replace	8016215024	$243,194	$243,194								$48,639	$194,555												
136	Richmond	Reservoir Seismic Remediation	Strengthen of Reservoirs	8016215078	$260,000	$260,000	$260,000																				
138	Richmond	Re-zoning McGlashen Ave	New 150mm main down McGlashen Ave	8016215093	$340,981	$340,981					$340,981																
140	Richmond	Re-zoning - Talbot St	Upgrade the existing 100mm diameter	8016215081	$226,000	$226,000		$226,000																			
141	Richmond	Rezoning -William Street and Gilb	New 150mm main in William Street,	8016215025	$767,400	$767,400			$767,400																		
142	Richmond	Rich East-Hghts Rising Main&PS	Rising main and pump station from	8016215016	$741,000	$741,000					$74,100					$74,100	$592,800										
144	Richmond	Rich South - HL Hill St South	Upsize 1230m of 50mm to 150mm along	8016215022	$462,942	$462,942																					$462,942
145	Richmond	Rich Sth - HL Paton Road Main	New 150mm high level main from Hart	8016215020	$308,865	$308,865																					$308,865
146	Richmond	Rich Sth - LL Paton Road Main	New 150mm low level main from end of	8016215021	$431,274	$431,274																					$431,274
148	Richmond	Rich Sth-Hill Plough-Hill St	New 150mm main along Hill Street from	8016215030	$881,832	$881,832																					$881,832
150	Richmond	Richmond East - Reservoir and Pip	Additional funds for Reservoir, rising main	8016215033	$1,200,000	$1,200,000	$1,200,000																				
151	Richmond	Richmond East-Heights Reservoir	Construct new reservoir - 150m3.	8016215014	$380,000	$380,000		$57,000								$38,000	$285,000										
153	Richmond	Richmond Sth-Heights Reservoir	Construct new reservoir - 100m3	8016215012	$301,354	$301,354																					$301,354
154	Richmond	Richmond Sth-High Lvl Reservoir	Construct new high level reservoir - 650m3	8016215011	$1,056,108	$1,056,108																					$1,056,108
155	Richmond	Richmond Sth-Low Lvl Reservoir	Construct new low level reservoir -	8016215010	$2,161,747	$2,161,747																					$2,161,747
156	Richmond	Richmond Water Treatment Plant	Mixing, UV, pH correction of combined	8016215034	$8,650,000	$8,650,000	$850,000	$3,892,500	$3,907,500																		
159	Richmond	Telemetry Upgrade	New Control Panels and telemetry and	8016215059	$3,367,000	$1,919,190	$95,960	$95,960	$95,960	$95,960	$95,960	$70,050	$61,414	$61,414	$61,414	$61,414	$163,131	$163,131	$163,131	$61,414	$61,414	$61,414	$61,414	$62,374	$163,131	$163,131	
184	Wakefield	New Source Construction	New Bore field and treatment plant in	8216215006	$4,368,500	$4,368,500	$87,370	$87,370		$436,850	$3,756,910																
189	Wakefield	Wakefd&88 Valley Wat Supp Upgr	Rezoning, new reservoirs and mains for 88	8216215001	$2,529,177	$2,529,177		$101,167								$379,377	$2,048,633										
194	Richmond	Backflow Prevention	Installation of backflow preventions at key	8016215087	$632,000	$632,000	$176,012	$183,975	$134,995	$137,018																	
198	Redwoods Valley	Treatment Sites - UVT Monitors	Installing UVT monitors	8066215022	$53,500	$53,500				$53,500																	
199	Murchison	Treatment Site - UVT Monitor	Installing UVT monitor	8176215014	$20,000	$20,000	$20,000																				
200	Motueka - Coastal	Treatment Sites - UVT Monitors	Installing UVT monitors	8026215015	$36,000	$36,000	$36,000																				
201	Collingwood	Treatment Site - UVT Monitor	Installing UVT monitor, turbidity meter	8226215005	$30,000	$30,000	$30,000																				
202	88 Valley	Treatment Site - UVT Monitor	Installing UVT monitor	8046215020	$18,500	$18,500			$18,500																		
203	Kaiteriteri/Riwaka	Treatment Site	Installing conductivity meter, pH and	8236215006	$25,000	$25,000	$25,000																				
207	Richmond	Re-zoning - Edward, Roeske Wilke	Upgrading Edward St, Roeske St and	8016215088	$1,009,100	$254,618							$25,462	$50,924	$178,233												
208	Richmond	Re-zoning Salisbury Road	Upgrade main to 200mm	8016215089	$253,000	$253,000																					$253,000
209	Richmond	Lower Queen St Trunkmain	Upgrade main to 400mm	8016215090	$1,500,000	$1,500,000																					$1,500,000
210	Motueka - Plains	Motueka New Town Supply - Gove	Government Subsidy	8146215008	$4,074,000	$4,074,000									$167,147	$1,509,969	$1,183,590	$1,213,295									
211	Richmond	Bulk Meter Supply	Bulk Meter Supply	8016215091	$3,500	$3,500		$3,500																			
212	Brightwater	Bulk Meter Supply	Bulk Meter Supply	8156215022	$18,000	$18,000	$18,000																				
213	Mapua/Ruby Bay	Bulk Meter Supply	Bulk Meter Supply	8156215003	$8,800	$8,800	$8,800																				
214	Wakefield	Bulk Meter Supply	Bulk Meter Supply	8216215021	$3,000	$3,000		$3,000																			
215	Redwoods Valley	Bulk Meter Supply	Bulk Meter Supply	8066215023	$13,500	$13,500	$13,500																				
216	88 Valley	Bulk Meter Supply	Bulk Meter Supply	8046215021	$3,000	$3,000	$3,000																				
231	Motueka - Plains	Relocate Fearons Bush WTP to Pa	Relocate Fearons Bush WTP to Parkers		$375,000	$225,000						$225,000															
				TOTALS	**$142,172,644**	**$104,219,997**	**$3,115,105**	**$5,523,358**	**$6,307,451**	**$1,466,934**	**$5,704,246**	**$1,431,787**	**$6,115,964**	**$6,715,083**	**$4,881,598**	**$8,484,851**	**$10,618,832**	**$6,147,196**	**$2,339,045**	**$3,067,134**	**$2,616,360**	**$2,953,454**	**$1,041,874**	**$727,254**	**$1,143,531**	**$520,151**	**$23,298,790**

Note: Does not include inflation

APPENDIX G. DEVELOPMENT CONTRIBUTIONS / FINANCIAL CONTRIBUTIONS

Information on Council's Development Contribution Policy can be found in Part 5 of the Long Term Plan (LTP). The Policy is adopted in conjunction with the LTP and will come into effect on 1 July 2012.

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

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

There is one Water Development Contribution in place (as shown in Table G-1 below).

Table G-1: Current Development Contributions

Activity	Development Contribution per HUD $ (incl GST)*
Water	$6,596
Wastewater	$8,118
Transportation	$894
Stormwater	$5,149
TOTAL	$20,756

HUD = Household Unit of Demand

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

A forecast of the income from Water Development Contributions expected over the 10 year period of the Long Term Plan has been prepared by Council's Corporate Services based on the forecast residential and business growth projections of the Growth Demand and Supply Model (GDSM – refer Appendix F). The forecast income is included as a line item in the Cost of Service Statement included in Appendix L.

APPENDIX H. RESOURCE CONSENTS AND PROPERTY DESIGNATIONS

H.1 Introduction

The statutory framework defining what activities require resource consents is the Resource Management Act (RMA) 1991. The RMA deals with:

- the control of the use of land
- structures and works in river beds and in the coastal marine area
- the control of the taking, use, damming and diversion of water and the control of the quantity, level and flow of water in any water body, including:
    - the setting of any maximum or minimum levels or flows of water; and
    - the control of the range, or rate of change, of levels or flows of water.

The RMA is administered locally by Tasman District Council, a Unitary Authority, through the Tasman Resource Management Plan (TRMP) which sets out Policies, Objectives and Rules controlling activities to ensure they meet the Purpose and Principles of the RMA.

An important aspect of the water supply activity is to ensure that all community water takes, whether they be from ground water or surface water, are managed responsibly.

Under the RMA and the TRMP, water permits are required for the volume of water abstractions required for community water supplies. Resource consents may also be required for dams, weirs (and other structures in stream beds), treatment plants and other infrastructure associated with the water supply systems.

Resource consents are in place for all the community water supplies that Council manages. Council has also made an application to increase the water take from the Central Plains aquifer (to secure future domestic supplies for Motueka township and the Coastal Tasman communities) and to take water for a new water supply in Wakefield.

Generally, Council holds resource consents or designations for its water supply activities to the extent required by the RMA and current rules in the TRMP. For some water infrastructure installed prior to the RMA being enacted in 1991, such as pipelines across rivers and streambeds, previous authorisations are relied on.

H.2 Resource Consents

The number and type of resource consents relating to water assets has increased significantly over recent years so a database (NM2) has been developed. NM2 includes a register of all resource consents, active or expired, associated with Council's water systems. Electronic copies of the consents and actions are loaded into the database so they can be tracked and completed. NM2 allows the accurate programming of all actions required by the consents including renewal prior to consent expiry.

A summary of active resource consents held for the water supplies operated by Council is provided in Table H-1. As the TRMP is a living document and subject to change, the list is only accurate at the time of compilation (September 2011).

Table H-1: Schedule of Resource Consents

Scheme	Consent No.	Consent Type	Date Issued	Date Expiry
Brightwater	NN020022	Water take	12/6/2003	31/5/2017
Collingwood	NN020325	Water take	30/10/2002	21/5/2019
Collingwood	RM030480	Land use for water supply structure in a river bed	4/06/2003	31/05/2019
Murchison	RM040976	Water take	11/7/2007	31/5/2020
Richmond	NN960213	Water take	1/9/1998	31/5/2016
Redwood Valley 1 and 2 RWS[1] - River Road	RM110193	Water take	15/7/2011	31/5/2017
Redwood Valley 2 RWS[1] – O'Conner Creek	RM110191	Water take	15/7/2011	31/5/2017
Redwood Valley 1 RWS[1] - Golden Hills	NN970139	Water take	11/4/2002	31/5/2017
Redwood RWS[1] – O'Conner Creek	RM041164	Land use for water supply structure in a river bed	4/11/2004	31/5/2028
Pohara	NN720010	Water take	30/4/1996	1/10/2026
Hamama	RM031060	Water take	10/5/2004	31/5/2019[2]
Tapawera	RM040256	Water take	11/8/2004	31/5/2019
Dovedale RWS[1]	RM100114 RM100116 RM100117	Water take Dam a watercourse Land use of a river bed	14/3/2011	31/5/2033[3]
88 Valley RWS[1]	RM100828	Water take	12/12/2010	31/5/2016
88 Valley RWS[1]	RM061023	Land use for water supply structure in a river bed	2/12/2009	30/11/2044
Motueka – Fearon's Bush	NN000256	Water take	10/7/2000	31/5/2015
Motueka – Recreation Centre	NN000254	Water take	23/6/2000	31/5/2015
Torrent Bay[4]	RM040248	Water take	20/8/2004	31/5/2015
Wakefield	NN010213	Water take	1/1/2001	31/5/2016
Upper Takaka	RM100113 RM100120	Water take Land use for water supply structure in a river bed	16/3/2011	31/5/2034
Waimea	RM110192	Water take	15/7/2011	31/5/2017
Waimea (Mapua estuary supply pipeline)	RM060492	Disturb and occupy coastal marine area	27/6/2006	27/6/2041
Waimea (Seaton Valley Stream)	RM070870	Land use for water supply structure in a river bed	3/10/2007	3/10/2042
Kaiteriteri	NN000255	Water take	26/7/2000	31/5/2015

[1] RWS = rural water supply (restricted supply),
[2] Not a Tasman District Council consent (Hamama Water supply committee),
[3]Conditional consent length-to be reviewed in 2017/2018,
[4] Scheme not operated by Tasman District Council

Where permits for discharges, water or coastal activities, or consents for river beds are required, the RMA restricts those consents to a maximum of 35 years only. Hence there needs to be an on-going programme of 'consent renewals' for those components of Council's water supplies, as well as a monitoring programme for compliance with the conditions of permitted activities or resource consents.

Council will ensure that the process / programme for lodging applications for the renewal of resource consents will be undertaken in plenty of time before they expire, and for monitoring and reporting the Council's actual performance against all of the relevant conditions of each consent.

Short-term consents are required from time to time for construction activities.

Generally there is little monitoring of resource consent conditions undertaken at present with the exception of meter reading. Council intend to initiate a more thorough programme of monitoring, including, but not limited to stream flows and instantaneous scheme take rates.

H.3 Resource Consent Reporting and Monitoring

Council aims to achieve minimum compliance with all consents and / or operating conditions. The achievement of water activities to meet consent requirements is reported on in a number of different ways as detailed below.

H.3.1. Environmental Reporting and Monitoring

Environmental monitoring conditions are reported on quarterly, six monthly and / or annual as determined by the consent conditions. Any non-compliance incidents are recorded, notified to Council's Compliance Officer, and mitigation measures put in place to minimise any potential impacts.

H.3.2. NM2

MWH New Zealand Ltd has developed a database (NM2) of all refuse, roading, stormwater, water, and wastewater resource consents. The management of this database allows the accurate programming of all actions required by the consents including renewal prior to consent expiry. NM2 is actively updated to ensure all consent conditions are complied with and that all relevant reporting requirements are adhered to.

H.3.3. KPI Inspections

Monthly site inspections are undertaken by MWH New Zealand Ltd at each site as part of C688. During these site investigations the performance of the contractor and the general compliance of the site is measured against a number of Key Performance Indicators (KPI's). These assessments are provided to Council on a monthly basis.

H.3.4. Council Annual Report

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

A summary of how Council is performing against this Level of service is also provided in Appendix R.

H.3.5. State of the Environment Report

As part of its obligations under the RMA, the Council monitors the state of surface water quality and river health at sites throughout the district.

A report titled *River Water Quality in Tasman District 2010* was jointly produced by the Cawthron Institute (Report Ref. 1893) and Tasman District Council (Report Ref. R10001). This report is also available on the Council's website (www.tasman.govt.nz).

H.4 Property Designations

Designations are another way provided by the RMA of identifying and protecting lands for existing and public works. Council has designated 30 sites for various public water supply purposes in the TRMP, mainly existing water reservoirs and pump stations; these are detailed in Table H-2 below:

Table H-2: Summary of Water Supply Designations

ID	Location	Site Name/Function	Purpose of Designation
Existing			
D170	87 Queen Street, Richmond	Queen Street Reservoir and Pump Station	Public Water Supply Purposes
D171	11 Valhalla Lane, Richmond	Valhalla Lane High Level Reservoir	Public Water Supply Purposes
D172	132 Edward Street Wakefield	Wakefield Reservoir	Public Water Supply Purposes
D173	92 Fairfax Street, Murchison	Murchison Pump Station	Public Water Supply Purposes
D174	Chalgrave Street, Murchison	Murchison Reservoir	Public Water Supply Purposes
D175	Hamama Road	Hamama Water Supply Intake	Public Water Supply Purposes
New			
D184	Pomona Road, Ruby Bay	Pomona Road Reservoir and Pump Station	Public Water Supply Purposes
D185	Brabant Dr, Ruby Bay	Brabant Drive Reservoir and Pump Station	Public Water Supply Purposes
D186	Lightband Road, Brightwater	Brightwater Pump Station	Public Water Supply Purposes
D187	Lord Rutherford Road South, Brightwater	Brightwater Reservoir	Public Water Supply Purposes
D188	Pigeon Valley Road, Wakefield	Wakefield Pump Station and well	Public Water Supply Purposes
D189	45 Vahalla Drive, Richmond	Valhalla Drive Extra High Level Reservoir	Public Water Supply Purposes
D190	11 Cropp Place, Richmond	Cropp Place High Level Reservoir	Public Water Supply Purposes
D191	Lower Queen Street, Appleby	Waimea Pump Station	Public Water Supply Purposes
D192	Tapawera – Glenhope Road, Tapawera	Tapawera Pump Station	Public Water Supply Purposes
D193	Totara Street, Tapawera	Tapawera Reservoir	Public Water Supply Purposes
D194	10 Fearon Street, Motueka	Fearon's Bush Pump Station	Public Water Supply Purposes
D195	Old Wharf Road, Motueka	Recreation Centre Pump Station	Public Water Supply Purposes
D196	Unnamed Stream, Torrent Bay	Torrent Bay Water Supply Intake	Public Water Supply Purposes
D197	Golden Hills Road	Redwood Valley No.1 Pump Station	Public Water Supply Purposes

ID	Location	Site Name/Function	Purpose of Designation
D198	O'Connor's Creek SH60	Redwood Valley No.2 Pump Station	Public Water Supply Purposes
D199	Haile Lane, Pohara	Pohara Valley Water Supply Intake	Public Water Supply Purposes
D200	Haile Lane, Pohara	Pohara Valley Pump Station	Public Water Supply Purposes
D201	Pohara Valley Road	Pohara Valley Reservoir	Public Water Supply Purposes
D202	Lower Queen Street	Neimans Creek PS	Public Water Supply Purposes
D205	State Highway 60, Upper Takaka	Upper Takaka Reservoir	Public Water Supply Purposes
D206	State Highway 60, Takaka Hill	Upper Takaka Water Supply Intake	Public Water Supply Purposes
D236	226 Champion Road, Richmond	Waimea Reservoir and Pump Station	Public Water Supply Purposes
D244	Lower Queen Street and McShane Road, Richmond	Water Treatment and Wastewater Pump Station	Public Water Supply and wastewater disposal
D245	McShane Road, Richmond	Water Wells	Public Water Supply

All designations have a duration of five years, with the exception of the designations with the following ID numbers, D170, D171, D172, D173 and D236.

A full schedule of existing designations for the water activity is included in Appendix 1 of Part II of the Tasman Resource Management Plan.

APPENDIX I. CAPITAL REQUIREMENTS FOR FUTURE RENEWALS

I.1 Introduction

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

I.2 Renewal Strategy

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of critical assets is sufficiently high.

The renewal programme has been developed by the following.

- Taking asset age and remaining life predictions from Confirm, calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs.
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and asset management staff. This incorporates the knowledge gained from tracking asset failures through the Customer Services System, the GPS locating of pipe breaks and overflows, and contract reporting structures.
- Undertaking an optimising review to identify opportunities for bundling projects across assets, optimised replacement, timing across assets – especially between pipe upgrades and roading works, and smoothing of expenditure.

The renewal programme is reviewed in detail at each AMP (ie. three yearly), and every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

I.3 Delivery of Renewals

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

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

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

The renewal of assets including all the mechanical, electrical, and small scale civil renewal works which were identified from the Asset Valuations. These assets and associated timings and costs were transferred into the AMPs. To smooth the expenditure profile the timing of some of these assets have been deferred and grouped together in a logical manner, to minimise the cost of the renewal. Prior to the asset being renewed, the operations and maintenance contractor will inspect these assets to confirm whether renewal is actually necessary. In the event it does not need to be renewed, a recommended date of renewal is then inputted back into the Confirm database. This new date will then be included in the next AMP update.

I.4 Renewal Standards

The work to be performed and materials to be used shall comply with the current Council Engineering Standards.

I.5 Deferred Renewals

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

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

MWH have prepared a draft renewals strategy for Council which is summarised below. For further information refer to Tasman District Water Pipeline Renewals Strategy Draft Report – October 2011.

I.5.1. Assessment of Deferred Renewals

Figure I – 1 shows a comparison of the amount being spent on renewals with the amount of depreciation recognised annually. If the renewals expenditure starts falling behind the accumulative depreciation then the asset are not being replaced or renewed at the rate at which they are being consumed. If this continues unchecked for too long, future communities will inherit a run-down asset, high maintenance costs and high capital costs to renew failing infrastructure.

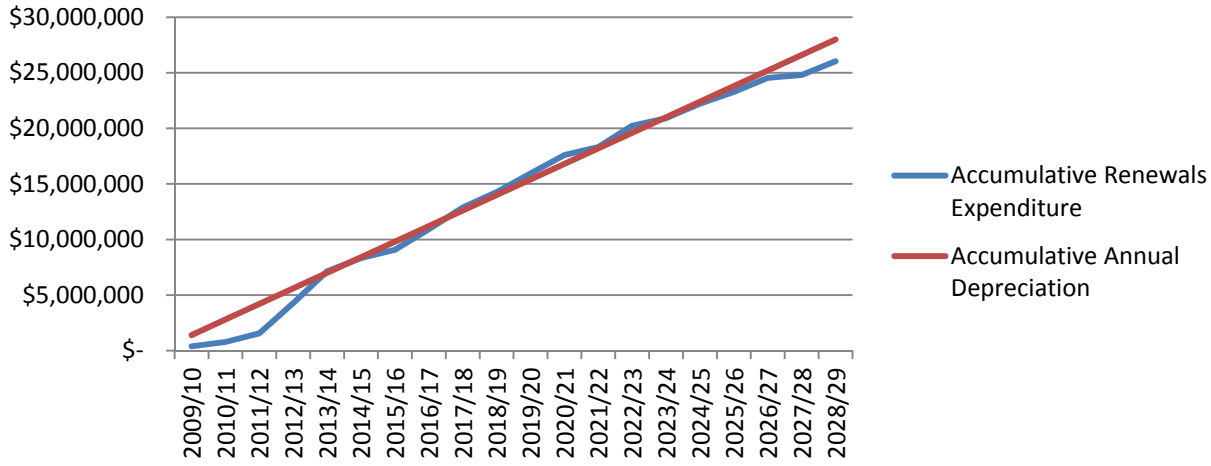


Figure I-1: Comparison of Accumulative Renewals Expenditure vs Annual Depreciation

Figure I-1 shows Council is investing in renewals at a rate that matches depreciation so the asset is not being consumed.

I.5.2. Management and Mitigation of Renewals

To improve the information base for the renewals strategy and replacement programme, Council plans to focus on the following improvements:

- more critically assessing remaining life of pipelines with known condition problems
- capturing asset data to reduce the high level of “unknown” pipelines
- using a risk based approach to identifying pipeline replacement programmes
- improving condition knowledge of some of the “high risk” pipelines, especially to identify:
    - asset condition may be worse than expected
    - situations where remaining life is under-estimated.

I.6 Forecast of Renewals Expenditure for Next 20 years

Tables showing a summary and total breakdown of the expenditure forecast for renewals over the next 20 years are provided in Figure I-2. The expenditure is detailed scheme by scheme.

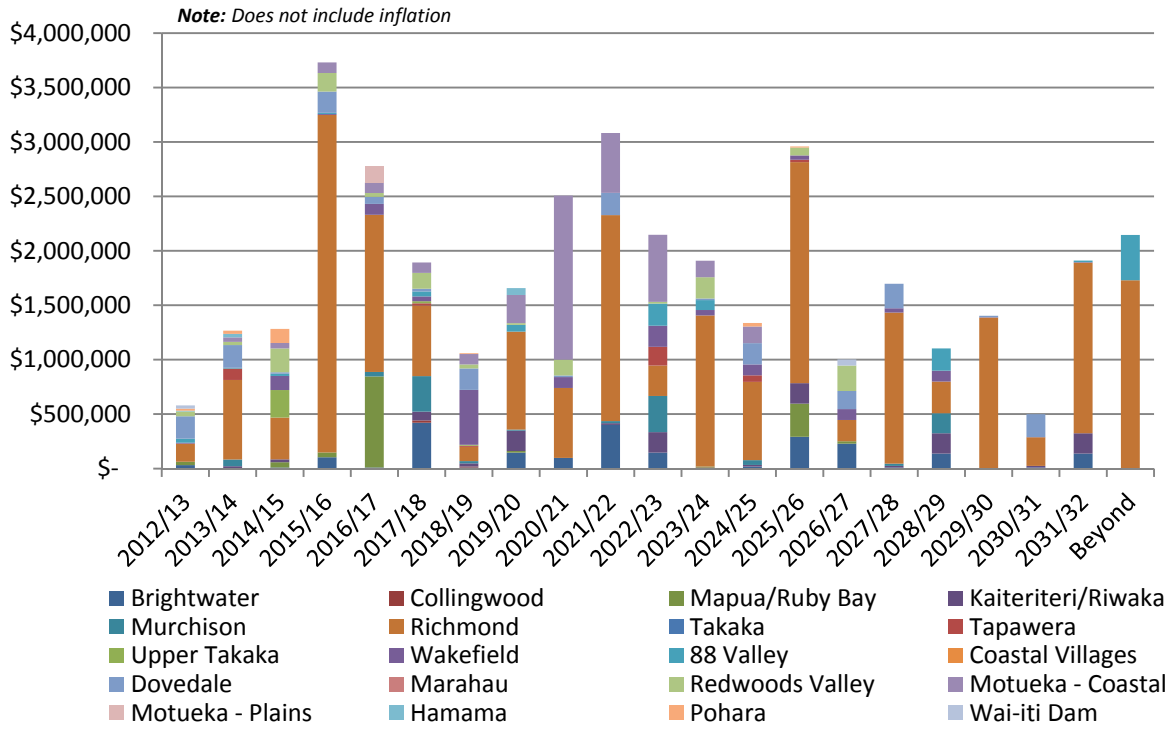


Figure I-2: 2012 – 2032 Water Supply Renewals Expenditure Forecast

Table I-1: 2012 – 2032 Water Supply Renewals Expenditure Forecast

Item	Scheme	Project Name	Description	GL Code	Total Project Cost	Total Renewals	2012/13 Year 1	2013/14 Year 2	2014/15 Year 3	2015/16 Year 4	2016/17 Year 5	2017/18 Year 6	2018/19 Year 7	2019/20 Year 8	2020/21 Year 9	2021/22 Year 10	2022/23 Year 11	2023/24 Year 12	2024/25 Year 13	2025/26 Year 14	2026/27 Year 15	2027/28 Year 16	2028/29 Year 17	2029/30 Year 18	2030/31 Year 19	2031/32 Year 20	Beyond Year 20
1	88 Valley	88 Valley Pipeline Renewals		8046215006	$913,500	$913,500						$45,675		$16,748			$202,797						$203,711				$415,643
2	88 Valley	88 Valley Reservoirs	Replacing Electrical, Flowmeter	8046215009	$16,748	$16,748																					
4	88 Valley	Intake access & pipeline renewal	Replace the top end of the main and upgrade t	8046215003	$90,538	$90,538												$90,538									
5	88 Valley	Restrictor Renewals	Restrictor Renewals	8046215011	$36,743	$36,743	$36,743																				
6	88 Valley	River Terrace Road	Replacing Flowmeter	8046215012	$7,105	$7,105		$7,105																			
8	Brightwater	Brightwater Main Water PS and WT	Replacing Chlorinator, Contact tank, Flowmete	8156215014	$83,484	$83,484				$83,484																	
9	Brightwater	Brightwater Pipeline Renewals		8156215011	$913,500	$913,500							$9,135	$146,160		$9,135	$146,160		$18,270	$292,320		$9,135	$137,025		$9,135	$137,025	
10	Brightwater	Brightwater Well Field	Replacing Pumps, Well Head	8156215019	$31,973	$31,973	$31,973																				
11	Brightwater	Factory Road main	Replace 660m of 100mm AC main with 150mm	8156215004	$386,100	$364,400						$364,400															
12	Brightwater	Fire Hydrant Renewal	Fire Hydrant Renewals	8156215012	$158,340	$158,340															$158,340						
13	Brightwater	Restrictor Renewals	Restrictor Renewals	8156215020	$57,652	$57,652						$57,652															
14	Brightwater	SH6main replace,RanzRd-3Brothr	Replace 1525m of 150mm AC main with 200m	8156215010	$706,948	$489,800									$97,960	$391,840											
17	Brightwater	Teapot Valley PS	Replacing Pressure Gauge, Pump	8156215021	$10,658	$10,658		$1,523	$9,135																		
19	Brightwater	Valve Renewals	Valve Renewals	8156215018	$71,082	$71,082															$71,082						
20	Collingwood	Collingwood Bore Site	Replacing Pump	8226215001	$9,135	$9,135												$9,135									
24	Dovedale	Bensemann's BP Tank	Replacing Break pressure tank	8056215005	$50,750	$50,750															$50,750						
25	Dovedale	Beuke's BP Tank	Replacing Break pressure tank	8056215006	$30,450	$30,450															$30,450						
26	Dovedale	Cozens Valley BP Tank - Sunday G	Replacing Break pressure tank	8056215022	$10,150	$10,150															$10,150						
27	Dovedale	Dovedale Pipeline Renewals		8056215003	$1,400,000	$1,400,000	$126,000		$14,000	$196,000		$14,000	$196,000		$14,000	$196,000		$14,000	$196,000		$14,000	$196,000		$14,000	$210,000		
28	Dovedale	Fire Hydrant Renewal	Fire Hydrant Renewals	8056215023	$6,090	$6,090															$6,090						
29	Dovedale	Knotts Water PS	Replacing Flowmeter, Pressure cylinder, Pump	8056215009	$50,750	$50,750					$43,645					$7,105											
30	Dovedale	Neudorf Saddle BP Tank	Replacing Break pressure tank	8056215011	$20,300	$20,300															$20,300						
32	Dovedale	Restrictor Renewals	Restrictor Renewals	8056215012	$59,682	$59,682	$59,682																				
33	Dovedale	Rosedale Saddle BP Tank	Replacing Break pressure tank	8056215013	$10,150	$10,150															$10,150						
34	Dovedale	Source Treatment Plant - Humphri	Replacing Grit chamber, Chlorinator, Pump	8056215008	$61,103	$61,103		$33,607														$27,496					
36	Dovedale	Te Hepe Lower PS	Replacing Pressure cylinder, Pumps	8056215015	$43,645	$43,645		$43,645																			
37	Dovedale	Te Hepe Top PS	Replacing Pressure cylinder, Pumps	8056215016	$43,645	$43,645		$43,645																			
38	Dovedale	Thorns Water PS	Replacing Pressure cylinder, Pumps	8056215017	$43,645	$43,645		$43,645																			
39	Dovedale	Valve Renewals	Valve Renewals	8056215018	$25,574	$25,574															$24,052	$1,523					
40	Dovedale	Wins Water PS - Win Valley Road	Replacing Pressure cylinder, Pumps	8056215019	$43,645	$43,645		$43,645																			
41	88 Valley	Valve Renewals	Valve Renewals	8046215019	$14,780	$14,780																				$14,780	
42	Hamama	Hamama Reservoir	Replacing Strainer, Settlement tank	8076215002	$23,233	$23,233		$23,233																			
44	Hamama	Pipeline Renewals	Pipeline Renewals	8076215004	$62,687	$62,687								$62,687													
45	Hamama	Restrictor Renewals	Restrictor Renewals	8076215005	$7,308	$7,308	$7,308																				
46	Hamama	Valve Renewals	Valve Renewals	8076215003	$8,734	$8,734		$8,734																			
47	Kaiteriteri/Riwaka	Kaiteriteri lower booster water PS	Replacing Control panel, Electrical, Flowmeter,	8236215001	$81,200	$81,200						$81,200															
48	Kaiteriteri/Riwaka	Kaiteriteri Pipeline Renewals		8236215002	$1,015,000	$1,015,000							$15,225	$187,775		$15,225	$187,775		$15,225	$187,775		$15,225	$187,775		$15,225	$187,775	
49	Kaiteriteri/Riwaka	Kaiteriteri upper booster water PS	Replacing Electrical, Pump	8236215003	$14,210	$14,210							$14,210														
50	Kaiteriteri/Riwaka	Kaiteriteri Well - 33 River Road	Replacing Flowmeter, Pump	8236215004	$16,240	$16,240			$16,240																		
52	Mapua/Ruby Bay	Restrictor Renewals	Restrictor Renewals	8166215044	$49,735	$49,735			$49,735																		
53	Mapua/Ruby Bay	Aranui Road main replacement	Tie in with Wastewater	8166215035	$880,709	$880,709				$44,035	$836,674																
54	Mapua/Ruby Bay	Brabant Drive Booster PS - 22 Brat	Replacing Pressure gauge, Pump	8166215038	$12,180	$12,180	$12,180																				
56	Mapua/Ruby Bay	Mapua Pipeline Renewals		8166215036	$304,500	$304,500														$304,500							
58	Mapua/Ruby Bay	Pine Hill Reservoir PS	Replacing Pumps	8166215041	$18,270	$18,270	$9,135														$9,135						
59	Mapua/Ruby Bay	Pomona Road Reservoir	Replacing Flowmeter	8166215042	$14,210	$14,210								$14,210													
60	Mapua/Ruby Bay	Pomona Road Reservoir PS	Replacing Pumps, Electrical	8166215001	$20,808	$20,808	$9,135														$11,673						
62	Mapua/Ruby Bay	Stafford Drive	Replacing Flowmeter, Pressure gauge	8166215002	$8,628	$8,628												$8,628									
65	Motueka - Coastal	Fearon street mains replacement -	Main needs to be lowered, currently has 480mm	8026215012	$685,000	$685,000										$68,500	$616,500										
66	Motueka - Coastal	Fearons Bush Pump Station - Coas	Replacing Flowmeter, Generator, Pressure cyli	8026215008	$128,905	$128,905			$41,250							$87,655											
68	Motueka - Coastal	High Street South main renewal - C	Replace Class B 200mm main along High St, S	8026215002	$401,534	$401,534									$40,153	$361,381											
73	Motueka - Coastal	Motueka Pipeline Renewals		8026215005	$304,500	$304,500												$152,250	$152,250								
74	Motueka - Coastal	Motueka Recreation Centre Water	Replacing Chamber, Flowmeter, Generator, Pr	8026215010	$53,247	$53,247		$20,766								$32,481											
78	Motueka - Coastal	Thorpe Street replacement	Main needs to be lowered, currently has 480mm	8026215014	$1,629,200	$1,629,200								$162,920	$1,466,280												
79	Murchison	92 Fairfax Street Headworks	Replacing Electrical box	8176215006	$36,540	$36,540		$36,540																			
80	Murchison	92 Fairfax Street Main PS and WTI	Replacing Aeration tower, Chlorinator, Contact	8176215005	$69,250	$69,250		$24,861											$44,390								
81	Murchison	Canton Road	Replacing Flowmeter	8176215010	$7,105	$7,105											$7,105										
82	Murchison	Chalgrave St Reservoir	Replacing Valve chamber, Flowmeter	8176215007	$30,369	$30,369											$30,369										
83	Murchison	Fire Hydrant Renewal	Fire Hydrant Renewals	8176215011	$69,717	$69,717											$69,717										
84	Murchison	Murchison Pipeline Renewals		8176215003	$609,000	$609,000					$20,706	$182,700				$20,097	$182,700					$20,097	$182,700				
86	Murchison	Ridermain Improvements		8176215012	$162,500	$162,500					$19,500	$143,000															
88	Murchison	Valve Renewals	Valve Renewals	8176215013	$43,118	$43,118											$43,118										
90	Pohara	Intake-T/ment Plant main replacem	Replace pipe from intake to treatment plant. Lir	8576215001	$122,300	$122,300			$122,300																		
91	Pohara	Pohara Valley WTP and PS	Replacing Chlorinator, Contact tank, Flowmete	8576215007	$74,457	$74,457	$18,270	$30,000	$5,976				$7,105						$13,106								
93	Redwoods Valley	119 Malling Road BP Tank	Replacing Tank	8066215019	$23,599	$23,599															$23,599						
94	Redwoods Valley	337 Redwood Valley Road BP Tan	Replacing Tanks	8066215020	$47,198	$47,198															$47,198						
95	Redwoods Valley	Golden Hills PS	Replacing Contact tank, Flowmeter, Pump, We	8066215002	$91,517	$91,517		$14,185					$27,364					$49,969									
96	Redwoods Valley	Maisey Road Booster Pump Statio	Replacing Control panel, Pressure cylinder, Pu	8066215008	$80,185	$80,185				$80,185																	
97	Redwoods Valley	O'Connors Creek Pump Station	Replacing Aeration tower, Chlorinator, Contact	8066215004	$107,621	$107,621				$60,376										$47,246							
98	Redwoods Valley	Redwoods #1 Booster Pump Statio	Replacing Pumps	8066215007	$18,270	$18,270							$9,135							$9,135							
99	Redwoods Valley	Restrictor Renewals	Restrictor Renewals	8066215021	$71,862	$71,862			$71,862																		
100	Redwoods Valley	River Road Well Headworks	Replacing Pump	8066215010	$9,135	$9,135					$9,135																
101	Redwoods Valley	Valve Renewals	Valve Renewals	8066215011	$17,021	$17,021															$17,021						
102	Redwoods Valley	Neal Property Pipeline Renewal	Renew 700m of 32mm HDPE with 40mm OD M	8066215012	$44,000	$44,000	$44,000																				
103	Redwoods Valley	Redwoods Pipeline Renewals		8066215017	$812,000	$812,000		$16,240	$146,160		$16,240	$146,160		$16,240	$146,160		$16,240	$146,160		$16,240	$146,160						
109	Richmond	Best Island Flow Meter	Replacing Flowmeter	8016215067	$7,105	$7,105		$7,105																			
111	Richmond	Champion Road Main Reservoir PS	Replacing Electrical, Pump	8016215069	$11,673	$11,673	$11,673																				
112	Richmond	Church St	Watermain Renewal	8016215070	$152,600	$152,600			$15,260	$137,340																	
113	Richmond	Cropp Place Pump Station	Replacing Flowmeter, Pressure cylinder, Pump	8016215040	$50,750	$50,750		$41,615													$9,135						
115	Richmond	Fauchelle Avenue, Darcy St and Fl	Renew 100mm AC main with 100mm PVC. Inc	8016215002	$951,200	$951,200				$951,200																	
116	Richmond	Fire Hydrant Renewal	Fire Hydrant Renewals	8016215041	$637,420	$637,420				$106,449				$106,449			$106,449			$106,449			$105,812			$105,812	
121	Richmond	Hill Street South PS	Replacing Electrical, Flowmeter, Strainer, Pum	8016215043	$34,510	$34,510							$8,628					$25,883									
122	Richmond	Lansdowne Road	Replacing Flowmeter	8016215074	$7,105	$7,105		$7,105																			
123	Richmond	Lower Queen St	Replace existing 100 main with 150mm	8016215075	$783,400	$710,400				$71,040	$639,360																
124	Richmond	Lower Queen St PS Control Buildin	Replacing Flowmeter, Pump	8016215044	$16,240	$16,240	$16,240																				
128	Richmond	Pipeline Renewals	Pipeline Renewals	8016215037	$9,108,518	$9,108,518									$50,097	$1,250,600	$50,097	$455,426	$510,077	$1,252,421	$50,097	$1,251,510	$50,097	$1,250,600	$50,097	$1,247,867	$1,639,533
129	Richmond	Queen St Watermain replacement	Replacing all existing 300mm and 100mm in Q	8016215009	$1,881,500	$1,606,700			$160,670	$723,015	$723,015																
130	Richmond	Queen Street Main Reservoir PS	Replacing Valve chamber, Electrical, Miscellan	8016215046	$98,008	$98,008			$79,583						$18,426												
131	Richmond	Queen St Salisbury Rd Intersection	New alignment due to changes at road junction	8016215077	$248,900	$248,900			$24,890	$224,010																	
137	Richmond	Restrictor Renewals	Restrictor Renewals	8016215079	$6,496	$6,496	$6,496																				
152	Richmond	Richmond No1 Well -Queen Street	Replacing Flowmeter	8016215082	$7,105	$7,105		$7,105																			
157	Richmond	Richmond Wells - Lower Queen St	Replacing Well housing, Pump	8016215083	$44,660	$44,660	$44,660																				
158	Richmond	Ridermain Improvements		8016215084	$534,600	$534,600														$534,600							
159	Richmond	Telemetry Upgrade	New Control Panels and telemetry and renewal	8016215059	$3,367,000	$1,447,810	$72,391	$72,391	$72,391	$72,391	$72,391	$52,845	$46,330	$46,330	$46,330	$46,330	$123,064	$123,064	$123,064	$46,330	$46,330	$46,330	$46,330	$47,054	$123,064	$123,064	
160	Richmond	Valhalla Booster PS	Replacing Electrical, Pump	8016215049	$24,360	$24,360	$15,225											$9,135									
161	Richmond	Valve Renewals	Valve Renewals	8016215051	$358,608	$358,608				$179,304								$179,304									
169	Tapawera	Fire Hydrant Renewal	Fire Hydrant Renewals	8186215004	$44,660	$44,660											$22,330			$22,330							
172	Tapawera	Tapawera Pipeline Renewals		8186215002	$150,000	$150,000											$150,000										
174	Tapawera	Tapawera Water Treatment Plant	Replacing Chlorinator, Contact tank, Flowmete	8186215003	$141,372	$141,372		$104,474											$36,898								
175	Tapawera	Valve Renewals	Valve Renewals	8186215007	$23,801	$23,801													$23,801								
177	Upper Takaka	Upper Takaka Pipeline Renewals a		8196215003	$253,750	$253,750			$253,750																		
179	Wai-iti Dam	Wai-iti Dam - Wai-iti Valley	Replacing Monitoring System and Environment	8096215002	$86,641	$86,641	$30,004														$56,637						
180	Wakefield	Ridermain Improvements		8216215019	$441,500	$441,500						$44,150	$397,350														
181	Wakefield	Bird Road Booster PS	Replacing Pump	8216215009	$9,135	$9,135			$9,135																		
182	Wakefield	Fire Hydrant Renewal	Fire Hydrant Renewals	8216215011	$110,317	$110,317											$48,720			$39,267		$14,210		$2,030	$2,030	$4,060	
183	Wakefield	Higgins Road	Replacing Flowmeter	8216215020	$7,105	$7,105											$7,105										
185	Wakefield	Restrictor Renewals	Restrictor Renewals	8216215012	$8,932	$8,932	$8,932																				
187	Wakefield	Treeton Place Water PS	Replacing Control gear, Electrical, Flowmeter,	8216215013	$57,855	$57,855							$7,105					$50,750									
188	Wakefield	Valve Renewals	Valve Renewals	8216215014	$62,509	$62,509											$37,068					$25,441					
191	Wakefield	Wakefield Pipeline Renewals		8216215007	$800,000	$800,000			$100,000		$100,000				$100,000		$100,000		$100,000		$100,000		$100,000				
195	Richmond	Meter Renewals	Meter Renewals	8016215038	$4,380,000	$4,380,000		$595,680		$595,680		$595,680		$595,680		$595,680		$595,680	$84,919	$90,123	$90,123	$90,123	$90,123	$90,123	$90,123	$90,123	$90,140
196	Motueka - Coastal	Meter Renewals	Meter Renewals	8026215007	$480,000	$480,000				$96,000	$96,000	$96,000	$96,000	$96,000													
205	Dovedale	Top Hepe Reservoir	Upgrade Reservoir	8056215024	$20,000	$20,000	$20,000																				
207	Richmond	Re-zoning - Edward, Roeske Wilke	Upgrading Edward St, Roeske St and Wilkes S	8016215088	$1,009,100	$754,482							$75,448	$150,896	$528,137												
217	Redwoods Valley	Resource Consent - Water Take	Renewing Resource Consent	8066215018	$40,000	$40,000				$30,000	$10,000																
218	Richmond	Richmond Source Resource Conse	Renewing Resource Consent	8016215092	$40,000	$40,000			$30,000	$10,000																	
219	Richmond	Waimea Source Resource Consen	Renewing Resource Consent	8016215064	$40,000	$40,000				$30,000	$10,000																
220	Kaiteriteri/Riwaka	Resource Consent - Water Take	Renewing Resource Consent	8236215007	$30,000	$30,000		$20,001	$9,999																		
221	Motueka - Coastal	Resource Consent - Water Take	Renewing Resource Consent at both source sit	8026215016	$30,000	$30,000		$20,001	$9,999																		
222	Wakefield	Resource Consent - Water Take	Renewing Resource Consent	8216215022	$30,000	$30,000			$20,001	$9,999																	
223	88 Valley	Resource Consent - Water Take	Renewing Resource Consent	8046215022	$30,000	$30,000			$20,001	$9,999																	
224	Brightwater	Resource Consent - Water Take	Renewing Resource Consent	8156215023	$30,000	$30,000				$20,001	$9,999																
225	Dovedale	Resource Consent - Water Take	Renewing Resource Consent	8056215025	$30,000	$30,000					$20,001	$9,999															
226	Tapawera	Resource Consent - Water Take	Renewing Resource Consent	8186215008	$30,000	$30,000						$20,001	$9,999														

Item	Scheme	Project Name	Description	GL Code	Total Project Cost	Total Renewals	2012/13 Year 1	2013/14 Year 2	2014/15 Year 3	2015/16 Year 4	2016/17 Year 5	2017/18 Year 6	2018/19 Year 7	2019/20 Year 8	2020/21 Year 9	2021/22 Year 10	2022/23 Year 11	2023/24 Year 12	2024/25 Year 13	2025/26 Year 14	2026/27 Year 15	2027/28 Year 16	2028/29 Year 17	2029/30 Year 18	2030/31 Year 19	2031/32 Year 20	Beyond Year 20
227	Upper Takaka	Resource Consent - Water Take	Renewing Resource Consent	8196215008	$30,000	$30,000						$20,001	$9,999													
228	Collingwood	Resource Consent - Water Take	Renewing Resource Consent	8226215006	$30,000	$30,000						$20,001	$9,999													
229	Murchison	Resource Consent - Water Take	Renewing Resource Consent	8176215015	$30,000	$30,000							$20,001	$9,999												
230	Pohara	Resource Consent - Water Take	Renewing Resource Consent	8576215009	$30,000	$30,000													$20,001	$9,999						
231	Motueka - Plains	Relocate Fearons Bush WTP to Pa	Relocate Fearons Bush WTP to Parkers Street		$375,000	$150,000						$150,000														
				TOTALS	$142,172,643.63	$37,952,647	$580,046	$1,266,850	$1,282,336	$3,730,507	$2,626,665	$2,043,464	$1,059,032	$1,657,769	$2,507,543	$3,082,028	$2,147,314	$1,909,920	$1,338,000	$2,958,735	$1,002,471	$1,697,090	$1,103,572	$1,403,806	$499,674	$1,910,506	$2,145,316

Note: Does not include inflation

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APPENDIX J. DEPRECIATION AND DECLINE IN SERVICE POTENTIAL

J.1 Depreciation of Infrastructural Assets

Depreciation is provided on a straight line basis on all infrastructural assets at rates which will write off the cost (or valuation) of the assets to their estimated residual values, over their useful lives.

The remaining useful lives and associated rates for the water infrastructure are detailed in Appendix D – Asset Valuations.

J.2 Decline in Service Potential

The decline in service potential is a decline in the future economic benefits (service potential) embodied in an asset.

It is Council policy to operate the water supply activity to meet a desired level of service. Council will monitor and assess the state of the water infrastructure and upgrade or replace components over time to counter the decline in service potential at the optimum times.

J.3 Council's Borrowing Policy

Council's borrowing policy is that it only funds capital and renewal expenditure through borrowing, normally for 20 years, but shorter or longer terms are used for some assets depending on how long they are expected to last before they need to be replaced. Council has adopted this approach instead of setting aside funds to replace assets as they wear out, i.e. funding depreciation. By the time the asset needs to be replaced Council would normally have repaid the loan for the original asset and can borrow for the replacement asset.

This method of funding capital expenditure provides intergenerational equity, this means that those people that receive the benefit from the asset generally pay for the asset. Notwithstanding this, Council is investigating whether other means of funding assets is more appropriate. Any change is likely to result in an increase in rates and charges in the immediate time period, but might provide longer term benefits.

APPENDIX K. PUBLIC DEBT AND ANNUAL LOAN SERVICING COSTS

K.1 General Policy

The Council borrows as it considers prudent and appropriate and exercises its flexible and diversified funding powers pursuant to the Local Government Act 2002. The Council approves, by resolution, the borrowing requirement for each financial year during the annual planning process. The arrangement of precise terms and conditions of borrowing is delegated to the Corporate Services Manager.

> *The Council has significant infrastructural assets with long economic lives yielding long term benefits. The Council also has a significant strategic investment holding. The use of debt is seen as an appropriate and efficient mechanism for promoting intergenerational equity between current and future ratepayers in relation to the Council's assets and investments. Debt in the context of this policy refers to the Council's net external public debt, which is derived from the Council's gross external public debt adjusted for reserves as recorded in the Council's general ledger.*

Generally, the Council's capital expenditure projects, with their long term benefits, are debt funded. The Council's other district responsibilities have policy and social objectives and are generally revenue funded.

The Council raises debt for the following primary purposes.

- Capital to fund development of infrastructural assets.
- Short term debt to manage timing differences between cash inflows and outflows and to maintain the Council's liquidity.
- Debt associated with specific projects as approved in the Annual Plan or LTP. The specific debt can also result from finance which has been packaged into a particular project.

In approving new debt, the Council considers the impact on its borrowing limits as well as the size and the economic life of the asset that is being funded and its consistency with Council's long term financial strategy.

The Borrowing Policy is found in Volume 2 of Council's Long Term Plan.

K.2 Loans

Loans to fund capital projects over the next 10 years add up to the following costs detailed in Table K-1.

Table K-1: Projected Capital Works Funded by Loan

Water Supply	2012/13 Year 1	2013/14 Year 2	2014/15 Year 3	2015/16 Year 4	2016/17 Year 5	2017/18 Year 6	2018/19 Year 7	2019/20 Year 8	2020/21 Year 9	2021/22 Year 10
Loans Raised **(x 1,000)**	3,012	6,614	7,785	5,554	9,246	3,686	8,497	10,613	9,805	16,489
Opening Loan Balance	20,694	22,245	27,207	38,262	40,900	47,374	47,714	52,863	59,675	65,225

Note: Figures do not include for inflation and are in thousands of dollars (ie. x 1000)

K.3 Cost of Loans

Council funds the principal and interest costs of past loans and these are added to the projected loan costs for the next 10 years as shown in Table K-2.

Table K-2: Projected Annual Loan Repayment Costs for Next 10 Years

Water Supply	2012/13 Year 1	2013/14 Year 2	2014/15 Year 3	2015/16 Year 4	2016/17 Year 5	2017/18 Year 6	2018/19 Year 7	2019/20 Year 8	2020/21 Year 9	2021/22 Year 10
Loan Interest **(x 1,000)**	1,288	1,508	1,897	2,686	3,065	3,387	3,755	4,044	4,599	5,228
Loan Principal	1,462	1,651	1,980	2,915	2,772	3,347	3,347	3,801	4,255	4,797

Note: Figures do not include for inflation and are in thousands of dollars (ie. x 1000)

APPENDIX L. SUMMARY OF FUTURE OVERALL FINANCIAL REQUIREMENTS

Table L-1 following presents a summary of the overall future financial requirements for the water supply activity in the Tasman district.

Table L-1: Summary of Projected Costs and Income for Next 10 years

Water	2011/2012 Budget $	2012/2013 Budget $	2013/2014 Budget $	2014/2015 Budget $	2015/2016 Budget $	2016/2017 Budget $	2017/2018 Budget $	2018/2019 Budget $	2019/2020 Budget $	2020/2021 Budget $	2021/2022 Budget $
SOURCES OF OPERATING FUNDING											
General rates, uniform annual general charges, rates penalties	101,650	101,650	101,650	101,650	101,650	101,650	101,650	101,650	101,650	101,650	101,650
Targeted rates (other than a targeted rate for water supply)	1,223,676	1,681,603	1,724,148	1,776,657	1,936,407	2,036,951	2,167,516	2,261,857	2,358,009	2,488,106	2,629,082
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges and targeted rates for water supply	5,695,116	5,811,294	6,949,738	7,182,712	8,512,139	9,087,269	10,022,463	10,585,117	11,416,951	12,222,863	11,650,650
Internal charges and overheads recovered	-	-	-	-	-	-	-	-	-	-	-
Local authorities fuel tax, fines, infringement fees, and other receipts	150,935	334,094	338,531	339,349	340,341	341,413	342,501	343,600	344,748	346,063	347,391
TOTAL OPERATING FUNDING	7,171,377	7,928,641	9,114,067	9,400,368	10,890,537	11,567,283	12,634,130	13,292,224	14,221,358	15,158,682	14,728,773
APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	4,093,431	3,844,880	4,089,710	4,217,053	4,519,157	4,653,528	4,881,448	5,010,429	5,294,484	5,464,731	5,886,418
Finance costs	1,460,608	1,288,184	1,508,295	1,896,897	2,686,308	3,064,730	3,381,346	3,755,222	4,043,776	4,598,528	5,228,397
Internal charges and overheads applied	508,696	978,662	983,458	1,015,154	1,025,995	1,059,857	1,107,135	1,120,014	1,162,917	1,215,630	1,234,528
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
TOTAL APPLICATIONS OF OPERATING FUNDING	6,062,735	6,111,726	6,581,463	7,129,104	8,231,460	8,778,115	9,369,929	9,885,665	10,501,177	11,278,889	12,349,343
SURPLUS (DEFICIT) OF OPERATING FUNDING	1,108,642	1,816,915	2,532,604	2,271,264	2,659,077	2,789,168	3,264,201	3,406,559	3,720,181	3,879,793	2,379,430

Water	2011/2012 Budget $	2012/2013 Budget $	2013/2014 Budget $	2014/2015 Budget $	2015/2016 Budget $	2016/2017 Budget $	2017/2018 Budget $	2018/2019 Budget $	2019/2020 Budget $	2020/2021 Budget $	2021/2022 Budget $
SOURCES OF CAPITAL FUNDING											
Subsidies and grants for capital expenditure	292,701	-	-	-	-	-	-	-	-	234,255	2,213,554
Development and financial contributions	807,028	474,387	505,191	486,709	763,948	739,305	763,948	739,305	751,626	745,465	757,787
Increase (decrease) in debt	2,567,018	1,550,368	4,962,410	5,804,446	2,638,454	6,473,989	339,493	5,149,454	6,812,235	5,549,310	11,693,160
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
TOTAL SOURCES OF CAPITAL FUNDING	3,666,747	2,024,755	5,467,601	6,291,155	3,402,402	7,213,294	1,103,441	5,888,759	7,563,861	6,529,030	14,664,501
APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
- to meet additional demand	312,801	1,245,600	168,997	-	-	88,262	342,910	1,075,493	1,332,420	1,005,318	3,730,228
- to improve the level of service	2,638,809	2,063,020	5,854,326	7,063,384	1,619,256	6,566,911	1,651,304	6,815,552	7,667,287	5,590,465	8,521,480
- to replace existing assets	1,265,180	526,947	1,285,729	1,375,932	4,356,453	3,268,026	2,302,553	1,334,923	2,229,462	3,760,025	4,704,878
Increase (decrease) in reserves	558,599	6,103	691,153	123,103	85,770	79,263	70,875	69,350	54,873	53,015	87,345
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
TOTAL APPLICATIONS OF CAPITAL FUNDING	4,775,389	3,841,670	8,000,205	8,562,419	6,061,479	10,002,462	4,367,642	9,295,318	11,284,042	10,408,823	17,043,931
SURPLUS (DEFICIT) OF CAPITAL FUNDING	(1,108,642)	(1,816,915)	(2,532,604)	(2,271,264)	(2,659,077)	(2,789,168)	(3,264,201)	(3,406,559)	(3,720,181)	(3,879,793)	(2,379,430)
FUNDING BALANCE	-	-	-	-	-	-	-	-	-	-	-

Note: Figures do include inflation.

APPENDIX M. FUNDING POLICY, FEES AND CHARGES

M.1 Funding Strategy

The focus of the AMPs has been on identifying the optimum (lowest life cycle) cost for operating / maintaining, renewing, developing and disposing of the assets necessary to produce the desired level of service. The Council funding strategy is based on the following.

(a) Water supply services have been assessed as having 100% user benefit and are not funded by rate appropriation.

(b) A group account shall be operated for urban schemes.

(c) All urban water supply areas once established shall be part of one combined district urban water account, shall be metered, and shall have standardised charges (except for the industrial agreement users). Membership is compulsory within the defined supply area.

(d) Water is currently charged at a fixed daily rate and a rate per unit volume. The fixed daily rate is levied on *all* metered properties inside the urban water supply area, even if not occupied.

(e) The group account shall subsidise the initial capital cost of all new schemes that meet minimum criteria by one third. Connections onto the new scheme are expected to either provide a lump sum for the remainder of the cost, or finance a loan which the Council will manage via a uniform annual charges usually over a 20-30 year period.

(f) Inside the existing urban supply areas, developers pay 100% for reticulation within the development and pay a contribution towards the future upgrading of the existing networks (Development Impact Contributions).

(g) New rural extensions off urban schemes are self-funding by the users with no subsidy from the group Urban Account.

(h) In the rural schemes, new connections pay a capital contribution fee and are self-funding for the costs of installed new reticulation.

Funding sources available for water supply schemes include:

- user charges
- development contributions (DCs)
- loans
- private (developer/community) funded works.

New urban schemes must meet five criteria to obtain Council approval to subsidise the capital funding:

- there must be a community health need
- there must be a need to comply with a minimum development standard
- there must be consultation with potential users (although their wishes may be overridden by the above factors)
- the scheme must be economically viable
- such schemes are compulsory for all properties within the defined areas.

Major capital projects may be loan funded. When loans are made, the loan is taken for a fixed period, usually 20-30 years, with a fixed annual principal repayment as a capital expense on the account, and interest payments as an operating expense. For the purpose of the financial forecasts, all new works and renewal work have been assumed to be loan funded.

M.2 Schedule of Fees and Charges

The fees and charges for the water supply assets are shown in Section M.2.1 (Urban), M.2.2 (Rural), and M.2.3 (Community).

M.2.1. Urban Water Group Account

a) Metered Connections

Rate	2011/2012	2012/2013
All rating units with metered connections, excluding the Nelson Pine Industries site.	$1.73	$1.87

b) Standard Rate

Rate	2011/2012	2012/2013
Irrespective of usage – cents per day.	59.67 cents	61.81 cents

c) Connection Charges

Payable by a property that connects to the low pressure supply in one of the Group Account Rural Extension areas.

Connection Charge per Property	2012/2013 1 July – 30 June (GST incl.)
Rural Extension Water Supplies.	$4,152.00 plus outwork plus admin

Payable by a property that connects in any urban area that is part of the Group Water Account.

Connection Charge	2012/2013 1 July – 30 June (GST incl.)
All urban areas.	$1,503.00 plus outworks plus admin
Special water reading fee.	$57.00

d) Non Lump Sum Rates

These are targeted rates to meet the loan repayments for the capital cost of new schemes. Typically these relate to the two-thirds user contribution. These are for properties that elected not to make a lump sum contribution.

Rate	2011/2012	2012/2013
Kaiteriteri-Stephens Bay Water Supply Scheme.	$125.73	$125.73
Collingwood Water Supply Scheme.	$402.75	$402.75

M.2.2. Rural Water Supply Schemes

The rural water supply schemes are set up so that a unit of water will be supplied to the client each day via a restrictor. The units are not all the same in quantity delivered.

	2011/2012	2012/2013
Dovedale:		
First unit supplied ($2m^3$/day)	$607.54	$729.05
Second and subsequent units supplied	$468.38	$562.06
Redwood Valley ($2m^3$/day)	$437.30	$450.42
Eighty Eight Valley ($1m^3$/day)	$74.75	$104.65
Low flow restricted supply connections ($1m^3$/day)	$344.15	$546.91

a) Eighty-Eight Valley Rural Water Supply

This area also has a targeted rate per property that was introduced to more equally share the cost of building up a credit balance to pay for future capital works.

Rate	2011/2012	2012/2013
Targeted Rate Per Property:	$86.25	$120.75

b) Rural Water Supply Connection Charges

This is the fee payable to connect to the scheme, as follows:

Connection Charge	2012/2013 1 July – 30 June (GST Incl.)
Dovedale Redwood Valley Eighty Eight Valley	Only if capacity is available
First Unit	$4,152.00 plus outwork plus admin
Additional Units	$725.00 plus outwork plus admin
To alter the restrictor element, i.e. increase/decrease water allocation	$200.00
To remove and/or relocate the restrictor	Outwork plus admin

M.2.3. Community Water Supply Funding

a) Motueka Urban Water Supply Area

Motueka is only partly serviced and will only join the Group Water Account when the proposed full scheme is completed.

The expenditure up to the year when Motueka joins the Group Account is to be funded by the following rates.

Rate	2011/2012	2012/2013
Targeted rate of cents per cubic metre of water used	$1.73	$1.87
Targeted rate set differentially on where the land is situated for capital and/or maintenance expenditure	$77.02	$35.55

b) Hamama Rural Water Supply

Rate	2011/2012	2012/2013
Rate is based on a cents per dollar of land value	0.0390 cents	0.0543 cents
Connection Charge	$162.71	$170.84

c) Takaka Fire Fighting Water Supply Area

A targeted rate will be set differentially based on where the land is situated. This rates cover the capital and maintenance of fire fighting scheme within the Takaka township area.

Funding of Capital Cost:

Rate	2011/2012	2012/2013
Golden Bay Ward per property	$15.33	$15.33
Takaka Residential per property	$52.13	$52.13
Takaka Commercial CBD - cents per dollar of capital value	0.1012 cents	0.1013 cents

Funding of Operating Cost:

Rate	2011/2012	2012/2013
Takaka Residential and Commercial CBD per property	$46.00	$46.00

d) Wai-iti Dam Costs

Rate	2011/2012	2012/2013
Per property	$335.45	$356.50

e) Waimea Water Augmentation (Lee Valley)

Rate	2011/2012	2012/2013
Per property	$25.55	$25.55

APPENDIX N. DEMAND MANAGEMENT

N.1 Introduction to Water Demand Management

Tasman District Council has developed this Appendix of the AMP as an overarching Tasman District Water Demand Management Plan (WDMP) in order to set out a roadmap for future demand management throughout the district. The findings of this WDMP will also assist Council to monitor its performance towards meeting its target levels of service.

Council has completed scheme specific WDMPs for five of the largest water supply schemes in the district and the results from these WDMPs are included in this overarching document.

1. Richmond.
2. Brightwater/Hope.
3. Wakefield.
4. Mapua/Ruby Bay.
5. Waimea.

Council will continue to complete WDMPs for other water supplies as and when they can be afforded within Council budgets. It is intended that this plan will be updated every time a WDMP is completed or reviewed for each community so that this district wide plan remains a current and overarching plan to direct Council's water demand activities.

The plan will also be reviewed to assess progress and outcomes of demand management measures at least every three years in advance of Council's Long Term Plan development and perhaps more frequently if Council considers there is a need.

N.2 Objective

The objective of this Water Demand Management Plan is to provide a framework and action plan to continuously improve efficient use of water and water demand management across Tasman District Council water supplies, targeting the highest demands / water loss first, to achieve a level of water demand management that is consistent with good performance in New Zealand.

By doing this Council will ensure its use of the water resource is efficient which is one of the levels of service that contributes to the community outcome "our unique and special natural environment is bountiful, healthy, clean and protected" (refer levels of service Appendix R).

Council has set level of service performance measures for residential water consumption and non-revenue water that it will report on (refer Appendix R, performance measures 3 and 4). These are weighted averages of the performance of all water supplies.

To achieve these performance measures, Council intends to set targets for each water supply for the following:

- residential water consumption in L/capita /day (metered customers only)
- non-revenue water in L/connection/day (this measure is recommended for process benchmarking and target setting)
- infrastructure Leakage Index (the ratio of the current level of leakage against the theoretical unavoidable annual level of leakage, incorporates the current system pressure, length of mains and length of service connections and is recommended for metric benchmarking between supplies).

There are no accepted New Zealand benchmarks for water loss and it appears that few New Zealand water suppliers currently set water loss targets. Council wants to set targets that achieve efficient use of water but are also achievable and affordable. Therefore when adopting targets, Council will qualitatively balance:

- where it can get the best 'bang for buck' in terms of reducing water use / leakage
- the scarcity of water – recognising that Council and the community get better value by conserving water where it is most scarce

- affordability of reduction activities
- water usage / leakage performance compared to other New Zealand water supplies.

Targets will be adopted for each water supply as WDMPs are completed.

N.3 Water Demand Assessment Outcomes

N.3.1. Current Progress

The completed WDMPs include historic water demand assessment for:

- bulk water production (also called total demands)
- metered residential consumption
- non-revenue water including leakage.

The outcomes of the completed water demand assessments are briefly described in the following sub-sections. For more detail, see each individual WDMP.

N.3.2. Bulk Water Production Record Assessment

The outcomes of bulk water demand assessments carried out on Tasman District Council water supplies to date are shown in Table N-1. Bulk water demands include total demands from residential, rural-residential, commercial, industrial and institutional properties, along with non-revenue water such as leakage, fire fighting, mains flushing etc.

The three year demands shown in the table are based on data from 2008 to 2010, with the exception of Mapua / Ruby Bay which is based on 2010 data only (due to a significant reduction in demand following repair of a major leak in early 2010) and Wakefield which is based on 2008 to 2009 (due to meter reading errors in 2010).

Table N-1: Outcome of Bulk Water Analyses for Tasman Water Supplies

Water Supplies	3 Year Average Day Demand (m^3/day)	3 Year Peak Week Demand (Peak Week: Average Day Ratio)	3 Year Average Total Per Capita Usage (L/capita/day)	Climate Corrected Average Per Capita Usage (L/capita/day)
Richmond	3,900	5,600 (1.4)	280	305
Brightwater / Hope	1,600	2,400 (1.5)	530	560
Wakefield	720	1,100 (1.5)	310	380
Mapua / Ruby Bay	1,000	1,700 (1.7)	420	415
Waimea	3,100	5,400 (1.7)	1,490	n/a
Murchison	tbc*	tbc	tbc	tbc
Collingwood	tbc	tbc	tbc	tbc
Tapawera	tbc	tbc	tbc	tbc
Upper Takaka	tbc	tbc	tbc	tbc
Dovedale	tbc	tbc	tbc	tbc
Redwood Valley	tbc	tbc	tbc	tbc
Eighty Eight Valley	tbc	tbc	tbc	tbc
Motueka	tbc	tbc	tbc	tbc
Pohara	tbc	tbc	tbc	tbc
Hamama	tbc	tbc	tbc	tbc

Note: * = to be completed

Figure N-1 shows available 2010 Council scheme bulk demand data benchmarked against 16 New Zealand councils using published data from council demand management plans and the Water New Zealand National Performance Review 2009/2010 Summary Report, published by the New Zealand Water and Wastes Association.

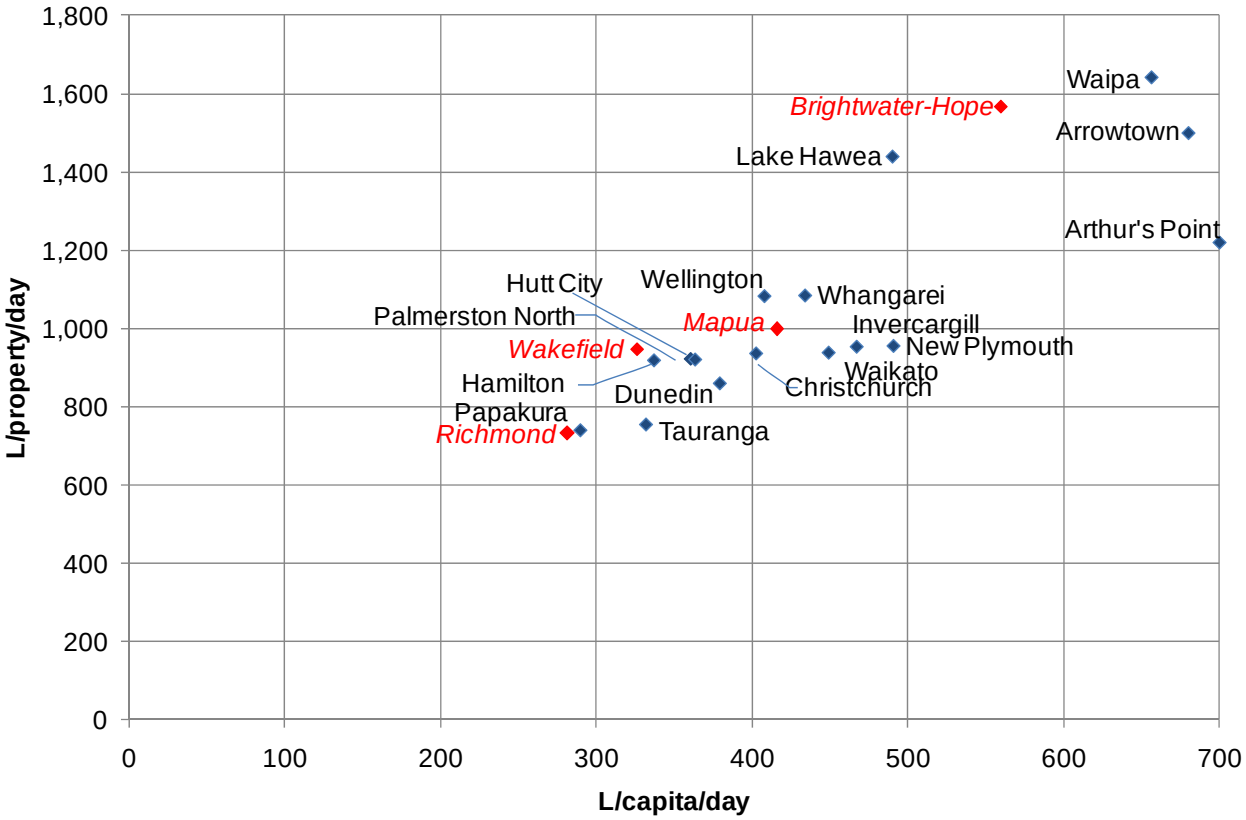


Figure N-1: Benchmarking Bulk Demand Data against other New Zealand Supplies

Figure N-2 shows that the water use from the Tasman District Council water supplies is comparable to other New Zealand communities that we have information on. The exception is Brightwater / Hope where there is very high water use measured. Without any major water industrial or commercial water user in Brightwater / Hope, this indicates high water losses.

Waimea is not shown on the plot because the total consumption for Waimea (1,490 L/capita/day, or 3,620 L/property/day) is significantly higher than the other water supply schemes because of the significant proportion of industrial consumption. This significant influence of industrial users on the total consumption figures confirms that the use of total or bulk per person demand at a production level does not provide a reliable benchmark. It is preferable to benchmark the residential consumption per capita as discussed further in Section N.4.

N.4 Residential Consumption

Apart from a small proportion of rural-restricted[6] properties, all of the customers in the Council's water supply schemes are metered and have volumetric charging for water. Figure N-2 shows available Council's metered residential consumption data from the most recent year benchmarked against 19 councils from across New Zealand (the councils without residential metering and volumetric pricing are shown in grey). The data from the six Auckland local network operators is from the Auckland Water Group 2007/08 Annual Benchmarking Report. The data for the other councils was sourced from the 2009/2010 National Performance Review Report.

[6] Restricted connections are connections that have a physical restriction in the pipeline to limit the flow to the property to deliver a set volume of water to a property over a 24 hour period.

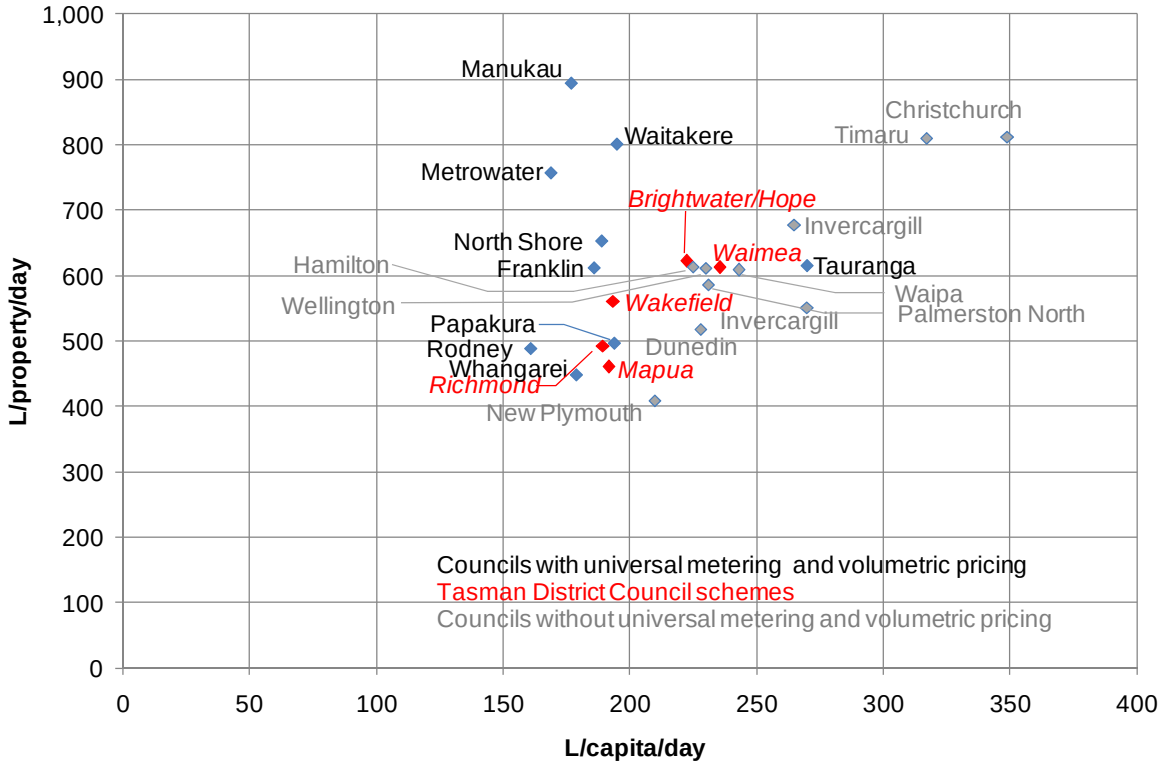


Figure N-2: Benchmarking metered residential consumption against other New Zealand supplies

The plot above shows that Richmond, Wakefield and Mapua's metered residential consumption is comparable on an L/capita/day basis against the other New Zealand cities and towns shown. It also shows the influence of metering and charging as all those councils without residential metering and volumetric pricing have higher per capita consumption from 200 through to 350 L/capita/day (it should be noted that these councils will have estimated these values due to the lack of measured residential consumption data). All of the former Auckland cities reported metered residential consumption between 150 and 200 L/capita/day, whereas the Tasman District Council schemes report values between 190 and 235 L/capita/day. We expect that the wider range of residential consumption rates in Tasman District Council compared to the Auckland region is due to the influences of holidaymakers in the area over summer, as well as typically drier summers and higher garden watering in many of the Tasman district areas.

N.5 Non-residential Consumption

The water demand management plans for each water supply have identified the highest water users in each water supply. Most of these are non-residential properties including schools and rest homes, industrial properties and commercial properties. It is intended that these properties are visited and a water audit undertaken to inform property owners of water use and to look for water conservation opportunities.

N.6 Water Losses

The outcomes of water loss assessments carried out on Tasman District Council water supplies are shown in Table N-2. This table includes the World Bank Institute's rating based on their guideline bands for the Infrastructure Leakage Index (ILI) in developed countries, from A (Excellent) through to D (Very Bad). The World Bank Institute's guideline bands are shown in the matrix in Section N.11. The water loss assessments for Richmond and Waimea have been combined to show one result due to uncertainties around the number of residential connections within the Richmond area that are actually fed from the Waimea scheme (in the near future the Richmond and Waimea water sources will be combined and treated through one water treatment plant).

Table N-2: Outcome of Water Loss Assessments for Tasman Water Supplies

Water Supplies	Water Demand Assessment Status	Infrastructure Leakage Index (ILI)	Estimated Leakage (L/connection/day)	Non-revenue Water as a Percentage of Water Production
Richmond / Waimea	Completed Aug 2010 and Feb 2011. Updated August 2011.	2.3 – B Good	173	14%
Brightwater / Hope	Completed Aug 2010	7.6 – C Poor	575	39%
Wakefield	Completed Aug 2010	3.9 – B Good (just)	270	32%
Mapua / Ruby Bay	Completed Feb 2011	1 – A Excellent	105	16%
Murchison	Not yet started	Unknown	Unknown	Unknown
Collingwood	Not yet started	tbc	Tbc	tbc
Tapawera	Not yet started	tbc	Tbc	tbc
Upper Takaka	Not yet started	tbc	Tbc	tbc
Dovedale	Not yet started	tbc	Tbc	tbc
Redwood Valley	Not yet started	tbc	Tbc	tbc
Eighty Eight Valley	Not yet started	tbc	Tbc	tbc
Motueka	Not yet started	tbc	Tbc	tbc
Pohara	Not yet started	tbc	Tbc	tbc
Hamama	Not yet started	tbc	Tbc	tbc

Figure N-3 shows the Council's leakage data from the most recent year benchmarked against 18 councils from across New Zealand.

The data from the Auckland local network operators was from the 2007/08 Annual Performance Review Auckland Water Industry produced by the Auckland Water Group (Manukau Water, MetroWater, North Shore City Council, Rodney District Council, Waitakere City Council, United Water and WaterCare).

The data for the other councils was sourced from the Water New Zealand National Performance Review 2008/2009 and 2009/10 Summary Reports. Note that the councils without residential metering will typically have estimated the leakage values due to the lack of measured residential consumption data for the annual water balance.

Note, it would have been preferable to benchmark using the ILI but this measure was not included in the Annual Benchmarking Report nor the National Performance Review Report (L/connection/day is preferable for target setting for a water supplier).

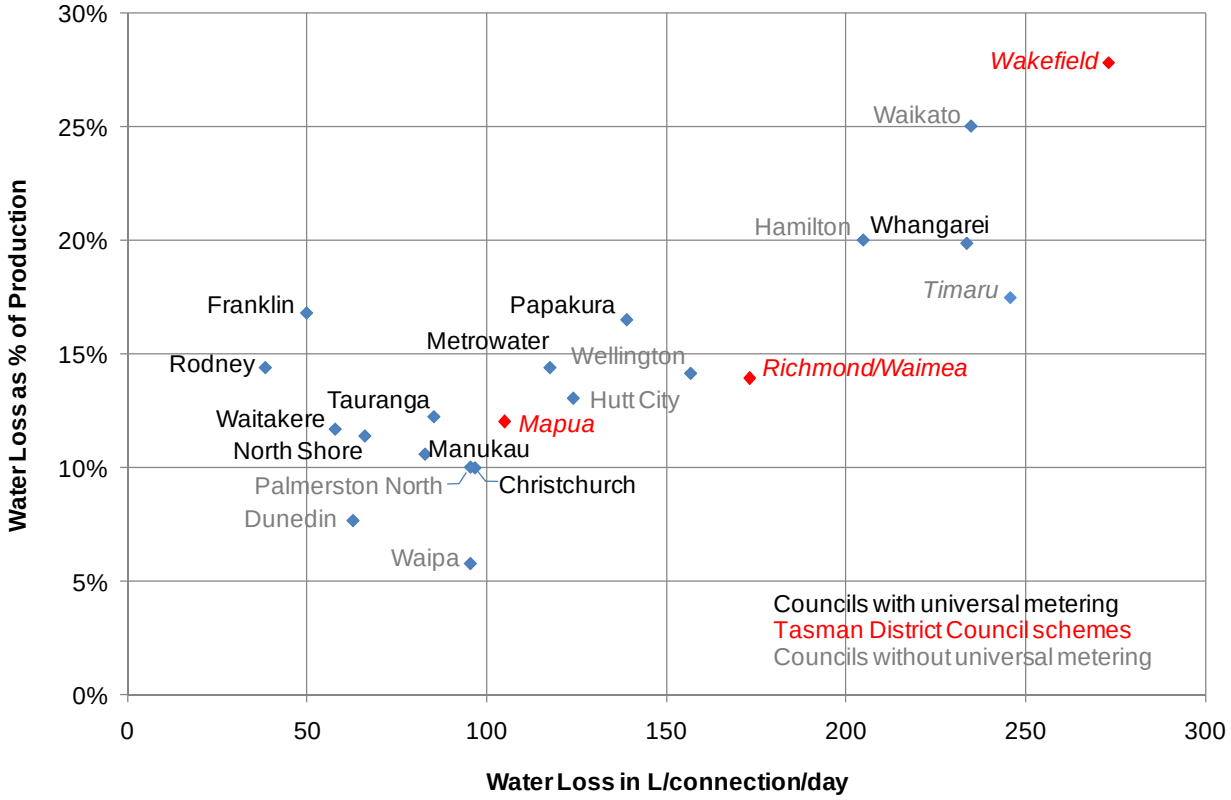


Figure N-3: Benchmarking Water Losses against other New Zealand Supplies

The plot shows that Mapua and Richmond/Waimea compare well to the other New Zealand cities and towns. Richmond / Waimea is slightly high in comparison and warrants some attention. However Brightwater / Hope (off the chart at 575 L/connection/day and 39% of production) and Wakefield have the highest reported leakage levels of any of the benchmarked schemes and should have a high priority for leakage reduction.

N.7 Water Demand Management Measures

N.7.1. Introduction to Water Demand Management

Water demand management options can be categorised into two key areas, measures and instruments.

- **Measures** – 'what to do' to achieve a reduction in water-use (eg. conversion of inefficient showers to efficient star rated showerheads).
- **Instruments** – 'how to do it' (how to ensure that the chosen 'measures' are put into place or taken up), which include the following types.
    - Economic – incentives such as rebates and retrofits for efficient fixtures and fittings or cost-reflective pricing which makes customers consider how they can reduce their water use to reduce their water bills.
    - Regulatory – the use of local development consent conditions to ensure all new properties sold achieve a specified level of water efficiency and minimum water efficiency performance standards at a national level that require all products sold to achieve a specified level of water efficiency.
    - Communicative – education and advertising / marketing to promote a water efficiency consciousness and promote behavioural changes.

In addition, the Water Services Association of Australia (WSAA) recommends identification of "foundation options" as they have often been critical elements to the success of a demand management programme. It may be difficult to analyse the costs and attribute savings to these options, however they should be considered in the full programme.

Foundation options include.

- An effective on-going education and public awareness campaign that ensures the community understand how they use water and how they may be able to save water.
- A customer advisory service which assists in communicating to the public how to save water and participate in water efficiency programmes.
- The use of regular billing cycles including customer feedback on bills to advise on how the customer is tracking with respect to previous billing cycles and typical household water consumption.
- Effective user-pays cost-reflective pricing including consideration of inclining block water and wastewater tariffs and peak, drought and scarcity pricing.
- Basic system management including systematic replacement of customer water meters and calibration of bulk water meters to ensure a high level of water accounting accuracy.

WSAA recommends designing both structural and behavioural changes into a demand management programme and using more than one instrument. A combination of at least two instruments is generally most effective. For example, an economic incentive for an indoor retrofit, plus communicative and educative material about water saving tips around the home, have the potential to tap into both structural and behavioural conservation.

Similarly, whenever considering changing a single measure such as a washing machine, at least two instruments are recommended to maximise effectiveness. For example, an economic incentive and communication/education that recognises both structural and behavioural changes can take place (eg. a more efficient machine and the participant being informed that they can save both water and energy if they wait to use a full load when washing clothes, which will save them money).

N.7.2. Water Demand Management Progress

In Council's Water Supply AMP 2009-2019, Council proposed a staged approach for improving water demand management in the district. Progress on these actions since the publication of Council's 2009 Water Supply AMP is detailed in Table N-3.

Table N-3: Water Demand Management Progress Since the Publication of 2009 Water Supply AMP

Actions from the 2009 AMP	Description	Benefit	Progress since the 2009 AMP	Future Plans
Bulk Meter Installation and Night Flow Monitoring	Identify locations for installation of new bulk meters with data loggers (or connections to SCADA however, this is expected to be more expensive), at for example reservoir outlets. Develop a night flow monitoring programme to estimate and monitor the level of leakage in each scheme from the bottom-up.	On-going monitoring of leakage in top priority schemes.	Have installed reservoir outlet flow meters in Waimea, Brightwater and Wakefield. Richmond Queen Street reservoir (the main reservoir) completed with a works order issued for Valhalla Reservoir.	None identified.
Further Demand Analysis	Further analyse historic water demands in each water supply system (16 in total) and identify trends and patterns in water use. Assess water supply issues for each system.	Identify schemes with highest demands.	Completed demand analysis for five schemes as part of the WDMP preparation.	Complete remaining plans as per performance measure targets.
Assess Level of Water Loss	Undertake an annual water balance for at least the most recent year of data in each urban system (10 in total) to assess the portion of water that is non-revenue (ie. water loss, meter under-registration etc.). Identify potential for water loss reduction in each urban system including estimation of the economic level of leakage for each system. Identify high leakage areas to prioritise for proactive leakage reduction.	Identify top priority schemes for further leak reduction and night flow monitoring.	Completed water loss assessment for five schemes as part of the WDMP preparation. Prioritised night flow monitoring in Brightwater and Wakefield methodology prepared.	Night flow monitoring to be undertaken in Brightwater and Wakefield this financial year. Planned to occur early September 2011.
Proactive Leak Reduction in Pilot Community	Develop a leakage reduction programme in a pilot community to prioritise on high leakage areas. Includes leak location and infrastructure repair / renewal.	Pilot to demonstrate effectiveness of leakage reduction.	Completed leakage reduction and priority repairs in Mapua and Brightwater in early 2010, Motueka, Wakefield and Collingwood mid-2011.	Night flow monitoring in Brightwater and Wakefield in September 2011 to measure effectiveness of leakage reduction.
Hydraulic Modelling Upgrades	Undertake recalibration of the existing Infoworks water supply models, based on the latest GIS, population, water connection and demand data. The models are to be recalibrated on a system by system basis, prioritised based on development, proposed upgrades and known problems.	Provides a tool to assess the system performance, develop monitoring programmes and assess benefit of improvements.	Rebuilt and recalibrated Richmond water supply model and prepared Master Plan. Initial work on Motueka model.	Modelling and master plan for Mapua. Modelling and master plan for Motueka.

Actions from the 2009 AMP	Description	Benefit	Progress since the 2009 AMP	Future Plans
Meter Replacement Programme	Develop a database of all flow meters including location, year of installation / replacement, diameter, brand and calibration results. Develop a proactive meter replacement programme prioritised by cumulative volume of water through the meter or meter age.	Increased revenue and higher accuracy for water demands.	A residential customer meter replacement strategy has been developed during 2011 which recommends gradual replacement of inline meters with manifold meters (prioritised on age).	Keep gathering calibration data on meters after removal to improve understanding of meter accuracy (business as usual).
Cost-Benefit Analysis	Assess relevancy of demand management measures to each scheme and undertake a high level cost-benefit analysis for the short-listed options.	Identify options with best benefit to cost ratio for implementation.	The project is underway to complete a cost-benefit analysis for Waimea, Richmond, Hope and Mapua in 2011.	None identified.
Water Demand Management Plans	Develop a water demand management implementation plan for each scheme through workshops and incorporating results from previous actions.	Implementation plan to improve water demand management in each scheme.	This document will propose implementation plans for Richmond, Waimea, Brightwater/Hope, Wakefield and Mapua/Ruby Bay.	Remaining WDMPs to be completed as per performance measure targets.
Pressure Management	Identify through hydraulic modelling the areas within the Richmond and Waimea systems that have the highest potential for pressure management.	Identify priority areas for pressure management.	Some modification of the Richmond and Waimea supply zones is being completed to get a better distribution of water across the zones.	Richmond 2012/13.

N.8 Water Demand Management Targets

As specified in the technical performance measure, Council aims to identify demand targets (for metered residential consumption and leakage) for each water supply and implement a demand management programme to achieve those targets. Table N-4 specifies proposed metered residential consumption targets for those water supplies that have completed WDMPs.

Table N-4: Water Demand Targets for Metered Residential Consumption

Water Supply	Existing Metered Residential Consumption	Target Metered Residential Consumption	General Approach	Action Priority
Richmond	190 L/capita/day	<200 L/capita/day	Accept existing water use and identify any unusual high water users for investigation/audits.	Low
Brightwater / Hope	220 L/capita/day	<250 L/capita/day	Accept existing water use (as reasonable, refer Figure N-2) and identify any unusual high water users for investigation/audits.	Medium
Wakefield	195 L/capita/day	<200 L/capita/day	Accept existing water use and identify any unusual high water users for investigation/audits.	Low
Mapua / Ruby Bay	190 L/capita/day	<200 L/capita/day	Accept existing water use and identify any unusual high water users for investigation/audits.	Low
Waimea	235 L/capita/day	<250 L/capita/day	Accept existing water use (as reasonable, refer Figure N-2) and identify any unusual high water users for investigation/audits.	Medium
Murchison	tbc	tbc	Complete WDMP.	
Collingwood	tbc	tbc	Complete WDMP.	
Tapawera	tbc	tbc	Complete WDMP.	
Upper Takaka	tbc	tbc	Complete WDMP.	
Dovedale	tbc	tbc	Complete WDMP.	
Redwood Valley	tbc	tbc	Complete WDMP.	
Eighty Eight Valley	tbc	tbc	Complete WDMP.	
Motueka	tbc	tbc	Complete WDMP.	
Pohara	tbc	tbc	Complete WDMP.	
Hamama	N/A (unmetered)	N/A	N/A	N/A
Weighted average	196 L/capita/day	200 L/capita/day		

Table N-5 specifies proposed water leakage targets for those water supplies that have completed demand management plans.

Table N-5: Water Leakage Targets

Water Supply	Existing Leakage	Target Leakage	General Approach	Action Priority
Richmond / Waimea	190 L/conn/day 2.7 ILI	≤150L/conn/day ≤2 ILI	Undertake some leak detection and repair work and determine how much leakage reduction can be achieved. Improve data collection systems to improve confidence. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	Medium
Brightwater/ Hope	575 L/conn/day 7.6 ILI	≤300L/conn/day ≤4 ILI	Target high water losses through night flow monitoring and leak detection survey then re-assess. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	High
Wakefield	270 L/conn/day 3.9 ILI	≤200L/conn/day ≤3 ILI	Target high water losses through night flow monitoring and leak detection survey then re-assess. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	High
Mapua / Ruby Bay	105 L/conn/day 1 ILI	≤150L/conn/day ≤2 ILI	Maintain current level of leakage and consumption. Improve data collection systems to improve confidence. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	Low
Murchison	N/A	N/A	Prepare WDMP.	
Collingwood	N/A	N/A	Prepare WDMP.	
Tapawera	N/A	N/A	Prepare WDMP.	
Upper Takaka	N/A	N/A	Prepare WDMP.	
Dovedale	N/A	N/A	Prepare WDMP.	
Redwood Valley	N/A	N/A	Prepare WDMP. Improve monitoring of rural supply through installation of bulk meters.	
Eighty Eight Valley	N/A	N/A	Prepare WDMP. Improve monitoring of rural supply through installation of bulk meters.	

Water Supply	Existing Leakage	Target Leakage	General Approach	Action Priority
Motueka	N/A	N/A	Prepare WDMP.	
Pohara	N/A	N/A	Prepare WDMP.	
Hamama	N/A	N/A	Prepare WDMP.	
Weighted average	239 L/conn/day	175 L/conn/day		

N.9 Action Plan

N.9.1. Action Priorities

Based on the water demand analyses completed to date, the priority communities for action are Brightwater/Hope and Wakefield, followed by Richmond.

N.9.2. Short Term Action Plan

Table N-6 presents the short term (from 2011/12 to 2013/14) action plans for each water supply, along with cost estimates and timing.

Table N-6: Short Term Action Plans for Each Water Supply

Water Supply	Short Term Action Plan	Cost Estimates	Timing
Richmond / Waimea	Cost benefit analysis of water demand management options for Waimea Basin (combined study including Richmond, Waimea, and Brightwater).	$24,450	2011/12
	Night flow monitoring during winter to identify leakage and prioritise sub-zones for leak detection and repair.	$10,000 $10,000	2012/13 2013/14
	Leak detection survey in priority sub-zones.	$20,000 $20,000	2012/13 2013/14
	Leak repairs.	O&M budget	
	Study to investigate pressure management opportunities in Richmond and Waimea.	$30,000 (shared)	2012/13
	Install two bulk meters on rural extensions.	$3,000	2013/14
Brightwater / Hope	Cost benefit analysis of water demand management options for Waimea Basin (combined study including Richmond, Waimea and Brightwater).	$8,450	2011/12
	Night flow monitoring in winter.	$3,000 $5,000	2011/12 2012/13
	Leak detection surveys.	$15,000 $5,000	2011/12 2012/13
	Leak repairs.	O&M budget	
	Update WDMP with 2010/2011 leakage levels.	$3,000	2011/12
	Install seven bulk meters on rural extensions.	$18,000	2012/13
Wakefield	Night flow monitoring in winter.	$3,000 $5,000	2011/12 2013/14
	Leak detection surveys.	$15,000 $5,000	2011/12 2013/14
	Leak repairs.	O&M budget	
	Update WDMP with 2010/2011 leakage levels.	$3,000	2011/12
	Install one bulk meter on rural extensions.	$3,000	2013/14
Mapua / Ruby Bay	Install three bulk meters on rural extensions.	$8,800	2012/13
	Complete modelling of network.	$25,000	2012/13

Water Supply	Short Term Action Plan	Cost Estimates	Timing
Murchison			
Collingwood			
Tapawera			
Upper Takaka			
Dovedale			
Redwood Valley	Install seven bulk meters at selected locations.	$13,500	2012/13
Eighty Eight Valley	Install one bulk meter at selected location.	$3,000	2012/13
Motueka	Once Motueka Water Supply constructed and there is some actual demand data available, develop water demand management plan. This may not occur until after 2014, therefore provision is included in Table N-7.		
Pohara			
Hamama			

N.10 Long Term Action Plan

Table N-7 presents the long term action plans for the district (from 2014/15 onwards), along with cost estimates and timing.

Table N-7: Long Term Action Plans for the District

Long Term Action Plan	Cost Estimates	Timing
On-going night flow monitoring in priority schemes (completion of demand management plans will assist with prioritisation).	$10,000 per year	From 2014/15
On-going night flow monitoring and leakage detection in priority schemes (completion of demand management plans will assist with prioritisation).	$20,000 per year	From 2014/15
Demand Management Initiatives: • education programme for general public and targeting schools, including promotion of water efficient fixtures and appliances • water audits for high use non-residential properties (eg. retirement homes) • investigate water use by Council, especially parks irrigation • consider change in volumetric charging scheme.	$20,000 per year	From 2014/15
Complete WDMP for remaining water supplies and adopts water demand targets and defines demand management programmes to achieve the targets. Motueka should be completed as a priority when the proposed Motueka Plains water supply has been constructed and there is some record of actual water use.	$20,000 per year	From 2015/16

N.11 References

N.11.1. World Bank Institute Banding System for ILI in Developed Countries

Table N-8: World Bank Institute Banding System for ILI in Developed Countries

Band	ILI Values	Operational Performance in Leakage Management
A	< 2	Excellent – Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost effective improvement.
B	2 to < 4	Good – Potential for marked improvements; consider pressure management; better active leakage control practices and better network maintenance.
C	4 to < 8	Poor – Poor leakage record; tolerable only if water is plentiful and cheap; even then, analyse level and nature of leakage and intensify leakage reduction efforts.
D	> 8	Very Bad – Very inefficient use of resources; leakage reduction programs imperative and high priority.

N.11.2. Demand Management Tools

Table N-9: Summary of Demand Management Measures Currently Used and with Potential for Future Use

Demand Management Measures	Currently Used	Potential to be used in the Future
Measures - Infrastructure Management		
Active leakage control programme in targeted schemes.	✓	
Reactive leakage repair.	✓	
Pressure management.	✓	✓
Bulk metering of rural-restricted areas to improve understanding of demands.	✓	
Bulk metering of reservoir outlets to improve night flow monitoring.	✓	
Customer meter testing and replacement programme.		✓
Water modelling to improve system performance and leakage.	✓	
Advanced asset renewal planning to prioritise infrastructure replacement and reduce leakage.	✓	
Instruments - Community Engagement		
Passive education programme with information on Council website.	✓	
Community education programme with full time in-house staff champion.		✓
Educational resources and programmes for schools.		✓
Targeted education programmes for specific users, eg. rural properties.		✓
Free mobile service for water efficiency in residential properties (similar to Tauranga's Waterline service).		✓
Provision of shower timers for people to limit their shower time.		✓
Green gardener – water efficient landscaping workshops and free advice.		✓
Water advisory service and audits for water users eg. Commercial.		✓
Instruments - Regulatory Control		
Restricted connections (trickle feed) to rural properties.	✓	
Water restrictions during peak summer periods (eg. alternate day garden watering).	✓	
Active enforcement of water restrictions during peak summer periods.		✓
Mandatory water efficient fixtures in new construction eg. mandatory dual-flush		✓

Demand Management Measures	Currently Used	Potential to be used in the Future
toilets in all new toilet installations.		
Requirement for large customers to prepare demand management plans.		✓
Mix of Measures and Instruments - Water Efficient Technologies		
Rebate or subsidy or grant programme for retrofit of water efficient fixtures (can be targeted at residential properties, schools, commercial properties etc. and at specific fixtures eg. showerheads or dual flush toilets).		✓
Retrofit of water-efficient technologies into Council properties.		✓
Rebate or subsidy programme for automatic timers for residential irrigation systems.		✓
Mandatory rain/soil moisture sensors for properties with high garden watering.		✓
Instruments - Metering, Pricing and Other Financial Initiatives		
Increasing block volumetric charges for metered customers.		✓
Measures - Water Capture, Reuse and Recycling		
Rainwater tank rebate or subsidy programme.		✓
Grey water recycling rebate or subsidy programme.		✓

N.12 Climate Change

The RMA 1991 states, in Section 7, that a local authority shall take account of the effects of climate change when developing and managing its resources. To assist local authorities, the Ministry for the Environment (MfE) prepared a report[7] to support councils' assessing expected effects of climate change, and to help them prepare appropriate responses when necessary.

This section summarises information presented in the MfE report and a report by NIWA on Climate Change and Variability in the Tasman district. This section aims to explore the impacts of expected climate changes for the Tasman-Nelson region and will conclude with anticipated impacts on this activity.

N.12.1. Temperature Change

Table N-10 shows that the mean annual temperatures in Tasman-Nelson are expected to increase in the future.

Table N-10: Projected Mean Temperature Change (Upper and Lower Limits) in Tasman-Nelson (in ^{0}C)

	Summer	Autumn	Winter	Spring	Annual
Projected changes 1990-2040	0.2 - 2.2	0.2 - 2.3	0.2 - 2.0	0.1 - 1.18	0.2 – 2.0
Projected changes 1990-2090	0.9 – 5.6	0.6 – 5.1	0.5 – 4.9	0.3 – 4.6	0.6 – 5.0

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

It is the opinion of NIWA[8] scientists that the actual temperature increase this century is very likely to be more than the 'low' scenario given here. Under the mid-range scenario for 2090, an increase in mean temperature of 2.0^{0}C would represent annual average temperature in coastal Tasman in 2090.

[7] Climate Change Effects and Impacts Assessment A Guidance Manual for Local Government in NZ (MfE, May 2008)
[8] Climate Change and Variability – Tasman District (NIWA, June 2008)

N.12.2. Rainfall Patterns

Table N-11 shows an expected increase in mean annual precipitation in Tasman-Nelson from 1990 to 2090.

Table N-11: Projected Mean Precipitation Change (Upper and Lower Limits) in Tasman-Nelson (in %)

	Summer	Autumn	Winter	Spring	Annual
Projected changes 1990-2040	-14, 27	-2, 19	-4, 9	-8, 9	-3, 9
Projected changes 1990-2090	-13, 30	-4, 18	-2, 19	-20, 19	-3, 14

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

N.12.3. Heavy Rainfall

A warmer atmosphere can hold more moisture (about 8% more for every 10C increase in temperature), so there is an obvious potential for heavier extreme rainfall under climate change.

More recent climate model simulations confirm the likelihood that heavy rainfall events will become more frequent.

N.12.4. Evaporation, Soil Moisture and Drought

From their report, NIWA conclude that there is a risk that the frequency of drought (in terms of low soil moisture conditions) could increase as the century progresses, for the main agriculturally productive parts of Tasman district.

N.12.5. Climate Change and Sea Level

NIWA report that a revised guidance manual for local government on coastal hazards and climate change is currently in preparation. For the interim, NIWA's report suggests:

1. For planning and decision timeframes out to the 2090s (2090-2099) use.

- A base mean sea-level rise of 0.5m relative to the 1980-1999 average.
- An assessment of the sensitivity of the issue under consideration to possible higher mean sea-levels taking account of possible additional contributions. This level is currently under discussion, but is likely to be no less than 0.8m.

2. For planning and decision timeframes beyond 2100 where, as a result of the particular decision, future adaptation options will be limited, an allowance for mean sea-level rise of 10mm/year beyond 2100 is recommended (in addition to the above recommendation).

These projections are for mean sea levels. Less information is available on how extreme storm sea levels will change with climate change.

N.12.6. Potential Impacts on Council's Infrastructure and Services

Table N-12 lists the potential impacts on Council's infrastructure and services.

Table N-12: Local Government Functions and Possible Climate Change Outcomes

Function	Affected Assets or Activities	Key Climate Influences	Possible Effects
Water supply and irrigation.	Infrastructure.	Reduced rainfall, extreme rainfall events and increased temperature.	Reduced security of supply (depending on water source) Contamination of water supply.
Wastewater.	Infrastructure.	Increased rainfall.	More intense rainfall (extreme events) will cause more inflow and infiltration into the wastewater network. Wet weather overflow events will

Function	Affected Assets or Activities	Key Climate Influences	Possible Effects
			increase in frequency and volume. Longer dry spells will increase the likelihood of blockages and related dry weather overflows.
Stormwater.	Reticulation. Stopbanks.	Increased rainfall. Sea-level rise.	Increased frequency and/or volume of system flooding. Increased peak flows in streams and related erosion. Groundwater level changes. Saltwater intrusion in coastal zones. Changing flood plains and greater likelihood of damage to properties and infrastructure.
Roading.	Road network and associated infrastructure (power, telecommunications, drainage).	Extreme rainfall events, extreme winds, high temperatures.	Disruption due to flooding, landslides, fallen trees and lines. Direct effects of wind exposure on heavy vehicles. Melting of tar.
Planning/policy development.	Management of development in the private sector. Expansion of urban areas. Infrastructure and communications planning.	All.	Inappropriate location of urban expansion areas. Inadequate or inappropriate infrastructure, costly retro-fitting of systems.
Land management.	Rural land management.	Changes in rainfall, wind and temperature.	Enhanced erosion. Changes in type/distribution of pest species. Increased fire risk. Reduction in water availability for irrigation. Changes in appropriate land use. Changes in evapotranspiration.
Water management.	Management of watercourses/ lakes/wetlands.	Changes in rainfall and temperature.	More variation in water volumes possible Reduced water quality. Sedimentation and weed growth. Changes in type/distribution of pest species.
Coastal Management.	Infrastructure. Management of coastal development.	Temperature changes leading to sea-level changes. Extreme storm events.	Coastal erosion and flooding. Disruption in roading, communications. Loss of private property and community assets. Effects on water quality.
Civil defence and emergency management.	Emergency planning and response, and recovery operations.	Extreme events.	Greater risks to public safety, and resources needed to manage flood, rural fire, landslip and storm events
Bio security.	Pest management.	Temperature and rainfall changes.	Changes in the range of pest species
Open space and community facilities management.	Planning and management of parks, playing fields and	Temperature and rainfall changes. Extreme wind and	Changes/reduction in water availability Changes in biodiversity

Function	Affected Assets or Activities	Key Climate Influences	Possible Effects
	urban open spaces.	rainfall events.	Changes in type/distribution of pest species Groundwater changes Saltwater intrusion in coastal zones Need for more shelter in urban spaces
Transport.	Management of public transport. Provision of footpaths, cycleways etc.	Changes in temperatures, wind and rainfall.	Changed maintenance needs for public transport infrastructure. Disruption due to extreme events
Waste management.	Transfer stations and landfills.	Changes in rainfall and temperature.	Increased surface flooding risk. Biosecurity changes. Changes in ground water level and leaching.
Water supply and irrigation.	Infrastructure.	Reduced rainfall, extreme rainfall events and increased temperature.	Reduced security of supply (depending on water source). Contamination of water supply.

Source: Climate Change Effects and Impacts Assessment (MfE, May 2008)

Council have incorporated the potential impacts of climate change in the 2008 update of the Engineering Standards and Policies.

APPENDIX O. THE SUPPLY OF WATER FOR FIREFIGHTING PURPOSES

O.1 Fire-Fighting Levels of Service

In urban schemes, the water supply system is designed to meet W3 Standard from the NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 (SNZ 4509:2003). In highly commercial, central business district areas, a W4 standard will be provided at the discretion of the Council. The Council considers it the responsibility of building owners to provide their own systems if their building requires a higher fire fighting standard to be met.

Table O-1: The Supply of Water for Fire Fighting Purposes

Standard	Reticulated Flow (l/s)	Max No. hydrants from which the required flow is to be obtained within a 270m radius	Max. spacing of fire hydrants	Reserve storage capacity or alternative supply in water supply scheme
W3	25	2	135 m	0.5 hour as 25l/s 45,000 litres
W4	50	3	135 m	1 hour at 50l/s 180,000 litres

No fire fighting capability is provided from rural water supply systems.

In the areas of Motueka that are not reticulated, there are several fire wells provided for fire fighting purposes. The Council does not guarantee that these will meet the requirements of the Code.

O.2 The Degree to which Fire Hydrants Presently Meet the Requirements of the Fire Service Standards

System modelling had been carried out in Richmond/Waimea in 2011. Generally the water supply systems modelled meet the standard for fire fighting requirements but with a few exceptions.

- *Richmond* – Lower Queen Street, Appleby Highway, Gilbert Street, Hill Plough Heights and Cropp Place These issues should be resolved in the future with pipeline upgrades.

The commercial town centre of Richmond was analysed for class FW4 (50l/s for 90 minutes), where two hydrants achieved the necessary flows and pressures.

A new fire fighting main was installed in Takaka CBD in 2011, this system complies with the new FW3 standard (SNZ 4509:2008). The original fire fighting wells have been de-commissioned.

System modelling had been carried out in Mapua/Ruby Bay, Wakefield and Brightwater in 2007. This model was analysed against the NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 W3 (25l/s for 30mins) standard, where the water supply systems modelled generally met this standard, but with a few exceptions.

- *Wakefield* - Clifford Road, Martin Avenue and the Whitby Road areas.
- *Brightwater* - Main Road Hope from Aniseed Valley Road to Bateup Road.
- *Mapua/Ruby Bay* - Brabant Drive area of Ruby Bay.

Within the same study the Waimea system was examined to determine fire fighting capacity for commercial W4 (50l/s for 60 minutes) fire risk classes. The Waimea industrial area has a very high capacity due to the 450mm principal main and performs well under fire fighting stresses. 150l/s class W6 compliance is achieved along Nayland Road with a residual pressure of 15m and adjacent to Nelson Pine Industries Ltd factory on Queen Street the simulated residual pressure is 55m.

Other urban water supply systems with known fire fighting deficiencies against the 2003 W3 standard include.

- Upper Takaka's fire fighting capability does not meet the W3 standard.
- In Collingwood the south end of Beach Road and high area around Swiftsure Street do not meet the W3 standard.
- In Motueka the areas covered by fire wells do not meet the W3 standard.

A new town potable water supply scheme for Motueka is planned for construction in 2013 – 2016. This will address deficiencies in the current fire fighting system.

O.3 Monitoring of Fire Fighting Supplies and Future Intentions for the Service

The NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 (SNZ 4509:2003) has been replaced with NZ Fire Service Fire Fighting Water Supplies Code of Practice 2008 (SNZ 4509:2008). This has resulted in a change of standards. Under the 2008 Code of Practice, FW3 is the comparative replacement for W4 and FW2 replaces W3.

The following work will be undertaken to check compliance against NZ Fire Service Fire Fighting Water Supplies Code of Practice 2008.

- An audit of fire hydrants throughout the district.
- The fire wells in Motueka to be tested annually.
- Hydraulic modelling will be undertaken for a number of urban water supply systems. The fire flows will be assessed as part of this exercise to check against NZ Fire Service Fire Fighting Water Supplies Code of Practice 2008 FW3 Standard. The current hydraulic models will be maintained and recalibrated on a regular basis.

APPENDIX P. POTENTIAL SIGNIFICANT EFFECTS

The potential significant negative and positive effects on the community of undertaking the water supply activity are detailed in Table P-1 and Table P-2 following.

Table P-1: Potential Significant Negative Effects

Activity	Effect on Community Wellbeing	Significance	Current Controls
Construction of Future Schemes	**Social** - Installation of water schemes do cause a disruption to the local community. The works can impact on traffic flow, noise, dust and a visual impact. Shutdowns may result in residence not receiving water during the day. **Economic** - This may result in customers avoiding the works and therefore nearby business may lose out. Shutdowns may result in businesses not receiving water during the day. **Environmental** - Construction of water contracts typically creates greater noise and dust. The TRMP and specific resource consents must be followed. Projects can involve acts such as de-watering, which requires the water to be discharged. Potential risk to the environment.	Medium	Public consultation. Notifying the public of the works through various forms of the media.
Water Restrictions	**Social** - Typically effects people who use the water for washing cars or watering the garden. This can frustrate the local community. **Economic -** This can have a larger impact on businesses that rely on using water for irrigation. This can cause a negative effect on these businesses	Medium	Council are supporting the Lee Valley Dam project and have made allowances in the AMP for new water sources. Council has made allowances for improving the demand management which will assist with making the water usage more sustainable.
Malfunction of Water Assets	**Social -** Can cause disruption to supply. This is frustrating to the local community. **Economic -** If the businesses rely on a water supply and has no built in storage, then loss of water is a major inconvenience.	Minor	Council relies on the operation and maintenance contractor responding quickly to any malfunction.
Spillage of Chemicals Stored at Water Treatment Plants	**Social -** The rate payer expects the council to handling all chemicals in the correct manner. **Economic -** Businesses which rely on nearby watercourses may not be able to operate until the chemical spill is resolved**.** **Environmental** - Tasman region is an environmentally sensitive area, any chemical spill will have a notable effect on the environment.	Major	Appropriately trained staff and contractors. All chemicals are stored in the correct manner.
Above Ground Assets	**Social -** Above ground assets may be considered a negative visual impact **Economic -** Above ground assets may be considered a negative visual impact	Minor	None

Activity	Effect on Community Wellbeing	Significance	Current Controls
Water Sources	**Social** - Water is abstracted from surface water and groundwater sources. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Economic -** Water is abstracted from surface water and groundwater sources. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Environmental -** Water abstracted from surface water, may add strain on a river system which is already very low.	Major	Council introduces water rationing during times of drought. Demand Management will assist with reducing the volume of water abstracted from the water source. Investigating new water sources and educating the public on water usage. Resource consents are in place, so Council cannot exceed a certain limit.
The Cost of Providing the Services	**Economic –** The cost of providing services is resulting in increases in rates	Major	Council uses competitive tendering processes to achieve best value for money for works it undertakes.
Historic and Wahit Tapu Sites	**Cultural –** Construction of water supply assets can potentially affect historic and wahi tapu sites	Medium	Council undertakes consultation with affect patties prior to undertaking works. Council also maintains a record of known heritage sites.

Table P-2: Potential Significant Positive Effects

Effect	Description
Providing drinking water to the community	Safe drinking water supplies provide public health benefits.
Economic development	Provision and maintenance of water supplies allows for the development of commercial businesses, industry and residential use, therefore, contributing to economic growth and prosperity in the district. Council's management of the Water Supply activities uses best practice and competitive tendering to provide value for money for ratepayers and provides jobs for contractors.
Fire fighting supply	The majority of Council's urban water supply network is built to accommodate fire fighting requirements.

APPENDIX Q. SIGNIFICANT ASSUMPTIONS, UNCERTAINTIES AND RISK MANAGEMENT

Q.1 Assumptions and Uncertainties

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

Q.1.1. Financial Assumptions

- All expenditure is stated in dollar values as at 1 July 2011, with no allowance made for inflation over the planning period.
- All costs and financial projections are GST exclusive.

Q.1.2. Asset Data Knowledge

While the Council has asset registers and many digital systems, processes and records, Council does not have complete knowledge of the assets it owns. To varying degrees, the Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.

Notwithstanding this, Council considers these assumptions and uncertainties constitute only a small risk to the financial forecasts because:

- significant amounts of asset data is known
- asset performance is well known from experience
- there are plans to upgrade significant extents of poorly performing assets.

The following assumptions that have been made are considered significant:

- The majority of the pipework in the urban water supplies is in satisfactory condition. The only known exceptions to this are:
    - the AC pipe in Richmond - this is being progressively replaced over time
    - the polyethylene laterals in Richmond, Wakefield and Murchison – these are being progressively replaced over time
    - Class B watermains within Motueka are programmed to be replaced.
- The pipework in the rural water supplies has some condition problems, however, it is considered that the cost/benefit of large scale asset replacement is such that is better not to replace. Council has in place plans and measures to identify and replace the worst performing areas and replace pipes as considered affordable.

Q.1.3. Growth Forecasts

Growth forecasts are inherently uncertain and involve many assumptions. The growth forecasts also have a very strong influence on the financial forecasts, especially in the Tasman district where population growth is higher than the national average. The growth forecasts underpin and drive:

- the asset creation programme
- Council income forecasts including rates and development contributions
- funding strategies.

Thus the financial forecasts are sensitive to the assumptions made in the growth forecasts. If the growth is significantly different it will have a significant impact. If higher, Council may need to advance capital projects. If it is lower, Council may have to defer planned works.

The significant assumptions in the growth forecasts are covered in the explanation on method and assumptions in Appendix F: Demand and Future New Capital Requirements.

Q.1.4. Network Capacity

The Council has a growing knowledge and understanding of network capacity, however, the knowledge is not complete. Council is collecting asset data and modelling the networks to enhance the understanding of system capacity. To date, hydraulic models have been created for Richmond, Wakefield, Brightwater, Mapua/Ruby Bay and Motueka. These models are planned to be re-calibrated and updated in this AMP period.

System capacity upgrades have been planned where shortfalls are known or where growth is expected, however, the models will provide new information that may create a need for new projects and/or re-prioritisation of existing projects. If the network capacity is lower than assumed, Council may be required to advance capital works projects to address this issue. The risk of this occurring is low; however the impact on expenditure could be large. If the network capacity is higher than assumed, Council may be able to defer works. The risk of this occurring is low and is likely to have little impacts.

Q.1.5. Timing of Capital Projects

The timing of many capital projects can be well defined and accurately forecast because there are few limitations on the implementation other than the community approval through the LTP/Annual Plan processes. However, the timing of some projects is highly dependent on some factors which are beyond the Council's ability to fully control. These include factors like:

- obtaining resource consent, especially where stakeholder input is necessary
- obtaining the community consent
- obtaining a subsidy from central government
- securing land to purchase and/or entry agreements.

Where these issues may become a factor, allowances have been made to complete in a reasonable timeframe, however these plans are not always achieved. The effect of this will be to defer expenditure. The impact of this on the forward projections is not considered significant.

Q.1.6. Land Purchase

That Council will be able to purchase land to undertake the capital works projects. The risk of the timing of projects changing is high due to a delay in land purchase. Council tries to mitigate this issue by undertaking consultation with landowners sufficiently in advance of the construction phase. If delays are to occur, it could have major effects on the level of service.

Q.1.7. Funding of Capital Projects

Funding of capital projects is crucial to a successful project. When forecasting projects that will not occur for a number of years, a number of assumptions have to be made about how the scheme will be funded.

Funding assumptions are made about:

- whether projects will qualify for subsidies
- whether major beneficiaries of the project (for example a factory that gets a connection to a new water supply) will contribute to the scheme, and if so, how much water they will demand?
- whether the scheme has compulsory connections or voluntary connections
- whether and how much should be funded from development contributions
- whether Council will subsidise the development of the schemes.

The correctness of these assumptions has major consequences on the affordability especially of new schemes. Council has considered each new scheme proposal individually (Coastal Tasman Area, Motueka, Pohara, Maratha) and concluded for each a funding model. The funding model will form one part of the consultation process as these schemes are advanced toward construction.

An affordability check will be undertaken within Year 1 of this AMP to confirm whether the water treatment upgrades for the rural schemes are financially viable.

Q.1.8. Lee Valley Dam

That the Lee Valley Dam will proceed and Council will be able to increase its water allocations on the Waimea Plains, including the allocation for water supply purposes. If Lee Valley Dam does not proceed, Council's current allocations may be reduced and Council would need to find alternative water sources. Any alternative is likely to be expensive for Council.

Q.1.9. Accuracy of Capital Project Cost Estimates

The financial forecasts contain many projects, each of which has been estimated from the best available knowledge. The level of uncertainty inherent in each project is different depending on how much work has been done in defining the problem and determining a solution. In many cases, only a rough order cost estimate is possible because little or no preliminary investigation has been carried out. It is not feasible to have all projects in the next 20 years advanced to a high level of estimate accuracy. However, it is preferable to have projects in the next three years advanced to a level that provides reasonable confidence about the accuracy of the estimate.

To get consistency and formality in cost estimating, the following practices have been followed.

- All expenditure is stated in dollar values as at 1 July 2011, with no allowance made for inflation over the planning period.
- All costs and financial projections are GST exclusive.
- A project estimating template has been developed that provides a consistent means of preparing estimates.
- Where practical, a common set of rates has been determined.
- Specific provisions have been included to deal with non-construction costs like contract preliminary and general costs, engineering costs, Council staff costs, resource consenting costs and land acquisition costs.
- Specific provisions have been included to deal with estimate accuracy.

These are described as follows.

A 15% provision has been included to get a "Base Project Estimate" to reflect the uncertainties in the unit rates used. A further provision has been added to reflect the uncertainties in the scope of the project – ie. is the solution adopted the right solution? Often detailed investigation will reveal the need for additional works over and above that initially expected. The amount added depends on the amount of work already done on the project. Each project has been assessed as being at the project lifecycle stage as detailed in Table Q-1 following, and from this an estimate of accuracy assessed. The estimate accuracy is added to the Base Project Estimate to get the Total Project Estimate – the figure that is carried forward into the financial forecasts.

Table Q-1: Life Cycle Estimate Accuracies

Stage in Project Lifecycle	Estimate Accuracy
Concept / Feasibility	± 30% (±20% for projects >$1m)
Preliminary Design / Investigation	± 20% (±15% for projects >$1m)
Detailed Design	± 10%
Construction	± 5%
Commissioning	± 0%

Q.1.10. Significant Assumptions and Uncertainties for Projects Assigned Over the Next Three Years

The following table details significant uncertainties and percentage accuracies for all major projects due in the next three years of the AMP.

Table Q-2: Significant Project Estimate Accuracies

Project	Project Stage and Estimate Accuracy	Project Value in First 3 Years	Factors that Could Affect Estimate Accuracy
Richmond Water Treatment Plant	Concept / Feasibility	$8,650,000	DWSNZ:2005 (revised 2008) may require a higher level of treatment than costed. Turbidity levels and general water quality may affect treatment requirements.
Pohara Water Treatment Upgrade	Concept / Feasibility	$483,200	DWSNZ: 2005 (revised 2008) may require a higher level of treatment than costed. Turbidity levels and general water quality may affect treatment requirements.
Murchison Water Treatment Upgrade	Concept / Feasibility	$584,400	DWSNZ: 2005 (revised 2008) may require a higher level of treatment than costed. Turbidity levels and general water quality may affect treatment requirements.
Richmond Rezoning	Preliminary Design / Investigation	$1,139,300	Ground conditions. Clashes with other services, working within the CBD. Night time shutdowns may be required.

Q.1.11. Changes in Legislation and Policy

The legal and planning framework under which local government operates is ever changing. This can significantly affect the feasibility of projects, how they are designed and constructed and how they are funded.

The most significant change in legislation that has been incorporated into this AMP is the need for compliance with DWSNZ:2005 (revised 2008). The projects have been programmed to meet the requirements where possible, but in some cases, Council feel they will be able to prove all practicable steps are in place to meet compliance deadlines, thereby allowing negotiation with MoH on the timing.

Other than above, it has been assumed that there will be no major changes in legislation or policy. If significant changes occur it is likely to have a significant impact on the required expenditure. Council has not mitigated the effect of this.

Q.1.12. Water Source Quantity and Quality

Council will be able to find and develop water sources of sufficient quality and quantity to meet the needs of Richmond and Wakefield. If the proposed water sources do not have sufficient water to cope with the projected demand, Council will need to investigate new source locations, this could have an effect on the timing and cost of the jobs. If the water quality is poor, ie, high nitrate levels, then the cost of treatment may increase.

Q.1.13. Changes in the Fire Fighting Standards

The NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 was updated in 2008.

Modelling had been undertaken in various water supplies in 2007 to confirm whether the networks met the 2003 fire fighting standard. Since the introduction of the 2008 standard, only Richmond has been modelled to check compliance with this standard. An allowance has been made in this AMP to confirm whether the rest of the urban water supplies meet the standard. In the event new areas do not, additional projects may need to be introduced to meet the standard.

Q.1.14. Resource consent

That Council will be granted resource consents for key capital works projects, including consent to abstract water from the Motueka aquifers to supply Motueka, Mapua and the CTA areas, and renewal of existing resource consents for existing assets. Council has been granted a consent for Motueka but this has been appealed to the Environment Court. If Council does not get this consent granted, Council will have to consider alternative arrangements for supplying these communities.

Q.1.15. Motueka Water Supply Subsidy

That Council will be granted a subsidy to help fund the proposed Motueka water supply when it reapplies towards the end of the 10 year period. Council applied for a government subsidy towards the Motueka Water Supply project in 2010, but was unsuccessful at that stage. Council will have to consult with the community to determine whether the project proceeds or whether alternative arrangements are made. Therefore, the project has been deferred until Year 9 to enable council to re-examine the options available to it and to consider re-applying for a government subsidy at a later date.

Q.1.16. Disaster Fund Reserves

That the level of funding held in Council's disaster fund reserves and available from insurance cover will be adequate to cover reinstatement following emergency events. The risk of inadequate reserves and recovery from insurance claims would mean deferral of future capital projects to provide any financial shortfall required to cover reinstatement costs.

Q.2 Risk Management

Council has adopted an Integrated Risk Management (IRM) framework and process as the means for managing risk within the organisation. The process integrates with the LTP process as illustrated in Figure Q-1.

The strategic goal of integrated risk management is: "To integrate risk management into Council's organisational decision making so that it can achieve its strategic goals cost effectively while optimising opportunities and reducing threats."

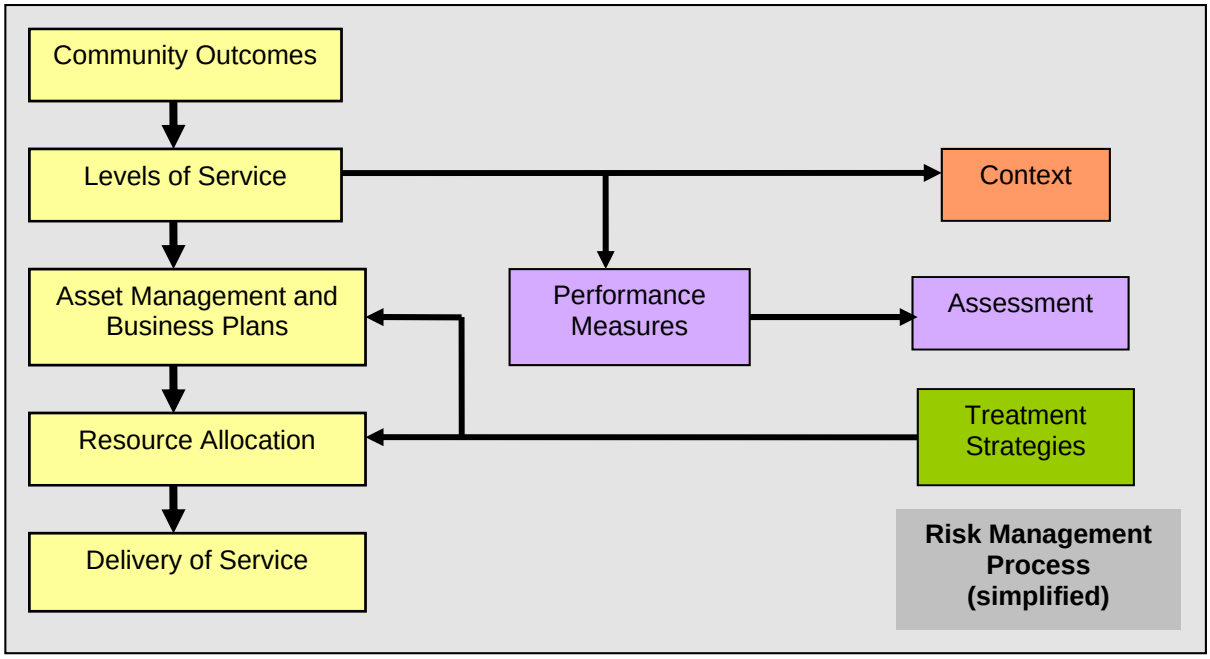


Figure Q-1: Integration of Risk Management Process into LTP Process

The IRM process and framework is intended to:

- to demonstrate responsible stewardship by Council on behalf of its customers and stakeholders
- to act as a vehicle for communication with all parties with an interest in Council's organisational and asset management practices
- provide a focus within Council for on-going development of good management practices
- demonstrate good governance
- meet public expectations and compliance obligations
- manage risk from an organisational perspective
- facilitate the effective and transparent allocation of resources to where they will have most effect on the success of the organisation in delivering its services.

The risk management framework adopted by Council is consistent with AS/NZS 4360:2004 Risk Management and assesses risk exposure by considering the consequence and likelihood of each risk which is identified as having an impact on the achievement of organisational objectives (Figure Q-2).

Whilst the IRM framework has been adopted within Council, it is primarily used as a process within the individual activities. Council are working towards developing it into a more formally integrated process throughout the whole organisation.

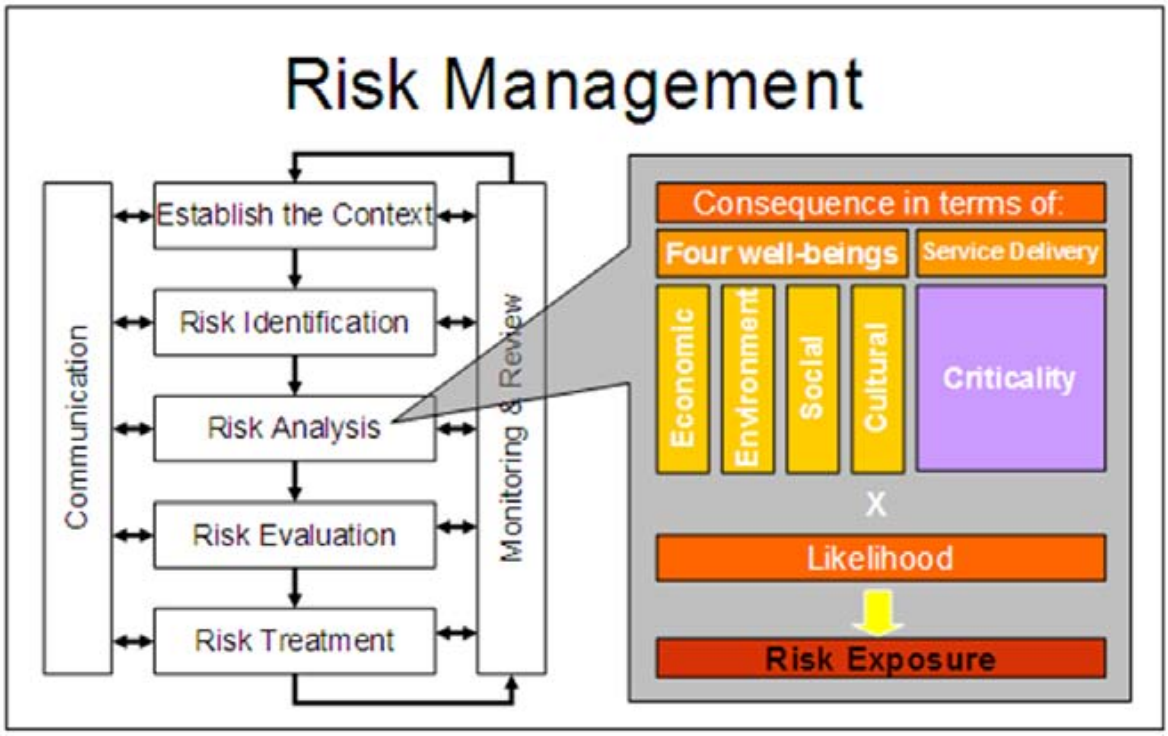


Figure Q-2: Integrated Risk Management Process

Consequence categories have been developed to reflect the impact of risk events on the four well-beings and each consequence category is scored as either “extreme”, “major”, “medium”, “minor”, or “negligible”. These categories address common consequences across any asset or project, however, they do not specifically account for the differences in assets. Therefore an additional category “Service Delivery” is used to reflect the essential reason for the ownership or management of any asset within the local authority – the delivery of a service. This means that the consequence of failure to deliver the service in question (the criticality of the service) can be used to weight the consequences to reflect the relative importance of the asset to the community and in turn to Council. Descriptions of the Consequence Categories are detailed in Table Q-3.

Table Q-3: Consequence Categories

Category		Description
Service Delivery		Assessment based on the asset's compliance with Performance Measures and value in relation to outcomes and resource usage.
Social/ Cultural	Health and Safety	Assessment of impact as it relates to death, injury, illness, life expectancy and health.
	Community Safety and Security	Assessment of impact based on perceptions of safety and reported levels of crime.
	Community / Social / Cultural	Assessment of impact based on damage and disruption to community services and structures, and effect on social quality of life and cultural relationships.
	Compliance / Governance	Assessment of effect on governance and statutory compliance of Council.
	Reputation / Perceptions of Council	Assessment of public perception of Council and media coverage in relation to Council.
Environment	Natural Environment	Effect on the physical and ecological environment, open space and productive land.
Economic	Direct Cost / Benefit	Direct cost (or benefit) to Council.
	Indirect Cost / Benefit	Direct cost (or benefit) to wider community.

Similarly, the likelihood of the risk occurring is scored on a scale from "almost certain" to "unlikely" with associated probabilities and frequencies provided for guidance.

The risk exposure is then determined for each identified risk by multiplying the consequence and likelihood, and is presented using semantic descriptions ranging from "extreme" to "negligible".

Treatment strategies, or strategic plans, that mitigate each risk can then be identified, and prioritised based on the risk exposure.

The consequence, likelihood scoring and risk matrix tables are all located in a separate report, Council Integrated Risk Management - Engineering Activities. This document also contains the outputs from the Level 1 and Level 2 Risk Assessments.

There are essentially three levels of risk assessment that should be considered for each activity within Council:

- Level 1 - Organisational Risk Assessment
- Level 2 - Activity Management Risk Assessment
- Level 3 - Critical Asset Risk Assessment.

Q.2.1. Level 1 - Organisational Risk Assessment

The Organisational Risk Assessment focuses on identification and management of significant operational risks that will have an impact beyond the activity itself and will affect the organisation as a whole. This approach allows the Integrated Risk Management framework to address risks at the organisational level, as well as at both the management and operational levels within the particular Council activities.

During the process of developing the integrated risk management process, Council identified a number of risk events and issues at organisational level. These are relatively generic across all activities, but have been reviewed against each particular activity to ensure relevance and adjusted to suit. The decision to implement the treatment measures identified will be at an organisational level, not activity level.

Q.2.2. Level 2 – Activity Management Risk Assessment

The Activity Management Risk Assessment uses the same principal and consequence tables, but the focus has been at more detailed level. During this process, specific risk events were identified which would affect the operational ability or management of the activity as a whole. If an individual system within the activity was identified as being at a greater risk or would need to be managed in a different way to the rest of the systems, then it was highlighted for separate consideration.

The outcome from this process is summarised below. Table Q-4 shows the Current Risk Profile of the water activity. By undertaking the Asset Management Activities and Projects detailed, Council will reduce their Risk Profile to that shown in By undertaking the projects and asset management activities detailed below, Council can reduce their risk profile to that shown in Table Q-5.

Table Q-5.

Proposed controls falling under the Operational Project, Capital Project or Strategic Study categories have been included within the Financial Forecasts. Those identified as Asset Management Activities will need to form part of the Council's general asset management and have been included in the Improvement Plan to ensure they are not overlooked.

Table Q-4: Current Risk Profile

RISK MATRIX - WATER CURRENT RISK						
		CONSEQUENCE				
		Negligible (+/-1)	Minor (+/-10)	Medium (+/-40)	Major (+/-70)	Extreme (+/-100)
LIKELIHOOD	Almost Certain (5)					
	Likely (4)		8	1		
	Possible (3)	1	37	3	1	
	Unlikely (2)		13		1	
	Very Unlikely (1)		8	5	2	

Asset Management Activity

- Test Emergency Management Plan
- Review Wai-iti Dam Emergency Action Plan
- Designs to minimise fire potential
- Designs to include for animal proofing
- Designs to allow for manual operation
- Improve HAZOPs
- Regular communication with health authorities to identify critical users.

Operational Project

- Test existing backflow protection
- Review existing fire controls at water treatment plants
- Leak detection programme.

Capital Project

- Install backflow protection where needed
- Wellhead protection improvements.

Strategic Study

- Identify critical mains
- Develop policy on who owns and maintains backflow protection assets
- Investigate new water sources for Richmond/Waimea.

By undertaking the projects and asset management activities detailed below, Council can reduce their risk profile to that shown in Table Q-5.

Table Q-5: Target Risk Profile

RISK MATRIX - WATER TARGET RISK						
		CONSEQUENCE				
		Negligible (+/-1)	Minor (+/-10)	Medium (+/-40)	Major (+/-70)	Extreme (+/-100)
LIKELIHOOD	Almost Certain (5)					
	Likely (4)		7			
	Possible (3)	1	32			
	Unlikely (2)		21		1	
	Very Unlikely (1)		8	9	1	

During the risk assessment process, it was noted that there are some risk events which will remain with a Target Risk of High (detailed in Table Q-6). This is a result of either no proposed controls identified, or those that are identified would not achieve the requisite reduction in risk. The Risk Events remaining with a High Target Risk need to be monitored to determine either; that Council remain comfortable with the Target Risk Level or; if there are any additional proposed controls which could be implemented to reduce the Target Risk Level further.

Table Q-6: Target Risk Level Remaining High

Risk	Risk Description	Scope	Current Control	Current Risk Level	Proposed Control	Target Risk Level
Integration						
Iwi	Ineffective relationship impacts operations and maintenance and renewal works	Coastal / culturally sensitive areas	Regular meetings	HIGH	Monitor	HIGH
Natural Hazards						
Earthquake (1:400)	Significant damage to infrastructure	District	Seismic protection for reservoirs. Reticulation planning. Hazard register. Lifelines planning	HIGH	Review planning. Consider retrofitting additional infrastructure	HIGH

Q.2.3. Level 3 – Critical Assets Risk Assessment

Critical assets and those assets considered to be significant within each water supply scheme have been identified. A high level risk assessment was undertaken to determine the issues arising from each asset group that may prevent delivering of the required service. Treatment strategies that mitigate each risk for the asset groups were then identified.

Individual risk assessments have not been carried out for each of the assets; however, they have been assessed against the set of mitigation measures. At this level of risk assessment, the risk events considered are physical events only as the management and organisational risk events formed part of the earlier stages of risk assessment.

Table Q-7following lists the critical and significant assets for each water supply scheme. Where a mitigation measure is felt to be necessary, a capital or operational project has been identified and included in the financial forecasts.

Table Q-7: Critical and Significant Assets

Identified as Critical Main in C688
Not identified as Critical Asset

Key
Measure to be considered
Measure in place
No measure in place - not necessary
No measure in place - Project needed

Water Supply Scheme	Asset Group	Critical and Significant Asset	Project ID	Project Name	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
District	All	All	SS 48	Land Easement on Rural Water Schemes																				
			SS 44	Water System Operating Plans																				
			SS 45	Inspection of significant assets																				
			159	Telemetry status study																				
			194	Backflow Prevention at key sites																				
			SS 46	Inspection of all water retaining structures																				
Richmond	Source	Lower Queen Street Bores	125	New groundwater source																				
		Appleby Bore																						
		Roding Dam (not TDC asset)																						
	Treatment Plant	-	156	New WTP																				
	Reservoirs	Queen Street Main Reservoir																						
		Richmond High Level Reservoir	136	Seismic Remediation																				
		Valhalla High Level Reservoir	136	Seismic Remediation																				
		Faraday Rise Reservoir	159	Telemetry																				
		Haycock Rd Reservoir	159	Telemetry																				
	Pump Stations	Headworks - Appleby Well																						
		Headworks - Queen Street																						
		Queen Street Main Reservoir PS																						
		Cropp Place PS	159	Telemetry																				
		Valhalla PS																						
		Hill Street South PS																						
	Critical Mains	***Queen Street Bores - Queen Street Reservoir***	110/129 131/209	Rezoning- Cambridge St link to Queen Street & Queen Street watermain replacement & Queen Street Roundabout																				
		Queen Street Reservoir - Richmond High Level Reservoir																						
Waimea	Source	Waimea Bores																						

	Treatment Plant	Waimea Treatment Plant	156	New WTP	
	Reservoirs	Champion Road Reservoir			
		Champion Road High Level Reservoir	136	Seismic Remediation	
	Pump Stations	Headworks - Waimea Bores			
		Waimea Treatment Plant and PS			
		Champion Road PS			
	Critical Mains	Waimea Bores - WTP			
		Waimea WTP - Champion Rd Main Reservoir	150	Richmond East - Champion Road	
		Main serving major industry (enza etc.)			
Mapua / Ruby Bay	Source	Waimea Bores			
	Treatment Plant	Waimea Treatment Plant			
	Reservoirs	Pomona Road Reservoir			
		Pine Hill Heights Reservoir			
		Old Coach Road Reservoir			
	Pump Stations	Queen Street Pumps			
		Mapua Booster PS			
		Pinehill Reservoir PS			
		Brabant Drive PS			
		Pomona Road PS			
	Critical Mains	***Waimea Bores - Mapua Booster PS***			
		Mapua Booster PS - Pomona Rd Reservoir	53	Aranui main replacement	
		Mapua Booster PS - Pomona Rd Reservoir (along Seaton Valley Road)			
		Pomona Road Reservoir - Old Coach Reservoir			
Wakefield	Source	Wakefield Bore and Infiltration Gallery	184	New Source Construction	
	Treatment Plant	Wakefield WPT			
	Reservoirs	Wakefield Reservoir			
	Pump Stations	Wakefield Wells PS			
		Wakefield WTP PS			
		Brightwater Link PS			
		Treeton Place PS	159	Telemetry	
	Critical Mains	Wells - WTP			
		WTP - Wakefield Reservoir			
Brightwater	Source	Brightwater Bores	15	supplementary bore	
	Treatment Plant	Brightwater WTP	18	WTP upgrade	
	Reservoirs	Brightwater Reservoir			
		Teapot Valley	159	Telemetry	
		New Brightwater Res			

	Pump Stations	Wellfield Lightband Road			
		Brightwater Main PS			
		Teapot Valley PS			
	Critical Mains	Wellfield - WTP			
		WTP - Brightwater Main Reservoir			
Tapawera	Source	Bores			
	Treatment Plant	Tapawera WTP			
	Reservoirs	WTP storage			
	Pump Stations	Main Road PS			
		Highlift PS			
	Critical Mains	Tadmor Valley Road PS - Tapawera Reservoir			
		Main Road Tapawera (school)			
Murchison	Source	Matakitaki River bores			
	Treatment Plant	WTP	87	WTP upgrade	
	Reservoirs	Chalgrave Street Reservoirs	159	Telemetry	
	Pump Stations	Fairfax Street Main PS			
	Critical Mains	Bores - Fairfax Street Main PS			
		Main PS - Waller Street			
		Waller Street (Fairfax Street - Chalgrave Street)			
		Chalgrave Street (Waller Street - Chalgrave St Reservoir)			
		Chalgrave Street Reservoir - Hotham Street			
		Hotham Street - Hospital			
Upper Takaka	Source	Whiskey Creek Surface Water	159	Telemetry	
	Treatment Plant	WTP			
	Reservoirs	Upper Takaka Reservoir			
	Pump Stations	-			
	Critical Mains	Intake - Reservoir			
		Reservoir - WTP			
Kaiteriteri	Source	River Road Bore	51	WTP Upgrade	
	Treatment Plant	WTP	51	WTP Upgrade	
	Reservoirs	Main Reservoir			
		High Level Reservoir			
	Pump Stations	River Road Well PS			
		Kaiteriteri High Level Booster PS			
		Kaiteriteri Lower Booster PS			
	Critical Mains	River Road Bore - Lower Booster PS			
		Lower Booster PS - Low Level			

		Reservoir			
		Low Level Reservoir - Camp Ground			
Collingwood	Source	Aorere River Bore			
	Treatment Plant	WTP	23	WTP upgrade	
	Reservoirs	Collingwood Reservoir			
	Pump Stations	Collingwood Bore PS			
		Collingwood PS			
	Critical Mains	Aorere River Bore - WTP			
		WTP - Collingwood Reservoir			
88 Valley	Source	Parkes Stream			
	Treatment Plant	WTP	7	WTP upgrade	
	Reservoirs	88 Valley Tanks	189	Wakefield & 88 Valley Upgrades	
	Pump Stations	-			
	Critical Mains	Intake - Totara View Rd Reservoir	4	intake access and pipeline renewal	
Dovedale	Source	Humphries Creek	31	New source and WTP	
	Treatment Plant	WTP	31	New source and WTP	
	Reservoirs	Neudorf Saddle BP tank			
		Knots Reservoir	159	Telemetry	
		Silcocks Reservoir			
		Te Hepe Top Reservoir	159	Telemetry	
		Winns Reservoir			
		Te Hepe Lowere Reservoir			
		Thorns Reservoir			
	Pump Stations	Humphries Creek PS			
		Knots PS			
		Lower Tehepe PS			
		Upper Tehepe PS			
		Wins PS			
		Thorne PS			
	Critical Mains	High level intake - High level WTP	31	New source and WTP	
		High level WTP - Main Intake	31	New source and WTP	
		Main Intake - Main WTP	31	New source and WTP	
		Main WTP - Thorns Reservoir			
		Thorns Reservoir - Silcocks Reservoir			
Redwoods Valley	Source	Golden Hills Well			
		O'Connors Creek Wells			
		River Road Well			
	Treatment Plant	WTP - Golden Hills	104	WTP Upgrade	
		WTP - O'Connors Creek	105	WTP Upgrade	
	Reservoirs	Maisey High Level Reservoir			
		Maisey Road Reservoir 1			

		Maisey Road Reservoir 2			
		Redwoods High Level Reservoir			
		Redwood Malling Road BP tank			
	Pump Stations	River Road Well PS			
		O'Connors Creek Well PS			
		Golden Hills PS			
		Redwoods Booster PS 1			
		Redwoods Booster PS 2			
	Critical Mains	River Road Bore - Golden Hills PS			
		River Rd Bore - O'Connors Creek PS			
		Golden Hills PS - Redwoods Booster PS 1			
		Redwoods Booster PS 1 - Hbigh Level Reservoir			
		O'Connors Creek PS - Maisey Rd Reservoir			
		O'Connors Creek PS - Maisey Rd Reservoir			
Motueka	Source	Fearons Bush Bore			
		Rec Centre Bore			
	Treatment Plant	-	69	New town supply	
	Reservoirs	-	69	New town supply	
	Pump Stations	Fearons Bush PS			
		Fearons Bush Well PS			
		Rec Centre Well PS			
	Critical Mains	High Street (Parker Street - Whakarewa Street)	75	Naumai Street loop	
		Thorp Street	78	Thorpe Street Main replacement	
		Fearon Street (High Street - Thorp Street)	65	Fearon Street Mains Replacement	
		Old Wharf Road (High Street - Thorp Street)			
		High Street (King Edward Street - Hospital)	68	High Street South Main Renewal	
		Woodland Avenue			
Pohara	Source	Stream Intake	89 92	New Town Supply Treatment Upgrade	
	Treatment Plant	WTP	89 92	New Town Supply Treatment Upgrade	
	Reservoirs	Pohara Reservoir	89	New Town Supply	
	Pump Stations	Pohara Valley PS	159	Telemetry Upgrade	
	Critical Mains	Abel Tasman Drive	89	New Town Supply	
		WTP - Pohara Reservoir	89	New Town Supply	
		Source - WTP	90	intake - WTP main replacement	
Hamama	Source	Stream intake			
	Treatment	-	43	Individual household units	

	Plant																							
	Reservoirs	-																						
	Pump Stations	-																						
	Critical Mains																							

Q.2.4. Projects to Address Risk Shortfalls

The specific risk mitigation measures that have been planned within the 20 year water programme include:

- completing PHRMPs for all water supply systems
- a programme of telemetry installation and upgrade
- a programme of well head security improvements
- a programme of backflow installation
- seismic protection at key reservoirs
- inspection of water retaining structure throughout the district
- Wai-iti Dam safety audits
- hydraulic modelling.

Q.2.5. Asset Insurance

Tasman District Council has various mechanisms to insure assets against damage. These include:

1. Tasman District Council insures its above ground assets, like buildings, through private insurance which is arranged as a shared service with Nelson City and Marlborough District Councils.
2. Tasman District Council is a member of the Local Authority Protection Programme (LAPP) which is a mutual pool created by local authorities to cater for the replacement of some types of infrastructure assets following catastrophic damage by natural disasters like earthquake, storms, floods, cyclones, tornados, volcanic eruption, tsunami. These infrastructure assets are largely stopbanks along rivers and underground assets like water and wastewater pipes and stormwater drainage.
3. Taman District Council has a Classified Rivers Protection Fund, which is a form of self-insurance. The fund is used to pay the excess on the LAPP insurance, when an event occurs that affects rivers and stopbank assets.
4. Tasman District Council has a General Disaster Fund, which is also a form of self-insurance. Some assets, like roads and bridges, are very difficult to obtain insurance for or it is prohibitively expensive if it can be obtained. For these reasons Council has a fund that it can tap into when events occur which damage Council assets that are not covered by other forms of insurance. Some of the cost of damage to these assets is covered by central government, for example the New Zealand Transport Agency covers around half the cost of damage to local roads and bridges.

Q.2.6. Civil Defence Emergency Management

The Civil Defence Emergency Management Act 2002 was developed to ensure that the community is in the best possible position to prepare for, deal with, and recover from local, regional and national emergencies. The Act requires that a risk management approach be taken when dealing with hazards including natural hazards. In identifying and analysing these risks the Act dictates that consideration is given to both the likelihood of the event occurring and its consequences. The Act sets out the responsibilities for Local Authorities. These are:

- ensure you are able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency
- plan and provide for civil defence emergency management within your own district.

Tasman District Council and Nelson City Council deliver civil defence on a joint basis as the Nelson Tasman Civil Defence Emergency Management (CDEM) Group. The vision of the CDEM Group is to build “A resilient Nelson Tasman community”.

Civil Defence services are provided by the Nelson Tasman Emergency Management Office. Other Council staff are also heavily involved in preparing for and responding to civil defence events. For example, Council monitors river flows and rainfall, and has a major role in alleviating the effects of flooding.

At the time of writing, the Nelson Tasman Civil Defence Emergency Management Group released its Draft Regional Plan for community consultation. The Plan sets out how Civil Defence is organised in the region and describes how the region prepares for, responds to and recovers from emergency events.

Q.2.7. Engineering Lifelines

The Nelson Tasman Engineering Lifelines (NTEL) project commenced in 2002 and concluded in 2009 with a report and risk assessments titled *Limiting the Impact*. The purpose of the report was:

- to help the Nelson Tasman region reduce its infrastructure vulnerability and improve resilience through working collaboratively
- to assist Lifeline Utilities with their risk reduction programmes and in their preparedness for response and recovery
- to provide a mechanism for information flow during and after an emergency event.

The project was supported and funded by the two controlling authorities, Nelson City Council and Tasman District Council. Following the initial start-up forum in 2002, a Project Steering Group was formed and initial project work was completed. In 2008, the NTEL Group was formed. The initial work to investigate risks and assess vulnerabilities from natural hazard disaster events was divided amongst five task groups:

- Hazards Task Group
- Civil Task Group
- Communications Task Group
- Energy Task Group
- Transportation Task Group.

These groups were then tasked with assessing the risk and vulnerability of segments of their own networks against the impacts of major natural hazard disaster events. These natural hazards included:

- earthquake
- landslide
- coastal / flooding.

The Nelson Tasman region is geotechnically complex with high probabilities of earthquake, river flooding and landslides.

By identifying impacts that these hazards may have on the local communities, NTEL aim to have processes in place to allow the community to return to normal functionality as quickly as possible after a major natural disaster event.

To date the project has identified the impacts of natural hazards and the critical lifelines of the regions service networks including communication, transportation, power and fuel supply, water, sewerage, and stormwater networks.

The initial NTEL assessment work is the first stage of an on-going process to gain a more comprehensive understanding of the impacts of natural hazards in the Nelson Tasman region. The review date of the NTEL assessments is not rigidly set in place, but it is envisaged that a five-yearly on-going review period is appropriate with more frequent reviews and updates necessary and beneficial as new or updated relevant information becomes available.

Q.2.8. Recovery Plans

These plans are designed to come into effect in the aftermath of an event causing widespread damage and guide the restoration of full service.

The Recovery Plan for the Nelson Tasman Civil Defence and Emergency Management Group (June 2008) identifies recovery principles and key tasks, defines recovery organisation, specifies the role of the Recovery Manager, and outlines specific resources and how funds are to be managed.

Information about welfare provision in the Nelson Tasman region is contained in a Welfare Plan (December 2005), which gives an overview of how welfare will be delivered during the response and recovery phases of an emergency.

The plan is a coordinated approach to welfare services for both people and animals in the Nelson Tasman region following an emergency event.

Q.2.9. Business Continuance

Council has a number of processes and procedures in place to ensure minimum impact to water services in the event of a major emergency or natural hazard event:

- Council has limited business continuity plans that were developed around the influenza pandemic planning in 2006
- Council's water contractors have up to date Health and Safety Plans has an Emergency Response and Business Continuity Plan.

APPENDIX R. LEVELS OF SERVICE, PERFORMANCE MEASURES AND RELATIONSHIP TO COMMUNITY OUTCOMES

R.1 Introduction

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

The levels of service for Water Supply have been developed to contribute to the achievement of the stated Community Outcomes that were developed in consultation with the community, but taking into account:

- the Council's statutory and legal obligations
- the Council's policies and objectives
- the Council's understanding of what the community is able to fund.

R.2 How Do Our Water Supply Activities Contribute to the Community Outcomes?

Through consultation, the Council identified eight Community Outcomes. These Community Outcomes are linked to the four well beings and Council Objectives as shown in Table R-1.

Table R-1: Community Wellbeings, Outcomes, Council Objectives, Groups and Activities

Community Outcomes	Council Objectives	Council Groups of Activities	Council Activities
Community Wellbeing - Environmental			
Our unique natural environment is healthy and protected	To ensure sustainable management of natural and physical resources and security of environmental standards.	Environment and Planning	• Resource Policy • Environmental Information • Resource Consents and Compliance • Environmental Education, Advocacy and Operations • Regulatory services • Rivers and Flood Management
Our urban and rural environments are pleasant, safe and sustainably managed.			
Our infrastructure is safe, efficient and sustainably managed.	To sustainably manage infrastructural assets relating to Tasman district.	Transportation	• Regional Cycling and Walking Strategy • Land Transportation • Coastal Structures • Aerodromes
		Sanitation, drainage and water supply	• Solid Waste • Wastewater • Stormwater • Water Supply

Community Outcomes	Council Objectives	Council Groups of Activities	Council Activities
Community Wellbeing - Social and Cultural			
Our communities are healthy, resilient and enjoy their quality of life.	To enhance community development and the social, natural, cultural and recreational assets relating to Tasman district.	Cultural services and grants.	• Cultural services and community grants
Our communities respect regional history, heritage and culture.		Recreation and leisure	• Community recreation • Camping grounds • Libraries • Parks and Reserves
Our communities have access to a range of cultural, social, educational and recreational services.			
Our communities engage with Council's decision-making processes.		Community support services	• Community facilities • Emergency management • Community housing • Governance
Community Wellbeing - Economic			
Our developing and sustainable economy provides opportunities for us all.	To implement policies and financial management strategies that advance. To promote sustainable development in the Tasman district.	Council Enterprises	• Forestry • Property • Council controlled organisations.

The table below (Table R-2) describes how the water supply activities contribute to the Community Outcomes.

Table R-2: How Water Supply Activities Contribute to Community Outcomes

Community Outcomes	How Our Water Supply Activity Contributes to the Community Outcome
Our unique natural environment is healthy and protected.	All water in the Council-owned schemes is taken from the environment. This activity can be managed so the impact of the water take does not prove detrimental to the surrounding environment.
Our urban and rural environments are pleasant, safe and sustainably managed.	The water supply activity is a service to the community providing water that is safe to drink and is efficiently delivered to meet customer needs. It also provides a means for fire fighting consistent with the national fire fighting standards.
Our infrastructure is safe, efficient and sustainably managed.	The water activity is considered an essential service that should be provided to all properties within water supply network areas in sufficient capacity and pressure. This service should also be efficient and sustainably managed.

R.3 Level of Service

Levels of service are attributes that Tasman District Council expects of its assets to deliver the required services to stakeholders.

A key objective of this plan is to clarify and define the levels of service for the water assets, and then identify and cost future operations, maintenance, renewal and development works required of these assets to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

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

- ***Customer Research and Expectations:*** Information gained from stakeholders on expected types and quality of service provided.

- ***Statutory Requirements:*** Legislation, regulations, environmental standards and Council By-laws that impact on the way assets are managed (ie. resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service to be provided.

- ***Strategic and Corporate Goals:*** Provide guidelines for the scope of current and future services offered and manner of service delivery, and define specific levels of service, which the organisation wishes to achieve.

- ***Best Practices and Standards***: Specify the design and construction requirements to meet the levels of service and needs of stakeholders.

R.3.1. Industry Standards and Best Practice

The AMP acknowledges Council's responsibility to act in accordance with the legislative requirements that impact on Council's water activity. A variety of legislation affects the operation of these assets, as detailed in Appendix A.

R.3.2. Prioritisation related to available resources

With water assets, there are often higher levels of maintenance and renewal requirements proposed (increased Levels of Service etc) than the resources allow for. Tradeoffs then have to be made as to what impacts on the ability of an asset to provide a service against the nice to have aspects.

R.4 What Level of Service Do We Seek to Achieve?

The levels of service that the Council has adopted for this AMP have been developed from the levels of service prepared in the July 2006 and July 2009 Activity Management Plans. They take in account feedback from various parties including Audit New Zealand, industry best practice and ease of measuring and reporting of performance measures.

Council has decided to reduce the number of levels of service reported in the LTP, showing only those that are considered to be Customer Focussed. The AMP extends the levels of service and performance measures to include the more technical performance measures associated with the management of the activity.

Table R-3 details the levels of service and associated performance measures for the water activity. Those shaded are the customer focussed measures which are included in the LTP. The table sets out Council's current performance and the targets they aim to achieve within the next three years and by the end of the next 10 year period.

The Levels of Service and performance measures are consulted on and adopted as part of the Long Term Plan consultation process.

R.5 What Plans Have Council Made to Meet the Levels of Service

In preparing the future financial forecasts, Council have included specific initiatives to meet the current or intended future levels of service.

Council is making a capital works investment of over $115 million over the next 20 year period to upgrade existing water supply assets and improve levels of service. This includes the following specific schemes:

- new source and treatment for the Dovedale scheme to remove the permanent Boil Water Notice
- a programme of water treatment upgrades in line with the recommendations outlined in the PHRMPs to ensure compliance with DWSNZ:2005 (revised 2008)
- increasing the capacity of the reticulation in the Richmond region to allow for the predicted future growth
- improving the water balance supply and level of service in Richmond during the peak demand
- new town water supplies to be constructed at Motueka, Pohara and Marahau, dependent on the outcome of community consultation
- installation of telemetry at key sites throughout the district
- installation of backflow prevention devices
- seismic strengthening of reservoirs.

In addition to the capital works, Council has allocated a budget of over $73 million over the 20 year period for the operation and maintenance of its current and future water supply assets. This allocation includes for professional services for investigative work and studies such as:

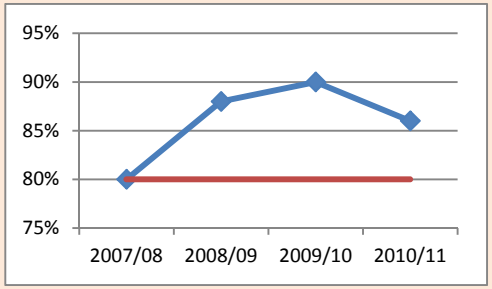
- production of a PHRMP for each of the Council owned water supplies.
- implementation of a demand management plan, including further demand analysis, pressure management, leak detection programme and water demand initiatives.
- hydraulic modelling of several urban water supply systems
- water system operating plans
- night flow monitoring
- fire hydrant audit.

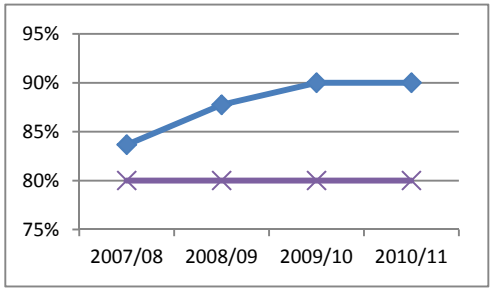
Table R-3: Assessment of Current Performance against Levels of Service and Intended Future Performance

ID	Levels of Service (we provide)	Performance Measures (We will know we are meeting the level of service if…)	Current Performance	Future Performance			Future Performance (targets) by Year 10 2021/22
				Year 1	Year 2	Year 3	
				2012/13	2013/14	2014/15	
Community Outcome: Our unique natural environment is healthy and protected.							
1	**Our water takes are sustainable.**	All water takes have resource consents. All resource consents are held in Confirm.	**Actual = 100%** A current resource consent is in place for each water take. No abatement notices had been received for breach of resource consent conditions.	*100%*	*100%*	*100%*	*100%*
2	**Our use of the Water Resource is efficient.**	Water demand management plans are in place for each water scheme - as measured by having a Demand Management Plan.	**Actual = 5/16** Demand Management Plans are in place for Richmond, Brightwater/Hope, Wakefield, Mapua/Ruby Bay and for Waimea.	*6/16*	*8/16*	*10/16*	*12/16*
3		*The weighted average of metered residential consumption across the district reduces.* *As measured through Council's district-wide Water Demand Management Plan.*	**Actual =** 196 l/capita/day	*<250l/capita/day*	*<250l/capita/day*	*<250l/capita/day*	*<250l/capita/day*
4		*The weighted average of measured water loss across the district reduces.* *As measured through Council's district-wide Water Demand Management Plan.*	**Actual =** 239 l/connections/day	*<235l/connection/day*	*<230l/connection/day*	*<225l/connection/day*	*<175l/connection/day*
Community Outcome: Our urban and rural environments are pleasant, safe and sustainably managed.							
5	**Our water is safe to drink.**	Number of temporary advisory notices issued to boil water - as issued in consultation with the Medical Officer of Health.	**Actual = 2** Motueka due to a bacterial contamination and Pohara due to plant failure. There is a permanent notice in place at Dovedale, which is not covered in the targets as it is permanently in place.	*0*	*0*	*0*	*0*
6		There are no bacterial non-compliances	**Actual = 5**	*0*	*0*	*0*	*0*

ID	Levels of Service (we provide)	Performance Measures (We will know we are meeting the level of service if…)	Current Performance	Future Performance			Future Performance (targets) by Year 10 2021/22
				Year 1 2012/13	Year 2 2013/14	Year 3 2014/15	
		for water supplies - as measured by water sampling and analysis to meet DWSNZ, recorded in Water Information New Zealand.	Bacterial contamination - three transgressions were recorded for *E.coli.* Plant - two transgressions were recorded for *E.coli.* Council carries out water compliance testing on all of its public water supplies to DWSNZ: 2005 (revised 2008). If a transgression occurs, further samples are taken and an investigation begins.				
7		*P1 and P2 monitoring shows we are in compliance with DWSNZ.* *As measured by water sampling and analysis to meet DWSNZ, recorded in WINZ.*	**Actual = 98.5%** Zone – 783 samples were taken over the year. Of these, three transgressions were recorded for *E.coli* and 19 transgressions recorded in Richmond for nitrate = 97.2% Plant – 764 samples were taken over the year. Of these, two transgressions were recorded for *E.coli*. = 99.7%	100%	100%	100%	100%
8		*PHRMPs are in place, approved and being implemented for each water supply.* *As measured by approval by Ministry of Health.*	**Actual = 5/16** PHRMPs approved for Tapawera, Upper Takaka and Motueka, Waimea, Richmond Two further ready for submission (Wakefield, Brightwater) and one in appeal (Collingwood).	10/16	13/16	14/16	16/16
9	**Our water supply systems provide fire protection to a level that is consistent with the national standard.**	Urban water supply systems are able to meet FW2 standard Code of Practice for Fire Fighting Water Supplies - as measured through hydraulic modelling, revised biennially.	**Actual = 90%** 9/10 urban systems fully comply with fire fighting capability. The vast majority of Richmond complies, with the exception of Cropp Place. Rural water supplies and community supplies do not provide fire fighting capacity so are not covered by this performance measure, however, a	*90%*	*90%*	*90%*	*100%*

ID	Levels of Service (we provide)	Performance Measures (We will know we are meeting the level of service if…)	Current Performance	Future Performance			Future Performance (targets) by Year 10 2021/22
				Year 1 2012/13	Year 2 2013/14	Year 3 2014/15	
			reticulated fire fighting scheme for the central business district in Takaka was completed in 2011 and Motueka has a network of fire wells which provide a limited fire fighting service.				
10		*Planned service interruptions do not exceed four hours.* *As measured through the maintenance contract.*	**Actual = 0** No planned service interruptions have exceeded four hours.	0	0	0	0
11		*Flow from hydrants meets fire fighting standards.* *As measured by random annual spot checks of hydrants.*	**Actual = This is not currently being measured.** Budget assigned in AMP to undertake programme of hydrant spot checks.	100%	100%	100%	100%
12		*No system shall be down for longer than two hours per week.* *As measured through the Maintenance contract.*	**Actual = 0** No system has been interrupted for more than two hours in any one week	0	0	0	0
13		*Hydraulic models are in place for key urban water supplies.* *As measured through professional services contracts.*	**Actual = 6 hydraulic models are in place** for Richmond, Waimea, Brightwater, Wakefield, Mapua, Motueka.	6 / 10	6 / 10	6 / 10	8 / 10
Community Outcome: Our infrastructure is safe, efficient and sustainably managed.							
14	**Our water supply activities are managed at a level that the community is satisfied with.**	% of customers are satisfied with the water supply service - as measured through the annual residents' survey.	**Actual = 86%** The Communitrak™ survey was undertaken in May/June 2011. 86% of receivers of the service were found to be satisfied with the service they receive.	*80%*	*80%*	*80%*	*85%*

ID	Levels of Service (we provide)	Performance Measures (We will know we are meeting the level of service if…)	Current Performance	Future Performance			Future Performance (targets) by Year 10 2021/22
				Year 1 2012/13	Year 2 2013/14	Year 3 2014/15	
							
15	**Our systems are built, operated and maintained so that failures can be managed and responded to quickly.**	% of faults responded to within contract timeframes (e.g. Emergency = service restoration and four hours. Urgent = service restoration in one working day) - as recorded through Council's Confirm database.	**Actual = 97%** The operations and maintenance contractor is required to meet a target of 90% of faults to be responded to and fixed within specified timeframes. The figure reported here relates to completion within the final completion timeframe. More detailed response timeframes are monitored through contract 688.	*>90%*	*>90%*	*>90%*	*>90%*
16		*Critical assets are identified and included in the Activity Risk Register.*	**Actual = Critical assets are identified and assessed for Risk** Where mitigations measures are required, they have been included for action in the AMP.	In Place	In Place	In Place	In Place

ID	Levels of Service (we provide)	Performance Measures (We will know we are meeting the level of service if…)	Current Performance	Future Performance			Future Performance (targets) by Year 10 2021/22
				Year 1 2012/13	Year 2 2013/14	Year 3 2014/15	
17		*Water supply systems have the following storage:* *Urban: - one day at average annual demand* *Rural: - six hours at average annual demand* *As measured through annual demand figures vs actual storage.*	**Actual = 12 of the 13 schemes have the required storage** All three rural schemes meet storage requirements. Nine of the 10 urban supplies meet the required storage. Richmond fails to meet the requirement. Schemes are identified within the AMP to construct new reservoirs in this area. Tapawera failed to meet the required storage volume previously, however, significant reduction in water loss through leaks in this system have been resolved	13/13	13/13	13/13	13/13
18		*Assets are operated, maintained and repaired to a high standard.* *As measured through audits carried out by the Engineer*	**Actual = 90.6%** 	80%	80%	80%	80%

The levels of service and performance measures are consulted on and adopted as part of the Long Term Plan consultation process.

APPENDIX S. COUNCIL'S DATA MANAGEMENT, ASSET MANAGEMENT PROCESS AND SYSTEMS

S.1 Introduction

This Activity Management Plan has been developed as a tool for Council to describe how they intend to manage their assets, meet the levels of service agreed with the community and to explain the expenditure and funding requirement. It forms part of Councils Asset Management Process which is in general alignment with the International Infrastructure Management Manual (IIMM) as shown below in Figure S-1.

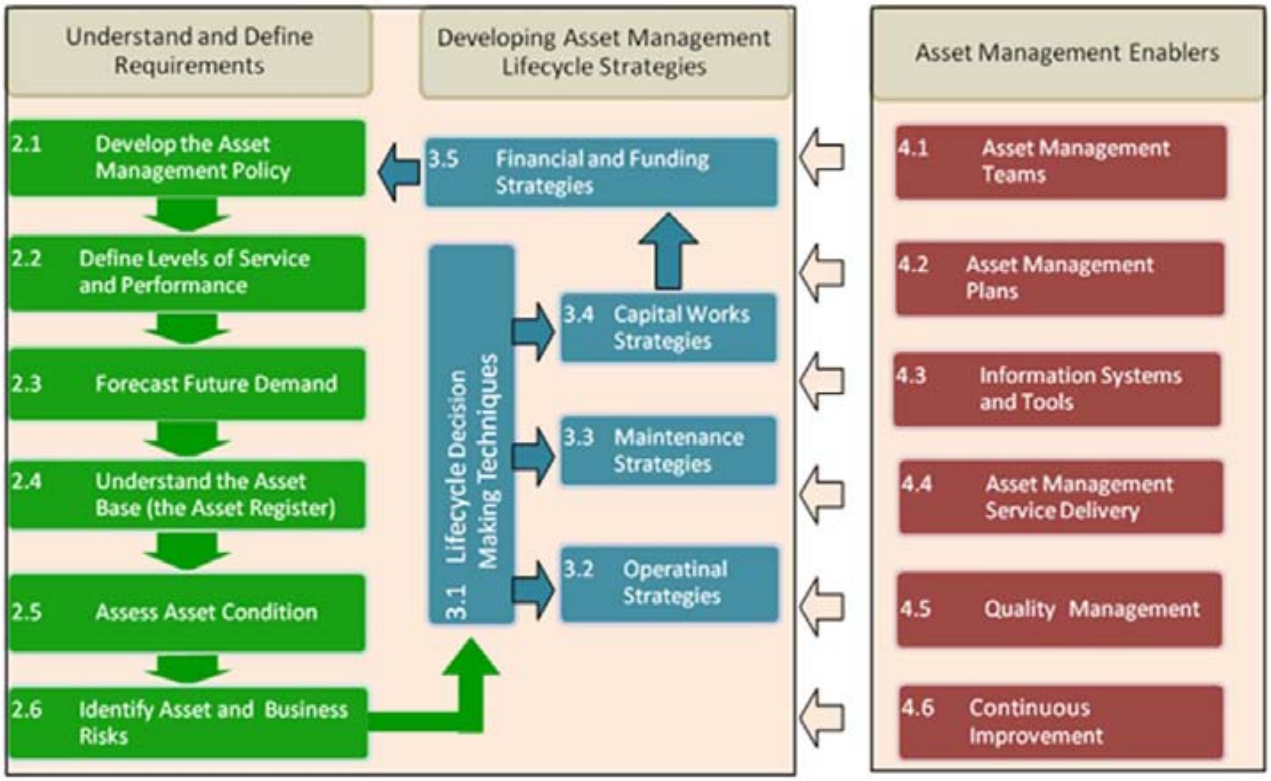


Figure S-1: The Asset Management Process

S.2 Understanding and Defining Requirements

S.2.1. Develop the Asset Management Policy

S.2.1.1 Selecting the Appropriate Level of Asset Management

The Asset Management Policy provides the direction as to the level of Asset Management expected and can differ between activities. Council underwent a process in 2010 with asset management consultants Waugh Infrastructure Management Ltd in which they identified the appropriate level of asset management to target for their engineering activities. During this process, Council and consultant staff assessed a range of parameters to establish the base level of asset management to provide the community for each activity including:

- district and community populations
- issues affecting the district and each activity
- the costs and benefits to the community

- legislative requirements
- the size, condition and complexity of the assets
- the risk associated with failures
- the skills and resources available to the organization
- customer expectation.

IIMM (2006) identified two levels of asset management; Core and Advanced. Waugh Infrastructure Management Ltd classed the transition between the two as being Core Plus. Core Plus is above Core asset management but below being fully compliant with Advanced asset management and can vary between Core with one or two Advanced categories, through to being substantially or fully compliant with most of the Advanced categories. In the IIMM (2011), Core Plus is now classified as 'intermediate'.

Upon completion of the process, Council have set **Core Plus** as the target level at which they want to be managing the Water Activity**.** The detail of required category compliance is under separate cover (Selecting the Appropriate Asset Management Level, Waugh August 2010).

S.2.1.2 Performance Review of Water Supply Activity Management Practices

Council underwent a process at the end of the 2009 AMP to undertake a high level review of the AMPs and associated activity management processes against good practice asset management as described in the IIMM and in accordance with the Office of Auditor General. During this process, the AMP and associated practices were scored to give a snap shot of the current status and then set targets as to where Council wished to head. The 2009 AMP Improvement Plan was assessed in its effectiveness to close the gap between actual and target compliance levels and new items added to the Improvement Plan where gaps were identified.

The results of the review are detailed under separate cover (Performance Review of Water Supply Activity Management Processes, MWH New Zealand Ltd February 2010).

The two reviews described above were carried out independently of each other however the outputs from both were compared to ensure consistency of recommendations. Whilst both reviews focused on slightly different aspects of asset management practices, there was no conflict between the recommendations made. Table S-1 below shows analysis undertaken to link the two reviews to identify the compliance gaps and actions that should be undertaken to address them.

Table S-1: Analysis of Asset Management Reviews

	Three Waters		
	CORE PLUS	**Compliance Status**	**Compliance Gaps to Address to meet CORE PLUS**
Description of Assets	Advanced	Substantially compliant	Action: Improve level of performance data in Confirm.
Levels of Service	Core	Higher level of compliance then suggested	There is substantial communication of LoS with the public.
Managing Growth	Advanced	Substantially compliant	Action: Improve level of demand strategies for Wastewater and Stormwater.
Risk Management	Advanced	Substantially compliant	Action: Improve integration with maintenance and replacement Strategies.
Lifecycle Decision Making	Advanced (with the exception of predictive modelling)	Partially compliant	Action: Improve evaluation tools. Unlikely to achieve Fully Compliant by LTP 2012.
Financial Forecasts	Advanced (with the exception of sensitivity testing of forecasts)	Compliant	No plans to undertake sensitivity testing of forecasts.
Planning Assumptions and Confidence Levels	Advanced	Substantially compliant	Action: Improve confidence and accuracy of asset data and performance.
Outline Improvement Programmes	Advanced	Substantially compliant	Action: identify timeframes and resources for Improvement Plan actions.
Planning by Qualified Persons	Core	Compliant	Intending to achieve Advanced by undertaking Peer Review.
Commitment	Advanced	Substantially compliant	Action: More emphasis and commitment needed to Improvement Plan.

S.2.2. Define Level of Service and Performance

Levels of service have been reviewed since the 2009 AMP, taking account of Community Outcomes, Legislative Requirements, financial constraints and knowledge of asset performance. Community Outcomes, levels of service, Performance Measures and current performance are detailed in Appendix R of this AMP.

S.2.3. Forecast Future Demand

Population and demand forecasting has been updated since the 2009 AMP and is described in Appendix F.

Demand Management has been undertaken as described in Appendix N.

S.2.4. Understand the Asset Base

Council has a wealth of information on their assets which is collected, recorded and stored through a number of different systems. Data is graded for accuracy and completeness as shown in Table S-2.

Table S-2: Asset Data Accuracy and Completeness Grades

Grade	Description	Accuracy
1	Accurate	100%
2	Minor inaccuracies	± 5%
3	50% estimated	± 20%
4	Significant Data estimated	± 30%
5	All data estimated	± 40%

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

Table S-3 summarises the various data types, data source and how they are managed within Council. It also provides a grading on data accuracy and completeness where appropriate. Council is constantly improving the accuracy and completeness of their data.

Council's corporate Asset Management System (AMS) is Confirm Enterprise. The Engineering department uses Confirm to record and track customer enquiries, maintain its asset register and for tracking non-routine maintenance of assets. Valuations of assets is also run from Confirm.

The Asset Information team, Asset Managers, Council's consultants and contractors all have access to the system with levels of access appropriate to their needs.

Council's Confirm system is the primary asset management system and data management tool for the engineering activities. Confirm is a modular system and is a powerful tool used for the storage, interrogation and reporting of asset data.

Table S-3: Data Types and Source

Information System	Data Type	Management Strategy	Data Confidence	
			Accuracy	Completeness
Confirm	Asset Location (point data)	Point data is provided in Confirm. All spatial data will be migrating to GIS in 2011/12 so will no longer be held in Confirm.	2	2
	Asset Description	Councils Asset Register is held in Confirm. It contains information on asset extent, age, remaining life, condition etc. Asset Valuations are undertaken through Confirm.	2	2
	Customer Service	All customer enquiries and service requests are logged through the Confirm system.	2	2
	Maintenance Information	All newly collected maintenance information is recorded in Confirm. The contractor is now able to collect and record all maintenance information in the field through the use of mobile devices which link to Confirm. Historical information sits with CMS and also with the Contractors SETI system. Council intend to migrate this historical data into a SQL database accessible from Confirm.	3	3
Infoworks	Hydraulic Modelling	Hydraulic models have been developed for a number of schemes and catchments and are maintained and updated as required. A copy of the final model is held by Council in Infoworks.	2	2
NM2	Resource Consents	NM2 is owned and managed by Council's consultants, MWH New Zealand Ltd. It holds all resource consents for water, wastewater, stormwater, solid waste and roading. NM2 is used to manage the accurate programming of actions required by the consents.	2	2
NCS	Financial Information	Council Accounting and Financial systems are based on Napier Computer Systems (NCS) software and GAAP Guidelines. Long term financial decisions are based on the development of 20-year financial plans.	2	2
	Water Meter Readings	Meter readings for urban water connections are held within NCS for water billing purposes. Information includes meter location and meter reading notes.	2	2
SCADA	Telemetry	Database which is used to monitor the performance of key assets. The system acts as a data logger.	2	2
CMS	Operational Performance	A database containing data information about pump types and operational performance (totalised flow etc.) is maintained. It is intended that this will be transferred eventually into Confirm. CMS is being phased out and the process will be replaced by Confirm (anticipated for 2011/12).	2	2

Information System	Data Type	Management Strategy	Data Confidence	
			Accuracy	Completeness
WINZ	Water Quality	Holds records of water quality testing, treatment plant and pump station inspections as carried out in accordance DWSNZ. Monitors water quality compliance information and assists in identifying trends in data.		
GIS	Asset Location	GIS is compiled from as-built information and should be the first port of call for asset location. However, there is a short time delay with importing the data into GIS so it is sometimes necessary to refer to the as-builts.	2	2
SilentOne	As Builts	As-builts are the primary source of asset location data. As-built plans of all new assets are scanned and incorporated into SILENTONE. This allows digital retrieval of as-builts from the GIS system. Early as-builts are to a lesser quality, however in recent years as-builts quality has been significantly improved and are now prepared to specific standards and reviewed/audited on receipt.	2	2
CITRIX	Growth and Demand Supply Model (GDSM)	The GDSM underpins Council's long term planning. It is not an isolated tool that calculates a development forecast, it is a number of linked processes that involve assessment of base data, expert interpretation and assessment, calculation and forecasting.	2	2
Trifecta	Road Corridor forward programmes	Council uploads their forward programme for Council activities, along with other service providers such as Telecom in order to identify programme clashes and opportunities.	2	3
Tenderlink	Tenders	Council upload all Request for Tender documents onto the Tenderlink system which allows Contractors to download for tender. The system also holds key information for tenderers. Tenderlink is a national database.	1	1
Various	Other Data Types	A large amount of information is not yet stored centrally within Council and is held and updated by Council's consultants or contractors. Council are moving towards Confirm being the primary source for all asset information, so these data sources will eventually migrate to Confirm.	3	3
Various	Asset Photos	Council's intention is that a library of asset photos will be stored within Confirm. At present however, electronic asset photographs are held by MWH New Zealand Ltd (with the exception of Streetlight which are stored in SilentOne).	2	2

S.2.5. Assess Asset Condition

Council undertook a comprehensive condition assessment of its water assets in a valuation exercise in 1998. Subsequent valuations have used the pre-existing condition assessment, but reviewing and amending with the asset management knowledge and experience gained through operation of the assets. This draws from knowledge based on.

- Pipe break reports where pipe condition and nature of break is recorded by service in the field and logged into digital loggers that record the information against the asset and the customer service request. Ultimately this will be held in Confirm for analysis of condition.
- Pipe break history where all pipe breaks are located by GPS to allow mapping on an annual basis to establish trends.

An above ground asset condition assessment is performed by the maintenance contractor on a three yearly basis, this was last carried out in 2008.

S.2.6. Identify Asset and Business Risks

Council have adopted an Integrated Risk Management framework to manage risks, both at corporate and activity level. This is detailed further in Appendix Q.

S.3 Developing Asset Management Strategies

There are many different types of decision making techniques that have been applied by Council during the development of the management plans. These are better described in relevant appendices, but are summarised here.

Table S-4: Asset Management Strategies Summary

Strategy	Processes and Systems
Renewals Management (Appendix I)	• Renewals first identified from valuation data in Confirm – when remaining life expires. • Forecast renewals are then field justified by reviewing with operations staff and asset management staff to confirm renewal requirements from valuation information and add to where there is specific knowledge of additional renewal requirements. • Optimising review undertaken to identify opportunities for: o "bundling" with other projects – across assets and services – eg roading, wastewater, power, telecom o optimised replacement – ie. whether the replacement asset should be the same size, capacity or manufacture, or are there justifications to replace with something different o smoothing of expenditure. • On an annual basis renewal work is programmed for implementation and managed as a programme – either through the Operations and Maintenance contract, or through specific tendered construction projects.

Strategy	Processes and Systems
Asset Creation Management (Appendix F)	• Asset creation forecasts are developed every three years when updating this AMP. • The 10 year forecast from the last update of the AMP is taken as a starting point, and then the outcomes of growth and demand forecasts, level of service and performance review, the risk management and a workshop with asset managers are used to identify upgrade projects needed. • All capital projects identified are listed and a cost estimate developed. For consistency, a cost estimating spreadsheet has been developed and a series of base rates developed after consultation with suppliers and recent contract prices for the more common work elements. The cost estimating spreadsheets require: o assessment of construction and non-construction costs (ie. Engineering, consenting costs, land costs) o an assessment of contingency needed – on a consistent basis between estimates o an evaluation of the project drivers – increased level of service, growth or renewal o an evaluation of a programme of implementation – spanning years to ensure appropriate time allowed for developing the project o a statement of the scope of the upgrade and a statement of risks and assumptions made in preparing the estimate. • Once estimated the forecasts are combined in a capital expenditure forecast database that records the outcomes of the estimate in a manner that allows summation of the work value against various criteria – scheme, project driver (growth, increased LOS or renewal), year or project. It is also used as an input into Council's financial system. • The funding of the capital forecast is modelled in Council's financial system NCS, and the implications for the forecast review at Council officer level and Councillor level. Any changes made to the projection in terms of deferring, adding or deleting projects is recorded and the implications on risk, growth or level of service stated. • The records of the individual project estimate sheets and the overall capital forecast spreadsheet are filed and retained.
Operational and Maintenance (Appendix E)	• Includes Strategic Studies such as hydraulic modelling, demand management, leak detection.

S.4 Asset Management Enablers

The Asset Management Enablers are the aspects that underpin the whole asset management decision making at each stage of the Asset Management Process. These are summarised here, but detailed further throughout this AMP

Asset Management Teams – consists of Asset Managers and their consultants.

Asset Management Plans – this AMP is a key part of the asset management process and is updated on a regular basis.

Information Systems and Tools – these are detailed in Table S-3.

Asset Management Service Delivery – include the procurement strategies that ensure Council delivers the asset management activities in the most cost-effective way. This is primarily managed through a professional services contract with MWH New Zealand Ltd for consultation services, operation and maintenance contract C688 and through a special procurement and tender process for construction work.

Quality Management – there are a variety of rigorous quality assurance processes involved in management of the water activity.

Continuous Improvement – Covered by Appendix V. The Improvement Programme shown in this document is a snapshot of the programme in its current state. The Improvement Programme is reviewed and updated on a regular basis.

APPENDIX T. BYLAWS

The following bylaws have been adopted by Council:

- Consolidated Bylaws 2006 - Introduction
- Control of Liquor in Public Places 2007
- Dog Control Bylaw 2009
- Freedom Camping Bylaw 2011
- Navigation Safety Bylaw 2006
- Speed Limits Bylaw 2004
- Stock Control and Droving Bylaw 2005
- Trade Waste Bylaw 2005
- Trading in Public Places Bylaw 2010
- Traffic Control Bylaw 2005
- **Water Supply Bylaw 2009*.**

In accordance with the Local Government Act 2002, these bylaws will be reviewed no later than 10 years after they was last reviewed.

***Bylaws of direct relevance in to this activity.**

APPENDIX U. STAKEHOLDERS AND CONSULTATION

U.1 Stakeholders

There are many individuals and organisations that have an interest in the management and / or operation of Council's assets. Council underwent a process whereby they identified an extensive list of these stakeholders and what aspects they value in the activity. The outcomes of that process are summarised below in Table U-1.

A full list is detailed under separate cover in Levels of Service Gap Analysis MWH New Zealand Ltd, December 2010.

Table U-1: Stakeholders

Stakeholder Group	Core Values
Customers / users	Affordability Customer service Quality Reliability / responsiveness Compliance Accessibility
Regulatory	Environmental sustainability Compliance Risk mitigation
Service providers / suppliers	Customer service Reliability / responsiveness
Elected members	Customer service
Media	Customer Service
Approved authority (funding)	Affordability Customer service Compliance
Funder	Affordability
Others (industry bodies, lobby groups, government departments, other affected parties)	Customer service

U.2 Consultation

U.2.1. Purpose of Consultation and Types of Consultation

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

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

- feedback from surveys
- public meetings
- feedback from elected members, advisory groups and working parties
- analysis of customer service requests and complaints
- consultation via the Annual Plan and LTP process.

Council commissions customer surveys on a regular basis, usually every three years, from the National Research Bureau Ltd[9], but more recently on an annual basis. These Communitrak™ surveys assess the levels of satisfaction with key services, including water supply services, and the willingness across the community to pay to improve services.

Council at times will undertake focussed surveys to get information on specific subjects or projects.

U.2.2. Consultation Outcomes

The most recent NRB Communitrak™ survey was undertaken in May/June 2011. This asked whether residents were satisfied with the water system and included residents that had a Council service and some that were not on a Council service. The results from this survey are summarised in Figure U-1.

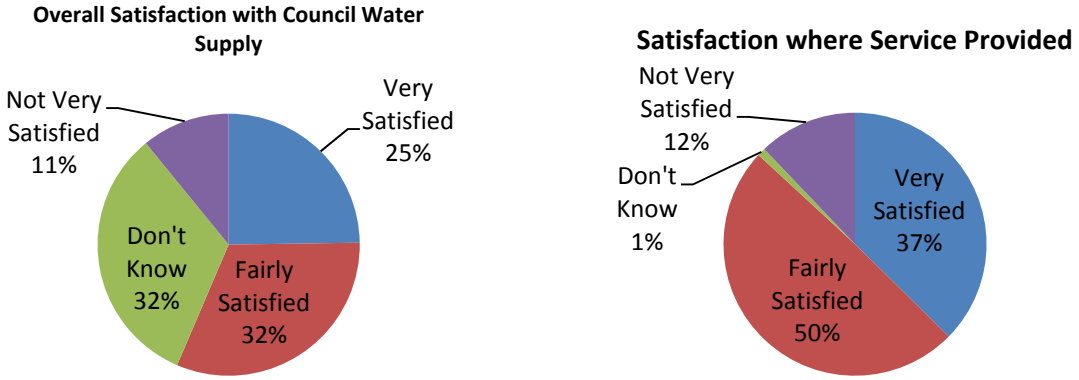


Figure U-1: Customer Satisfaction with Council Water Supply – Communitrak™ 2011

A large percent (32%) were unable to comment on their satisfaction with the Council's water supply. This is likely to due to the fact that 43% of residents interviewed said they were not provided with a Council water supply.

Figure U-2 shows an upward trend since 2008 in the numbers of people either 'very' or 'fairly' satisfied with the service.

However, this is slightly below Council's Peer Group average (61%) and below the National average. Where service is provided, the level of satisfaction is more comparable.

[9] Communitrak™: Public Perceptions and Interpretations of Council Services / Facilities and Representation, NRB Ltd May/June 2011.

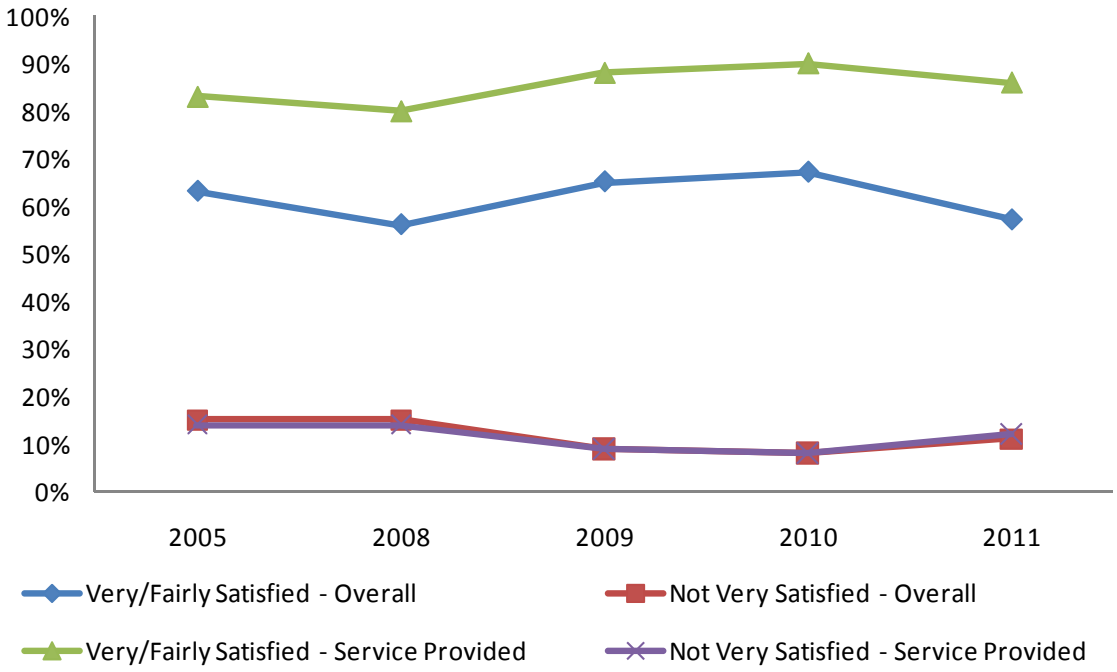


Figure U-2: Trend in Customer Satisfaction

The main reasons residents are not very satisfied with the water supply in Tasman district are:

- cost / too expensive / increased charges / paying for other areas
- not on town piped water supply
- inadequate supply / restrictions.

Figure U-3 shows the overall satisfaction with Council water supply by Ward.

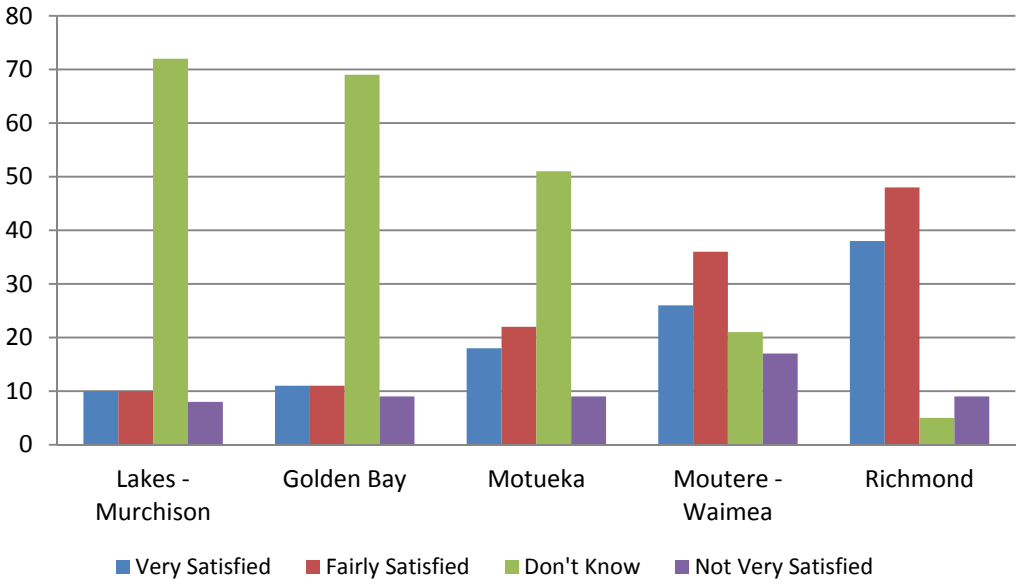


Figure U-3: Comparison of Customer Satisfaction by Ward

When asked whether they would like more to be spent, or less or about the same on water supply given that Council cannot spend more without increasing rates or user charges, 80% said they would like to see the same or more. This is shown in Figure U-4.

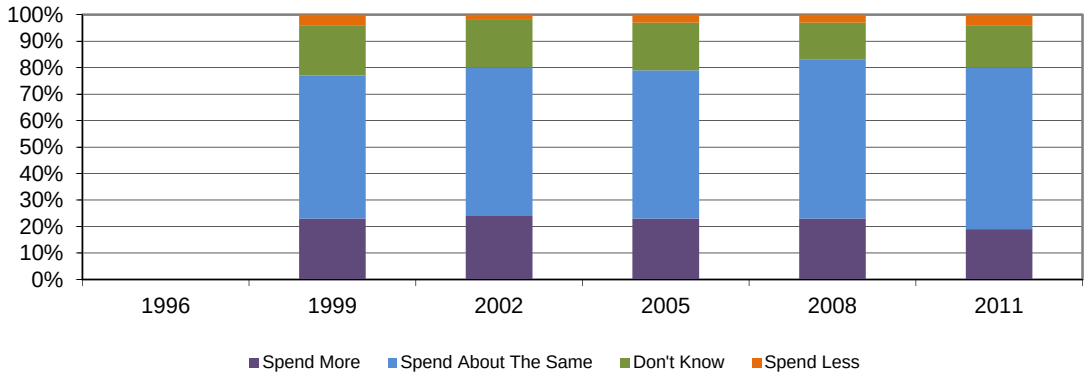


Figure U-4: More or Less Spending on Water Supply

This shows that few people want to spend less, and most want to spend the same or more.

The following is concluded from this survey.

- Residents that are connected to Council water supplies are satisfied with the service received and are comfortable with the cost relative to the level of service provided.
- Few people want to spend less on water supply.
- Just 20% want more spent knowing that this will mean higher charges.
- There is a lower level of satisfaction with water supply service when residents not on a Council scheme are considered. This possibly could mean there is unmet demand for a Council service, however the survey is not structured to answer this question, so such a conclusion is stretching the data too far.

APPENDIX V. IMPROVEMENT PROGRAMME

V.1 Process Overview

The Activity Management Plans have been developed as a tool to help Council manage their assets, deliver the levels of service and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure Council continues to achieve the appropriate (and desired) level of activity management practice; delivering services in the most sustainable way while meeting the community's needs.

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

The continuous improvement process includes:

- identification of improvements
- prioritisation of improvements
- establishment of an improvement programme
- delivery of improvements
- on-going review and monitoring of the programme.

All improvements identified are included in a single improvement programme encompassing all activities managed by Council's Engineering Services. In this way, opportunities to identify and deliver cross-activity improvements can be managed more efficiently, and overall delivery of improvement can be monitored across this part of Council's business.

V.2 Strategic Improvements

In April 2010 Council identified the key cross activity improvement actions within Engineering Services for implementation prior to development of the AMPs for the 2012 to 2022 long term plan period. These were:

- update the growth strategy for the changed economic climate
- review levels of service to ensure they adequately cover core customer values
- implement Council's integrated risk management approach to activity level

These actions were all completed and have fed into the development of the current Activity Management Plan.

V.3 Training

Council do not have a formal schedule of required training, however both Council's staff and its consultants participate in training on a regular basis to ensure that best practice is maintained. This also helps to maintain a good asset management culture.

Council and its consultants are structured in a way that encompasses succession planning to prevent the loss of knowledge in the event of staff turnover. This AMP document also prevents loss of knowledge by documenting practices and process associated with this activity.

V.4 Asset Management Practice Reviews

Since the last AMP review, Council has undertaken a performance review of all Engineering Services activity management practices to compare how they align with the requirements of the Local Government Act 2002, Office of Auditor General (OAG) and industry best practices. This review process has been applied to identify improvement actions, and to monitor achievement of improvements against industry practice areas and Council priorities.

The results of reviews in 2009 and 2011 are shown on Figure V-1 below for this activity. Overall the targeted level (hollow bars) of improvement has been achieved or exceeded (results are shown as solid colour bars).

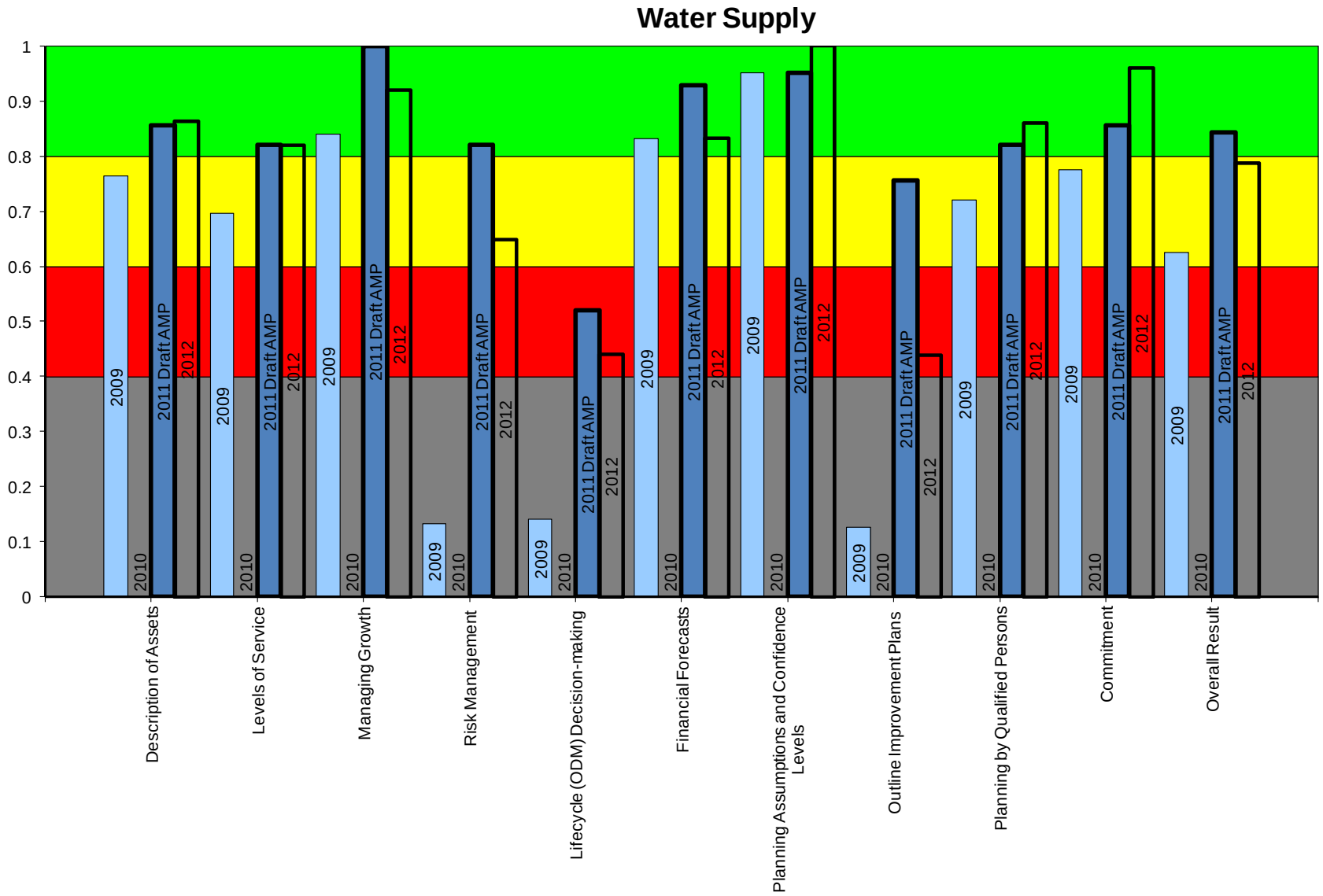


Figure V-1: Results of Benchmarking Review on Draft AMP

The methodology and the findings from the review are detailed in a separate report (*Performance Review of Water Supply Activity Management Practices*; MWH New Zealand Ltd, February 2010, and separate benchmarking review tables completed September 2011).

Council also sought consultation on selecting the appropriate level of activity management (*Selecting the Appropriate AM Level*; Waugh, August 2010).

Improvement actions identified in both of these reviews were included in the improvement programme.

Council will review the currency of the performance review checklist used to identify improvement actions as a result of the recent update to the International Infrastructure Management Manual (NAMS 2011), and will update this checklist as appropriate. This is an Engineering Services improvement item encompassing all activities and is therefore not identified on the improvements list for this activity.

V.5 Peer Review

This Activity Management Plan document was subject to a peer review in its Draft format by Waugh Infrastructure Management Ltd in October 2011. The document was reviewed for compliance with the requirements of the LGA 2002. The findings from the review indicated a need to present further discussion or evidence in the AMP to support the practices and processes in place in the operation, management and administration of the activity.

The findings and suggestions were assessed and prioritised by the asset management team. Those items that proved to be of sufficiently high value and efficiency to address were included in the Draft for Consultation (Version 4) of this document. The remainder were added to the Improvement Plan where necessary.

Version 4 of this document was then reviewed a final time by Waugh Infrastructure Management Ltd in May 2012. The report produced has been included at the end of this Appendix.

V.6 Improvement Programme Status

A summary on the status of all improvement items related to this activity are shown in the table below, and are split by the year that they were identified.

Table V-1: Status of Improvement Items

Practice Area (year improvement action identified)	Complete	In Progress	Not Relevant	Not Started	Grand Total
2009	**5**	**8**	**2**	**2**	**17**
1 - Description of Assets	1	2			3
2 - Levels of Service	1	1		1	3
3 - Managing Growth		1			1
4 - Risk Management	2	1			3
5 - Lifecycle (Optimised) Decision-making		2	2	1	5
6 - Financial Forecasts		1			1
7 - Planning Assumptions & Confidence Levels	1				1
2010	**14**	**5**		**1**	**20**
1 - Description of Assets	4				4
2 - Levels of Service	3				3
3 - Managing Growth	1				1
5 - Lifecycle (Optimised) Decision-making		4			4
7 - Planning Assumptions & Confidence Levels				1	1
8 - Outline Improvement Programmes		1			1
9 - Planning by Qualified Persons	2				2
10 - Commitment	4				4
2011		**2**		**30**	**32**

1 - Description of Assets				5	5
2 - Levels of Service				2	2
3 - Managing Growth				3	3
4 - Risk Management				4	4
Practice Area (year improvement action identified)	**Complete**	**In Progress**	**Not Relevant**	**Not Started**	**Grand Total**
5 - Lifecycle (Optimised) Decision-making				8	8
6 - Financial Forecasts				2	2
7 - Planning Assumptions & Confidence Levels		1		2	3
8 - Outline Improvement Programmes				2	2
9 - Planning by Qualified Persons				1	1
10 - Commitment		1		1	2
Grand Total	**19**	**15**	**2**	**33**	**69**

The Improvement Programme will be adopted in line with the adoption of the Long Term Plan and this Activity Management Plan. It will be continuously monitored with a full review on an annual basis and the status of the improvement items assessed and reported.

V.7 Improvement Actions Status

Improvement items completed for the period are shown in Table V-2 below:

Table V-2: Improvement Actions Completed

AMP Action Reference	Improvement action	Further Information	Status	Year that Improvement Action was Identified
A.002	**Links to Overarching Council Plans:-** Document linkages to the Regional Plan in the AMP.	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11
A.003	**Links to Activity Related Plans:** Improve documentation in the AMP of linkages to the Regional Policy Statements.	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11
A.004	**Links to Other Council Plans:-** There are clear linkages to the Wastewater AMP that need to be identified in the AMP (were identified internally but hasn't been documented).	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11
A.005	**-Links to Other Council Plans:-** Document linkages to procurement policies in the AMP.	Documenting - standard paragraph detailing AMP links to procurement policies.	Complete	30-Oct-11
F.001	**The Level and Impact of New Capital Works on the Network:** Improve documentation of selection criteria for new capital.	Documenting - standard paragraph detailing selection criteria for new capital.	Complete	30-Oct-11
H.001	**Resource Consent Database:** Expand the database to include all resource consents related to the water supply system.	Review current status and develop further.	Complete	
H.002	**Resource Consent Monitoring:** Develop and implement a programme of monitoring to ensure water takes comply with resource consent conditions.	Financial provision made in the O&M budget. Item 42 on the Strategic Studies list.	Complete	30-Jun-10
I.002	**Asset Renewals:** Improve documentation of the framework for renewals in the AMP.	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11

AMP Action Reference	Improvement action	Further Information	Status	Year that Improvement Action was Identified
I.003	**Asset Renewals:** Improve documentation of the extent of deferred renewals.	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11
I.004	**Asset Renewals:** Improve documentation of how renewals are delivered.	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11
N.002	**Commonality of Approach:** Review demand management approach between each activity related to water (e.g. wastewater, possibly also stormwater) for linkages. Check if AMP is consistent with District Plan (and correct AMP if not).	May require minor project work to enable documenting.	Complete	
Q.001	**Risk Management:** Council intends to apply a consistent approach to risk management across all asset groups. Three levels of risk assessment will carried out; Organisation, Asset Group and Critical Assets.	Financial provision made in the O&M budget. Item 39 on the Strategic Studies list.	Complete	30-Jun-10
Q.002	Introducing activity specific assumptions into the AMP.	Activity Level	Complete	1-Jul-10
R.001	**LOS Development:** Document how LOS have been developed internally within Council in the AMP (currently stated in LTP).	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11
R.002	**LOS Development:** Develop LOS for the next AMP in conjunction with the results of customer surveys and document this in the AMP to show how LOS have been developed with customers/users.		Complete	
R.003	**Gap Analysis: P**rovide more detail in Appendix R on the gaps where current LoS is less than the desired LoS and identify how these will be addressed (this should be mostly addressed through the WSAA).		Complete	
U.002	**Public Info Brochure (DWSNZ):** Producing a Brochure to the public regarding the changes to the Drinking Water Amendment, and the necessary upgrades required.	Being funded from the WSSA original budget at present.	Complete	
Z.001	**AMP Development:-** Document in the AMP all the departments who provided input to the AMP (e.g. Finance).	Documenting - Standard paragraph on AMP development and input	Complete	1-Jun-14
Z.002	**Guidance and Upskilling:** Improve documentation in the AMP on how review of previous audits is incorporated.- Document response to Audit NZ report in next version.	Due for Draft version complete by Oct 2011.	Complete	30-Oct-11

Table V-3 details the improvements to the activity management practices that need to be carried out in the future.

Table V-3: Current Improvement Actions

AMP Action Reference	Improvement Action	Further Information	Priority (High, Medium, Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Procurement/ Delivery Strategy	Council Person Responsible for Managing to Close	Cost Estimate for Years 1 - 3
A.001	**AMP Review:** Review and Update the AMP on a 3 year cycle. Next revision due in 2015.	Financial provision made in the O&M budget. Item 2 on the Strategic Studies list.	H	In progress	2011	30-Oct-14	Consultant	Jeff Cuthbertson	$ 100,000
B.002	**Hydraulic Model Calibration:** Recalibration and maintenance of the hydraulic models for Richmond/Waimea, Mapua, Wakefield, Motueka and Brightwater.	Financial provision made in the O&M budget. Items 9, 11, 12, 13, 14, 16 on the Strategic Studies list.	H	In Progress	2009	30-Jun-17	Consultant	Jeff Cuthbertson	$ 135,000
B.003	**Tapawera Asset Data Compilation:** No complete set of accurate plans for Tapawera water supply.		M	In progress	2009	1-Jun-12	Consultant	Jeff Cuthbertson	$ 20,000
B.004	**Rural Schemes Markation:** More accurate GIS information for location of valves, tank connections and junctions.	Financial provision made in the O&M budget. Item 48 on the Strategic Studies list.	L	In progress	2009	1-Jun-22	Consultant	Jeff Cuthbertson	$ 20,000
B.005	Strategic Studies: Develop a database for recording Strategic Studies done to date, and file path to where the stored	Will assist when reviewing future projects and additional work.	L	Not started	2011	1-Jul-16	Consultant	Jeff Cuthbertson	$ 50,000
C.001	**WSSA:** Identify areas where communities would benefit from a higher level of service. WSSA to be completed every 3 years. Next revision due 2015.	Financial provision made in the O&M budget. Item 1 on the Strategic Studies list.	M	In progress	2009	5-May-16	Consultant	Jeff Cuthbertson	$ 40,000
C.002	**PHRMPs:** An approved PHRMP to be in place for every Council Water Supply.	Financial provision made in the O&M budget. Items 26-37 on the Strategic Studies list.	H	In progress	2009	1-Jun-19	Consultant	Jeff Cuthbertson	$ 222,500
C.003	**Water System Operation Plans:** Developing System Operating Plans for all Water Supplies	Being funded from Strategic Study project 43 and 44	M	Not started	2011	1/06/2016	Consultant	Jeff Cuthbertson	$ 242,000
C.004	**Inspection of Significant**	Being funded from	M	Not	2011	1/06/2013	Consultant	Jeff Cuthbertson	$ 30,000

AMP Action Reference	Improvement Action	Further Information	Priority (High, Medium, Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Procurement/ Delivery Strategy	Council Person Responsible for Managing to Close	Cost Estimate for Years 1 - 3
	Assets: Inspecting all significant assets to conform the condition of key reservoirs.	Strategic Study project 45.		started					
C.005	**Inspection of all water retaining structures:** Inspecting all water retaining structures throughout the district.	Being funded from Strategic Study project 46.	M	Not started	2011	1/06/2014	Consultant	Jeff Cuthbertson	$ 50,000
C.006	**Fire Hydrant Audits:** Undertaking flow assessments within the Urban Water Supply areas to check against whether the network is conforming to the fire fighting standards, since the code was updated.	Being funded from Strategic Study project 52.	M	Not started	2011	1/06/2016	Consultant	Jeff Cuthbertson	$ 15,000
D.001	**Asset Valuations:** Review and update the water Asset Valuation on a 3 yearly cycle. Next review due in 2012.	Financial provision made in the O&M budget. Item 6 on the Strategic Studies list.	H	In progress	2009	30-Jun-13	Consultant	Jeff Cuthbertson	$ 20,000
E.001	**Lifecycle Decision Making:** Detail how options have been identified for asset maintenance to achieve optimal costs over life.		M	Not Started	2011	2014	Consultant	Jeff Cuthbertson	$ -
G.001	**Financial Assessment:** Collate historic and new information on Development Contributions to allow analysis of DCs paid vs forecasts and trending.		H	Not Started	2011	2014	In-House	Peter Thomson	$ -
I.001	**Robust Renewals Programme:** Develop a renewals programme for pipelines and valves. Based on targeted areas with a risk based decision support tool.	Council has purchased Infonet.	M	In progress	2009	1-Jun-14	Consultant	Jeff Cuthbertson	$ 10,000
K.001	**Financial Assessment:** Explore if Councils policy around debt funding is specific enough..		M	Not Started	2011	2014	In-House	Peter Thomson	$ -
N.001	**Water Demand Management:** Undertake the demand management items as detailed in Appendix N.	Financial provision made in the O&M budget. Items 18, 22, 24, 56, 57, 58, 63 on the Strategic	H	In progress	2009	1/06/2020	Consultant	Jeff Cuthbertson	$ 190,000

AMP Action Reference	Improvement Action	Further Information	Priority (High, Medium, Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Procurement/ Delivery Strategy	Council Person Responsible for Managing to Close	Cost Estimate for Years 1 - 3
		Studies list.							
N.003	**Demand Management:** Collate historical information on demand to enable demand trending and analysis.		M	Not Started	2011	2014	Consultant	Jeff Cuthbertson	$ -
N.004	**Demand Management:** Provide greater detail on the effects of changing demographics rather than population growth.		L	Not Started	2011	2014	Consultant	Jeff Cuthbertson	$ -
N.005	**Demand Management:** Undertake sensitivity analysis on growth and demand and the effect on activity requirements.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
P.001	**Sustainability:** Explore the need to develop a Council-wide sustainability Policy.		M	Not Started	2011	2014	In-House	Peter Thomson	$ -
P.002	**Sustainability:** Expand detail on sustainability for the activity. Develop KPIs for environmental, economic and social aspects of sustainable development.		M	Not Started	2011	2014	In-house with consultant support	Peter Thomson	$ -
Q.003	**Risk Management:** Implement IRM across Council. Currently being used within individual activities.		M	Not Started	2011	2014	In-House	Peter Thomson	$ -
Q.004	**Risk Management:** Detail and demonstrate how asset criticality and risk analysis is used to develop maintenance strategies.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
Q.005	**Risk Management:** Detail and demonstrate how asset criticality and risk analysis is used to develop renewals strategies.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
Q.006	**Lifecycle Decision Making:** Further develop and detail process for decision making with regards to O&M, renewals, capex and disposals.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
Q.007	**Assumptions & Uncertainties:** Identify the uncertainty level of the more significant assumptions and detail the possible effects.		L	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -

AMP Action Reference	Improvement Action	Further Information	Priority (High, Medium, Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Procurement/ Delivery Strategy	Council Person Responsible for Managing to Close	Cost Estimate for Years 1 - 3
Q.008	**Asset Data:** Identify and document process for updating/reporting on confidence levels of asset condition and performance.		M	Not Started	2011	2014		Jeff Cuthbertson	$ -
Q.009	**Assumptions & Uncertainties:** Identify and state the confidence levels for the growth/demand forecasts.		M	In Progress	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
Q.010	**Cost/Benefit Analysis:** Detail and demonstrate the level of cost/benefit analysis undertaken for projects within the activity.		M	Not Started	2011	2014	Consultant	Jeff Cuthbertson	$ -
R.004	**Levels of Service:** Develop and incorporate sustainability strategies and operations into Levels of Service and performance measures.		M	Not Started	2011	2014	In-house with consultant support	Peter Thomson	$ -
S.001	**Asset Management System Development:** Develop Council's Asset Management System and integration with its related asset information systems, GIS, SilentOne etc.	Allowance needed in next AMP	H	Not started	2009	1-Jun-14	In-house with consultant support	Jeff Cuthbertson	$ 10,000
S.003	**Asset Systems:** Ensure that other asset registers are consistent with TDC's Confirm database.	Develop one asset register that is consistently used. Currently have various versions	H	Not started	2010	1-Jun-14	In-house	Jeff Cuthbertson	$ -
S.004	**Decision Making & Prioritisation:** Use results of hydraulic models to assess criticality of remaining water assets to improve prioritisation for renewals and document this in AMP.	Link to hydraulic modelling projects	H	In progress	2010	1-Jun-14	Consultant	Jeff Cuthbertson	$ 10,000
S.005	**ODM Approach:** Formalise and document the processes for decision making in the AMP.		M	In progress	2010	1-Jun-14	Consultant	Jeff Cuthbertson	$ 2,000

AMP Action Reference	Improvement Action	Further Information	Priority (High, Medium, Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Procurement/ Delivery Strategy	Council Person Responsible for Managing to Close	Cost Estimate for Years 1 - 3
S.006	**ODM Tools and Techniques:** Improve and document the processes for selection of pipe material in the AMP.		L	In progress	2010	1-Jun-14	Consultant	Jeff Cuthbertson	$ 2,000
S.007	**ODM Integration:** Document the links between ODM decision making in cross-infrastructure work planning in the AMP.			In Progress	2010		Consultant	Jeff Cuthbertson	$ -
S.008	**Description of Assets:** Consider adding asset hierarchy into the Confirm system. The capabilities are there, but not yet used by Council.		L	Not Started	2011	2014	In-House	Peter Thomson	$ -
S.009	**Description of Assets:** Improve information on the level of recording, monitoring and reporting of asset information.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
S.010	**Critical Assets:** Create ability to separately identify Critical Assets in Confirm. Be able to report on this information easily.		H	Not Started	2011	2014	In-house	Jeff Cuthbertson	$ -
S.011	**Asset Information:** Collate and provide information on how asset condition is monitored.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
S.012	**Asset Condition Data:** Detail how asset condition is monitored and reported for key asset types.		H	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
S.013	**Asset Performance Data:** Detail how asset performance is monitored and reported for key asset types.		H	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
S.014	**Lifecycle Decision Making:** detail and demonstrate how trade-offs are made between renewals and maintenance expenditure.		L	Not Started	2011	2014	Consultant	Jeff Cuthbertson	$ -
U.001	**Public Information Brochure:** Prepare a brochure setting out the Council's and landowners responsibility for water management and maintenance. This will also be put on the TDC website.	Allowance needed in next AMP	M	Not Started	2009	1-Jun-14	In-house with consultant support	Jeff Cuthbertson	$10,000

AMP Action Reference	Improvement Action	Further Information	Priority (High, Medium, Low)	Status	Year that Improvement Action was Identified	Forecast Completion Date	Procurement/ Delivery Strategy	Council Person Responsible for Managing to Close	Cost Estimate for Years 1 - 3
V.001	**Gap Analysis and Improvement Programme:** Improve this improvement programme particularly: timelines, required resources and approval of resources.		M	In progress	2010	1-Jun-14	In-house	Jeff Cuthbertson	$ 5,000
V.002	**Improvement Plans:** formalise timeframes and budgets for improvement actions.		H	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -
V.003	**Improvement Plans:** develop and implement process for monitoring and reporting against the Improvement Plan.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	$ -

V.8 AMP Peer Review

Infrastructure Management

Tasman District Council

Water, Wastewater, Stormwater, Solid Waste, Aerodromes, Transport, Rivers and Coastal Structures AMPs Peer Review

October 2011 & May 2012

WAUGH

ideas | analysis | solutions

WAUGH

Quality Record Sheet

Tasman District Council

Water, Wastewater, Stormwater,

Solid Waste, Transport, Aerodromes, Rivers

and Coastal Structures

AMP Peer Review

October 2011 and May 2012

Issue Information	
Issue Purpose	Final
Issue Date	8th May 2012
Version Number	1.1

Authorisation	
Tasman District Council	Peter Thomson
Prepared by	Andrew Iremonger
Internal Reviewed by	Ross Waugh
Date	8th May 2012
Report Number	64-065-1002

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The purpose of this report is to:

- Provide a regulatory review of the October 2011 Tasman District Council (TDC) Water, Wastewater, Stormwater, Solid Waste, Aerodromes, Transport, Rivers and Coastal Structures Asset Management Plans for compliance with the primary legislation driving local government, this being the Local Government Act 2002
- Considers associated legislation and standards such as Financial Reporting Standards, Resource Management Act and Health Act as well as industry appropriate practice

1.2 Methodology

Waugh Infrastructure Management Ltd assessed in October 2011 the eight individual draft AMP's content in comparison to; the 12 assessment criteria and a number of elements for each assessment criteria, and to an assessed appropriate asset management level for Tasman District Council. These elements generally follow the Appropriate AM (from IIMM 2006: Section 2.2.4). The assessment criteria are:

- Description of Assets
- Levels of Service
- Managing Growth
- Risk Management
- Lifecycle Decision Making
- Financial Forecasts
- Planning Assumptions and Confidence Levels
- Outline Improvement Programmes
- Councils Commitment
- Planning by Qualified Persons
- Sustainability within the activity by using the Councils sustainability objectives
- The AMP Format (presented in a way that can be readily utilised by the required audience)

Following this review TDC made amendments to the AMP's that encompassed the inclusion of financial details, significant additions to the improvement program along with other items.

In May 2012 the amendments to the October AMPs were assessed by Waugh Infrastructure and the compliance status was reassessed. It should be noted that the May 2012 assessment only considered the items shown in the "Peer review improvement table" provided by MWH in their letter dated 3rd April 2012.

1.3 Overall Conclusion of Asset Management Plans Assessment

The AMP's indicate that TDC has developed good practices and processes in the operation, management and administration of their activities but the discussion or evidence presented within the individual AMP's is often insufficient to substantiate this.

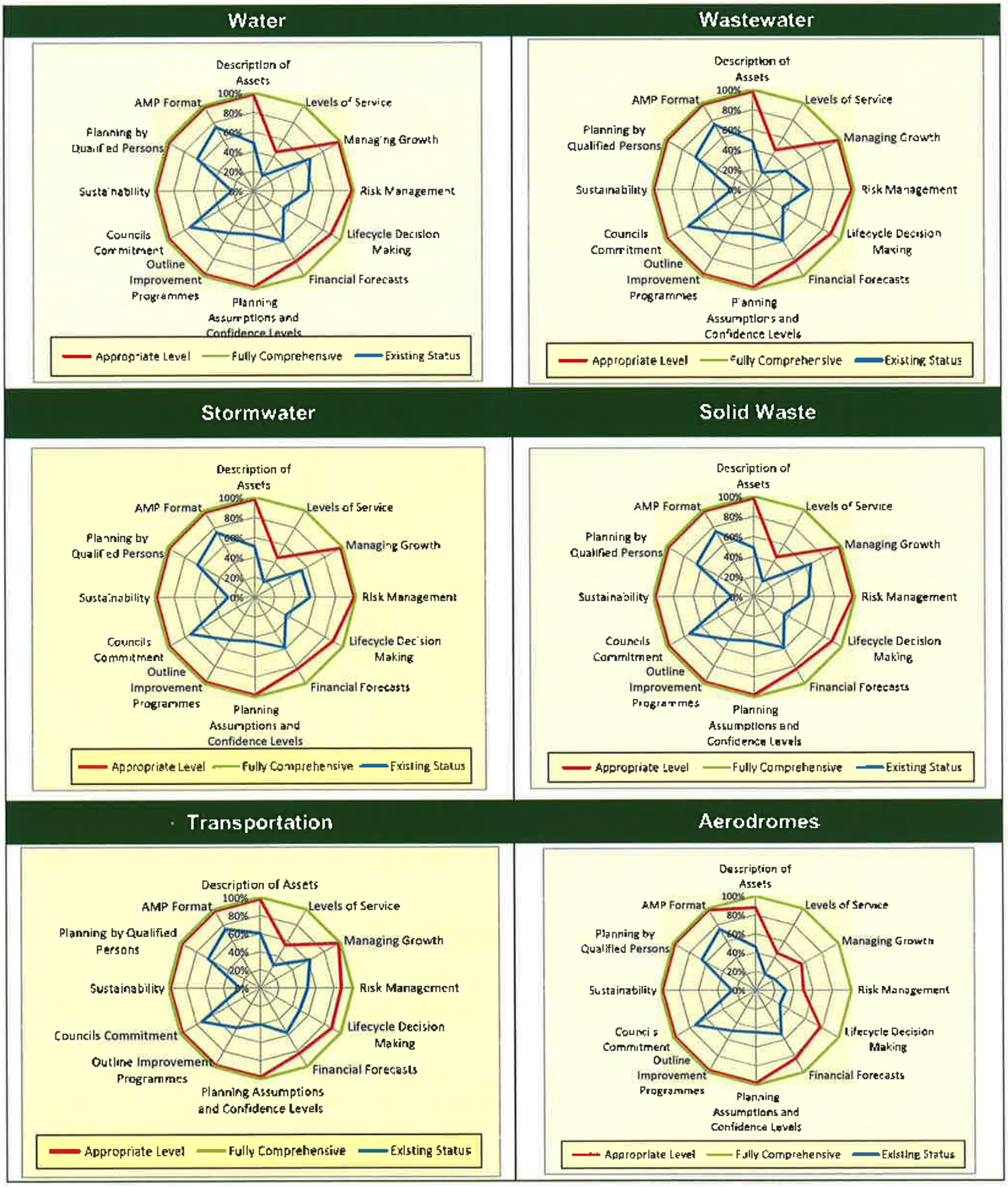
The AMP's provided in May 2012 indicates that many of the issues raised in the October review have been addressed in the subsequent version of the AMPs as amendments or improvement plan items. Competition of these actions would assist to achieve the Councils targeted asset management level.

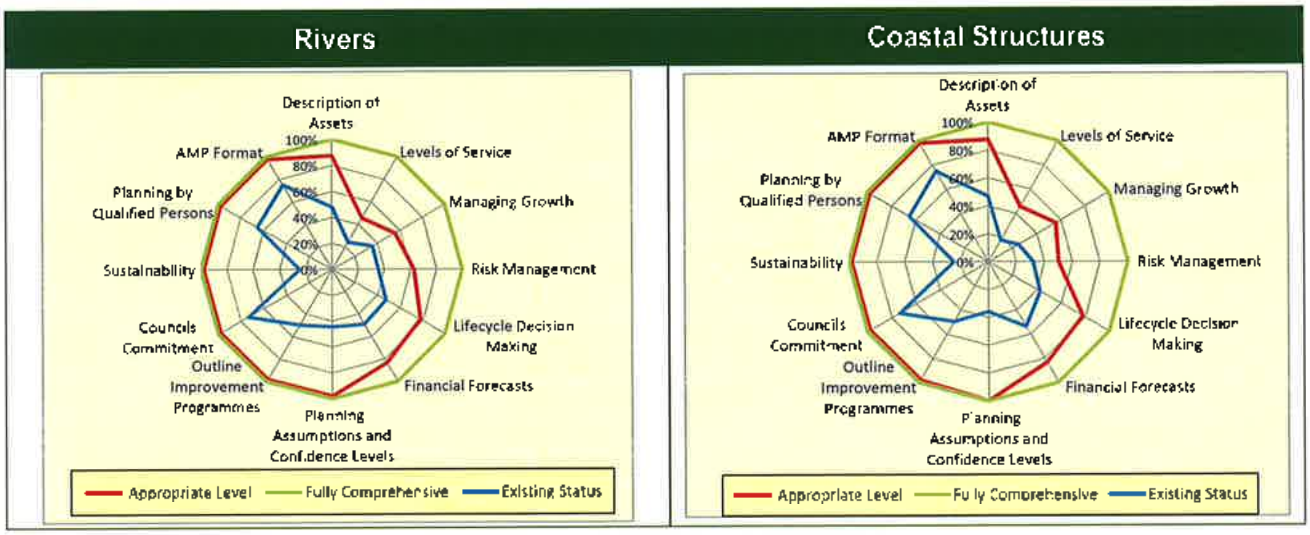
The AMPs assessed in May 2012 do provide Council with an adequate basis on which to make decisions between competing priorities for infrastructure funding and to understand the impact on

service levels in the longer term. On-going commitment is required to complete the actions identified to progress to the high levels of Asset Management practice.

An overview of the AMP Compliance status of the eight AMP's (dated February 2012) is provided in a graphical manner below.

Figure 1-1: AMP Compliance Status Graphs





1.4 Peer Review Limitations and Disclaimer

This Peer Review has been undertaken by Waugh Infrastructure Management Limited, based solely on the information presented in the Tasman District Council Water, Wastewater and Stormwater, Solid Wastes, Transportation, Aerodromes, Rivers and Coastal Structures Asset Management Plans. This report has been prepared solely for the benefit of the Tasman District Council. Waugh Infrastructure Management Limited does not warranty statements made in the eight Asset Management Plans subject to this peer review

This Peer Review represents the experienced opinion of the Reviewers, based on the available information and standards of practice extracted from the information.

This Peer Review makes no representation to reflect the views or standards of Audit NZ, nor does it warrant or certify (in any way) any compliance with possible Audit NZ and/or Office of the Auditor General requirements for Asset Plans.

2.0 RECORD OF PEER REVIEW ENGAGEMENT

Council Name	Tasman District Council
AMP Titles	Water, Wastewater, Stormwater, Solid Wastes, Transportation, Aerodromes, Rivers and Coastal Structures Asset Management Plans
Plan Sponsor	Peter Thomson, Engineering Manager
AMP Prepared By (Plan Writer)	Council Staff - Water: David Light - Wastewater: David Light - Stormwater: Katie Henderson - Solid Waste: Katie Henderson - Transportation: Jenna Viogt - Aerodromes: Jenna Viogt - Rivers: Jenna Viogt - Coastal Structures: Jenna Viogt
AMP Publish Date	October 2011 and February 2012
Peer Reviewer (Waugh Infrastructure Management Ltd)	Ross Waugh Andrew Iremonger Grant Holland
Internal Review (Waugh Infrastructure Management Ltd)	Ross Waugh
Peer Review Dates	26 October 2011 and 4th May 2012 (review of additions from October 2011 to February 2012)

3.0 SCOPE AND USE OF PEER REVIEW

The Scope of the Peer Review is to provide a regulatory review of the Tasman District Council (TDC) Water, Wastewater, Stormwater, Solid Wastes, Transportation, Aerodromes, Rivers and Coastal Structures Asset Plans (dated October 2011 and February 2012) for compliance with the primary legislation driving local government, this being the Local Government Act 2002.

The Peer Review also considers associated legislation and standards such as Financial Reporting Standards, Resource Management Act and Health Act as well as industry appropriate practice as set by the International Infrastructure Management Manual.

The Peer Review is to comment on the Plan in relation to the following aspects in keeping with the following guidelines of the Office of the Auditor General:

- Transparency
- Inclusivity
- Sustainable Development Approach
- Completeness
- Neutrality
- Comparability
- Accuracy

The intended use of this Peer Review is for the Tasman District Council.

4.0 ASSESSMENT METHODOLOGY

Waugh Infrastructure Management Ltd assessed in October 2011 the eight individual draft AMP's content in comparison to; the 12 assessment criteria and a number of elements for each assessment criteria, and to an assessed appropriate asset management level for Tasman District Council. These elements generally follow the Appropriate AM (from IIMM 2006: Section 2.2.4). The assessment criteria are:

- Description of Assets
- Levels of Service
- Managing Growth
- Risk Management
- Lifecycle Decision Making
- Financial Forecasts
- Planning Assumptions and Confidence Levels
- Outline Improvement Programmes
- Councils Commitment
- Planning by Qualified Persons
- Sustainability within the activity by using the Councils sustainability objectives
- The AMP Format (presented in a way that can be readily utilised by the required audience)

Following this review TDC made amendments to the AMP's that encompassed the inclusion of financial details, significant additions to the improvement program along with other items.

In May 2012 the amendments to the October AMPs were assessed by Waugh Infrastructure and the compliance status was reassessed. It should be noted that the May 2012 assessment only considered the items shown in the "Peer review improvement table" provided by MWH in their letter dated 3rd April 2012.

4.1 Scoring Methodology

The marking of each question area ranges from nil (no reference shown) to 5 (fully compliant) as shown in Table 4-1 below. Following the Fulfilment marking the comments field will indicate any issue considered relevant.

Table 4-1: Scoring Methodology

Fulfilment Requirements	AMP Details
Nil (0)	Not shown or no reference to
Minimal and fragmented (1)	20% compliant - Disjointed
Basic alignment (2)	30% compliant -
Partially (3)	50% compliant -
High level of alignment (4)	80% compliant - minor defects or admissions
Fully Compliant (5)	All areas within this section are fully compliant

The sum of each Assessment area score was then compared to the maximum score required using the Appropriate Practice for the component area i.e. description of assets, LoS etc. This data is shown in the overall AMP Compliance Status excel tables and the AMP Compliance Status graphs.

It should be noted that where there is no information or reference for any question area the score assigned is zero; this will result in a low overall score.

4.2 Appropriate Practice for Tasman District Council Asset Management

Objective of the Asset Management Policy

The objective of the Tasman District Council's Asset Management Policy for the eight utility Activities is to ensure that Council's service delivery is optimised to deliver agreed community outcomes and levels of service, manage related risks, and optimise expenditure over the entire life cycle of the service delivery, using appropriate assets as required.

The Asset Management Policy requires that the management of assets be in a systematic process to guide planning, acquisition, operation and maintenance, renewal and disposal of the required assets.

Delivery of service is required to be sustainable in the long term and deliver on Council's economic, environmental, social, and cultural objectives.

The Councils Asset Management Policy sets the appropriate level of asset management practice for Council's Activity as:

- Transportation: Core Plus with demand management and resource availability drivers
- 3 Waters: Core Plus with demand and risk management drivers
- Solid Waste: Core with risk management drivers
- Coastal structures: Core
- Rivers: Core
- Aerodromes: Core

The appropriate practice status analysis for all eight services is shown in the following table as highlighted green.

Table 4-2: Utilities Asset Management Appropriate Practice Assessment

Assessment Criteria (as outlined in IIMM 2006)		Appropriate Practice Status Analysis							
		Water	Wastewater	Stormwater	Solid Waste	Transportation	Aerodromes	Rivers	Coastal Structures
Description of Assets									
Core	Adequate Description of Asset								
	Financial Description of Asset								
	Remaining useful life								
	Aggregate & Disaggregate Information								
Advanced	Reliable Physical inventory								
	- Physical attributes (location, material, age etc.)								
	- Systematic monitoring of condition								
	- Systematic measurement performance- Utilisation/capacity								
Levels of Service									
Core	Define LOS or performance								
	Linkage to strategic/community outcomes								
	Links to other planning documents								
	Levels of consultation identified and agreement								
	Service life of network stated								
Advanced	For Significant Services								
	- Evaluating LOS Options								
	- Consult LOS options with community								
	- Adoption LOS & Standards after consultation								
	- Public communication of service level								
	- Monitoring & public reporting								
	AMP's reflect agreed LOS & how service is delivered								
Managing Growth									
Core	Demand Forecasts (10 year)								
	Demand Management drivers								
	Demand Management strategies								
	Sustainability Strategies								
Advanced	Forecasts include factors that comprise demand								
	Sensitivity of asset development (Capital Works) to demand changes								

Assessment Criteria (as outlined in IIMM 2006)		Appropriate Practice Status Analysis							
		Water	Wastewater	Stormwater	Solid Waste	Transportation	Aerodromes	Rivers	Coastal Structures
	Asset Utilisation/ Demand Modelling								
Risk Management									
Core	Identify critical assets								
	Identify significant negative effects								
	Identify associated risks and RM strategies								
Advanced	Recognition & application of principles of integrated risk management to assets								
	Apply standards & industry good practice (e.g. NZS4360 and Local Government Handbook)								
	RM integrated with Lifelines, disasters recovery, Continuity plans,.								
	Integrate with maintenance and replacement strategies								
Lifecycle Decision Making									
Core	Lifecycle and Asset Management Practices								
	Service capacity gap analysis								
	Evaluation and ranking based on criteria of options for significant capital invest decisions for								
	Maintenance Outcomes, Strategies, Standards and Plan								
Advanced	Identify options for asset maintenance to achieve optimal costs over life of asset								
	· Apply agreed evaluation tools to prioritise work programmes								
	- Predictive modelling to support long-term financial forecasts for maintenance, renewals & new capital								
Financial Forecasts									
Core	10 year Financial plan Maintenance, Renewals, New Capital (LOS and demand).								
	Validate the Depreciation/Decline in Service Potential								
Advanced	Translate operational, planned maintenance, renewal & new work into financial terms over period of strategic plan								
	Provide consistent financial forecasts & Substantiate								
	Sensitivity of forecasts								
Planning Assumptions and Confidence Levels									
Core	List all assumptions and possible effects								
	Confidence level on asset condition, performance								
	Accuracy of asset inventory								

Assessment Criteria (as outlined in IIMM 2006)		Appropriate Practice Status Analysis							
		Water	Wastewater	Stormwater	Solid Waste	Transportation	Aerodromes	Rivers	Coastal Structures
	Confidence level demand/growth forecasts								
	Confidence level on financial forecasts								
Advanced	List all assumptions including organisations strategic plan that support AM – linkages with other planning doc								
	Confidence levels (IIMM 4.3.7)								
	- Inventory Data Critical Assets (Grade 1)Non Critical Assets (Grade 2)								
	- Condition Data Critical Assets (Grades 1 or 2)Non Critical Assets (Grades 1, 2 or 3)								
	- Performance Data Critical Assets (Grades 1 or 2) Non Critical Assets (Grades 1, 2 or 3)								
Outline Improvement Programmes									
Core	Identify improvements to AM processes & techniques								
	Identify weak areas & how they will be addressed								
	Timeframes for improvements								
	Identify resources required (human & financial)								
Advanced	Improvement programmes are monitored against KPI's								
	Previous improvements identified and formally reported against KPI's								
Planning by qualified persons									
	AM Planning should be undertaken by a suitably qualified person								
Core & Advanced	Process should be Peer reviewed								
Commitment									
Core	Plan adopted by Council including improvement programme								
	Plan key tool to support LTCCP								
	AM Plan regularly updated and should reflect progress on improvement plan								
Advanced	AM Plan requirements are being implemented and discrepancies formally reported								
	AM Plans evolving as AM systems provide better information								
	AM Plans updated every 3 years along with organisations strategic planning cycles								
	Council has defined the Appropriate AM Practice it is adopting								

5.0 OUTCOMES AND RESULTS OF REVIEW

5.1 Compliance Status Key Findings

The AMP Compliance Status is summarised in Table 5-1 below with an overview of the AMP Compliance status provided in a graphical manner in Figure 5-1. The individual AMP assessments are shown in an excel spreadsheet to allow an alternative viewing method.

The AMP's indicate that TDC has developed good practices and processes in the operation, management and administration of their activities but the discussion or evidence presented within the individual AMP's is often insufficient to substantiate this.

The AMP's provided in May 2012 indicates that many of the issues raised in the October review have been addressed in the subsequent version of the AMPs as amendments or improvement plan items. Competition of these actions would assist to achieve their targeted asset management level.

The AMPs assessed in May 2012 do provide Council with an adequate basis on which to make decisions between competing priorities for infrastructure funding and to understand the impact on service levels in the longer term. On-going commitment is required to complete the actions identified to progress to the high levels of Asset Management practice.

The areas that we consider will have most impact on the AMPs are those that have lower scores over all AMPs. These are:

- Description of assets – More information on the range of assets within each activity's asset register, the asset groups and the practices and processes that are associated with these along with a greater understanding of the condition and performance of the critical assets
- Levels of Service:
    - Levels of Service changes from 2009 (AMP and LTP) should be shown along with reasons and effects of these changes
    - While the Levels of Service listed in the AMP's may be appropriate for Council, there is little demonstration of how they were developed and the linkage with the community's priorities. Trends for performance to date should be shown along with a discussion on any Levels of Service gaps and link the initiatives proposed to close those gaps
- Lifecycle – Need to demonstrate the practices and processes carried out by TDC and those shown in the AMP are used on an on-going basis for the successful operation and renewal of the assets
- Growth – Additional information on utilisation especially at a higher level to enable a district wide assessment and the effects of the change in growth rates on infrastructure requirements
- Sustainability: All AMP's scored very low in this area
- Improvement Plan:
    - Improvement Program that details the requirements to achieve the appropriate AM level over the long term

5.2 General Comments

Water, Wastewater and Stormwater

These three services with appropriate AM practice set as Core Plus with demand and risk management drivers. AMP strengths in risk management in the 3Waters and growth for water services.

Solid Waste

An important Council asset and activity with appropriate AM practice set as Core. AMP provides good analysis of future growth and regional integration. AMP weakness in asset description, levels of

service, and asset lifecycle decision making are reflective of the entire AMP suite and the template approach.

Transportation

Given the extended of the asset involved in the AMP provided, very limited details are provided to support the narrative of the plan. The maintenance and renewal programmes represent a considerable investment for Council and these are examined or explained in the AMP. There may be issues or challenges such as changes in demand in the rural area, impacts of severe weather, metal availability which are not discussed.

Aerodromes

Asset and activity with appropriate AM practice set as Core. AMP weakness in asset description, levels of service, and asset lifecycle decision making are reflective of the entire AMP suite and the template approach

Rivers

Asset and activity with appropriate AM practice set as Core. AMP weakness in asset description, levels of service, and asset lifecycle decision making are reflective of the entire AMP suite and the template approach.

Coastal Structures

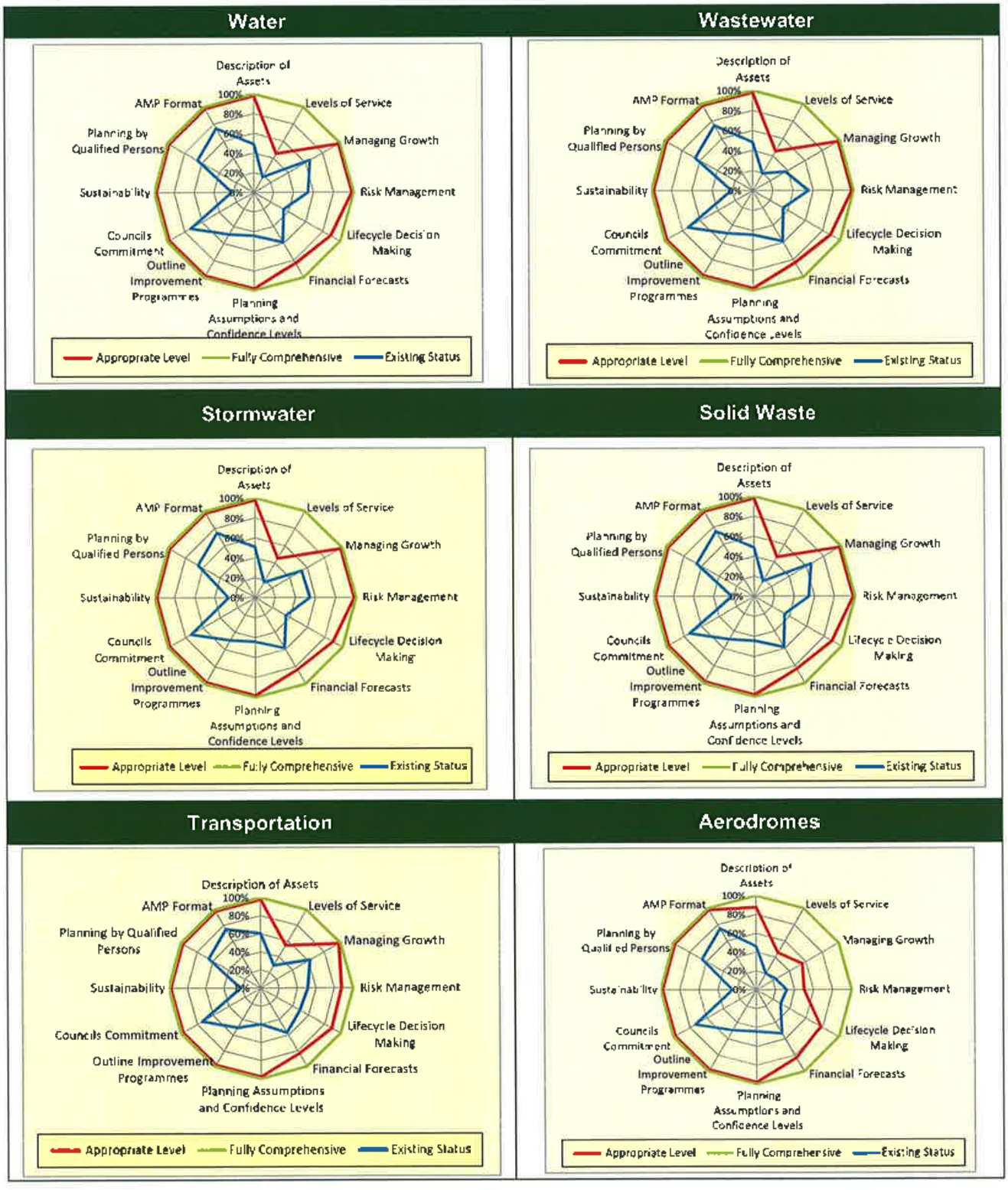
Asset and activity with appropriate AM practice set as Core. An important Council activity with relatively minor expenditure. AMP weakness in asset description, levels of service, managing growth and asset lifecycle decision making are reflective of the entire AMP suite and the template approach.

Table 5-1: AMP Compliance Status

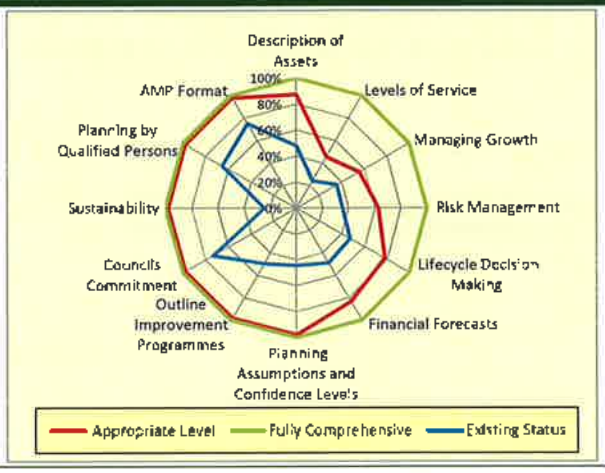
Service		Description of Assets	Levels of Service	Managing Growth	Risk Management	Lifecycle Decision making	Financial Forecasts	Planning Assumptions & Confidence Levels	Outline Improvement Programmes	Councils Commitment	Sustainability	Planning by Qualified Persons	AMP Format
Water	Existing Status	49%	18%	65%	54%	35%	58%	44%	49%	74%	22%	65%	75%
	Appropriate AM Level	100%	45%	100%	100%	89%	83%	100%	100%	100%	100%	100%	100%
Wastewater	Existing Status	48%	20%	38%	55%	35%	58%	44%	49%	74%	21%	65%	75%
	Appropriate AM Level	100%	45%	100%	100%	89%	83%	100%	100%	100%	100%	100%	100%
Stormwater	Existing Status	51%	18%	54%	54%	35%	58%	44%	49%	74%	26%	65%	75%
	Appropriate AM Level	100%	45%	100%	100%	89%	83%	100%	100%	100%	100%	100%	100%
Solid Waste	Existing Status	51%	20%	53%	55%	20%	53%	51%	49%	74%	57%	65%	75%
	Appropriate AM Level	100%	45%	67%	75%	44%	83%	100%	100%	100%	100%	100%	100%
Transportation	Existing Status	60%	29%	62%	51%	49%	57%	40%	50%	74%	23%	65%	75%
	Appropriate AM Level	100%	55%	100%	88%	89%	83%	100%	100%	100%	100%	100%	100%
Aerodromes	Existing Status	46%	20%	24%	32%	29%	53%	44%	49%	74%	25%	65%	75%
	Appropriate AM Level	88%	45%	56%	50%	78%	83%	100%	100%	100%	100%	100%	100%
Rivers	Existing Status	48%	24%	36%	36%	48%	49%	44%	49%	74%	25%	65%	75%
	Appropriate AM Level	88%	45%	56%	63%	78%	83%	100%	100%	100%	100%	100%	100%
Coastal Structures	Existing Status	47%	18%	25%	32%	43%	53%	36%	49%	74%	25%	65%	75%
	Appropriate AM Level	88%	45%	56%	50%	78%	83%	100%	100%	100%	100%	100%	100%

Note: The Existing Status and Estimated Appropriate AM level are expressed as a % of compliance

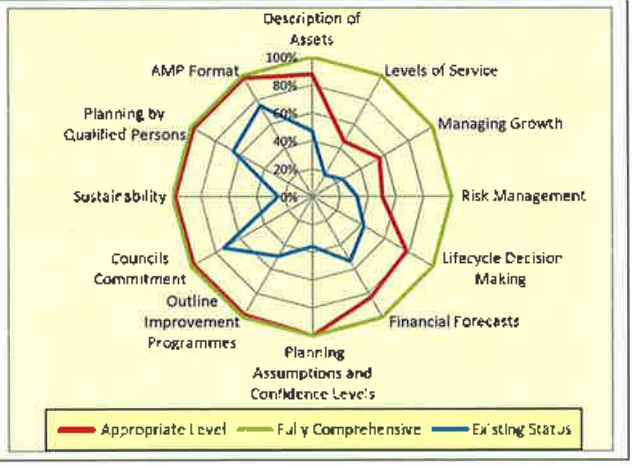
Figure 5-1: AMP Compliance Status Graphs



Rivers



Coastal Structures



6.0 ASSESSMENT OF LINKAGES AND IMPLEMENTATION OF PLAN

This Peer Review has been undertaken in terms of, and limited to the instructions provided to Waugh Infrastructure Management Limited.

In the course of the review the documents considered in or excluded from the review are as follows:

Documents considered in the review	Context/Comment
Tasman Water, Wastewater, Stormwater, Solid wastes, Transportation, Aerodromes, Rivers and Coastal structures Asset Management Plans (October 2011 and February 2012). Peer review improvement table provided by MWH in their letter dated 3rd April 2012	Document for Peer Review
INGENIUM Code of Ethics	Reference and guidance
IPENZ Code of Ethics	
NAMs Infrastructure Asset Management Manual 2006	
Local Government Act 2002	Reference
Resource Management Act 1991	
Health Act 1956 and Health (Drinking water) Amendment Act 2007	
Financial Reporting Standards (FRS 3)	

Documents Referred to within this AP and Excluded from the Review	Comment
Tasman District Council Long Term Council Community Plan 2009-2019	Reference to, or abbreviated versions of these documents are included within the Asset Management Plan. Consistency between the Asset Management Plan and the documents listed was not examined as part of this review. It is assumed that the core consistencies exist between the Management Plan and the Long Term Council Community Plan; Water and Sanitary Assessments; and the current Infrastructure Valuation. Linkages between these documents beyond those described within the Asset Management Plan were not examined.
Tasman District Council Assessment of Water and Sanitary Services	
Valuation of Infrastructure of Assets Report 2010	
Tasman District Council General and Strategic Policies not included within the Management Plan	
Tasman District Council Asset Registers	
Tasman District Council Operating Manuals	

The implementation of the Asset Management Plan was not evaluated as part of the Peer Review. An evaluation of the implementation would require interviews with a number of Tasman District Council staff to ascertain the integration of the Asset Management Plan throughout the organisation.

7.0 RECORD OF METHODOLOGY OF PEER REVIEW

Following is the methodology followed by Waugh Infrastructure Management Ltd to carry out the Peer Reviews of the Asset Management Plans:

1. Agree scope and Plans to be reviewed
2. Check for any Peer Reviewer conflicts of interest
3. Arrange for Plan and any other significant documents to be provided to the Peer Reviewer
4. Complete Peer Review of Plan as per Standard Questions/Criteria
5. Carry out Waugh Infrastructure Management internal review of Peer Review Report
6. Provide Draft Peer Review Report to Client
7. Discuss feedback from Client
8. Prepare and issue final Peer Review Report

8.0 STATEMENT OF CODE OF ETHICS

In undertaking this Peer Review, Waugh Infrastructure Management Limited Management, Staff and Associates recognise the professional responsibilities integral to undertaking a review of another professional's work.

The review has been undertaken with particular regard to the following:

INGENIUM Code of Ethics

Clause 2 PROFESSIONALISM AND INTEGRITY

INGENIUM members shall undertake their duties with professionalism and integrity, and shall work within their levels of competence.

Guidelines - Members need to:

- Exercise initiative, skill and judgement to the best of their ability at all times for the benefit of their employer and/or client
- Give decisions, recommendations or opinions that are honest, objective and factual. If these are ignored or rejected they should ensure that those affected are made aware of the possible consequences
- Accept personal responsibility for their work and work done under their supervision or direction
- Ensure that they do not misrepresent their areas or levels of experience or competence
- Take care not to disclose confidential information relating to their work or knowledge of their employer or client without the agreement of those parties
- Disclose any financial or other interest that may, or may be seen to, impair their professional judgment
- Ensure that they do not promise to, give to, or accept from any third party anything of substantial value by way of inducement
- First inform another member before reviewing their work and refrain from criticising the work of other professionals without due cause
- Uphold the reputation of INGENIUM and its members, and support other members as they seek to comply with the Code of Ethics

IPENZ Code of Ethics

Obligations owed to other engineers:

Clause 11: Not review other Engineers' work without taking reasonable steps to inform them and investigate

Waugh Infrastructure Management Limited acknowledges the cooperation of the Plan Sponsor and the Plan Writers in undertaking this Peer Review.

9.0 APPENDICES

9.1 Appendix A – Statement of Experience of Reviewers

Andrew Iremonger

Andrew is a utilities engineer and asset management specialist with 30 years experience in Local Government Asset Management and Engineering. Andrew specialises in strategic Asset Management, specifically the development and updating of Activity and Asset Management Plans, Water and Sanitary Assessments and also Lifeline Utility Plans.

Ross Waugh

Ross is a strategic asset management and systems integration specialist with over 25 years experience in Local Government Asset Management and Engineering. Major consulting strengths include Strategic Asset Management Analysis, Asset Management Planning and the integration of asset management principles into Council processes and operations.

Grant Holland

Grant is an Asset Management specialist with a wide variety of experience in local government asset management and engineering. Grant's interest in supporting communities shows through his development of models for developing Levels of Service and long term planning through to the preparation of Strategic Plans, Activity Management Plans and Maintenance Contracts.

Grant has a broad background in surveying & land development, asset management system development, and community infrastructure and amenities management.

10.0 GLOSSARY OF TERMS

Term	Definition
Peer Review	A Peer Review is an impartial and professional review of another practitioner's work. The review is undertaken in a rigorous and systematic manner with due regard to ethics and confidentiality
Peer Reviewer	A suitably qualified person who may be a staff member of a local authority, or a consultant engaged by a local authority who undertakes or coordinates the review of another organisation or consultant's plan
Plan Sponsor	The staff member of a local authority or utility provider responsible for ensuring a plan is produced. The Plan Sponsor may also fulfil a role in coordinating contributions of staff and consultants towards the development of the plan. This person may be described as the Asset Management Coordinator in the Infrastructure Asset Management Manual
Plan Writer	The author of the plan who may be a staff member of a local authority or utility provider, or a consultant engaged by a local authority. Where a plan is prepared by a number of contributors the editor who compiles the contributions may be identified as the Plan Writer

APPENDIX W. ASSET DISPOSALS

W.1 Asset Disposal Strategy

The Council does not have formal strategy documents relating to asset disposals. When any such assets reach a state where disposal needs to be considered, the Council will treat each case individually.

There are no current, or planned areas of operation that the Council wishes to divest itself of. Asset disposal therefore is a by-product of renewal or upgrade decisions that involve the replacement of assets.

Assets may also become surplus to requirements for any of the following reasons:

- under utilisation
- obsolescence
- provision exceeds required level of service
- uneconomic to upgrade or operate
- policy change
- service provided by another means (eg. private sector involvement)
- potential risk of ownership (financial, environmental, legal, social, vandalism).

Depending on the nature and value of the assets they are either:

- made safe and left in place
- removed and disposed to landfill
- removed and sold.

W.2 Disposal Standards

Council follows a practice of obtaining best available return from the disposal or sale of assets within an infrastructural activity and any net income is credited to that activity.

APPENDIX X. GLOSSARY OF ASSET MANAGEMENT TERMS

Abbreviations and Acronyms

AMP	Activity Management Plan
LGA	Local Government Act
LTP	Long Term Plan
DWSNZ	Drinking Water Standards for New Zealand
PS	Pump Station
PHRMP	Public Health Risk Management Plan
TRMP	Tasman Regional Management Plan
RWS	Rural Water Supply
TDC	Tasman District Council
UWS	Urban Water Supply
WSSA	Water and Sanitary Services Assessment
DC	Development Contribution
AMS	Asset Management System

Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
Activity Management Plan (AMP)	Activity Management Plans are key strategic documents that describe all aspects of the management of assets and services for an activity. The documents feed information directly in the Council's LTP, and place an emphasis on long term financial planning, community consultation, and a clear definition of service levels and performance standards.
Advanced Asset Management	Asset management which employs predictive modelling, risk management and optimised renewal decision making techniques to establish asset lifecycle treatment options and related long term cashflow predictions. (See Basic Asset Management).
Annual Plan	The Annual Plan provides a statement of the direction of Council and ensures consistency and co-ordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Asset	A physical component of a facility which has value, enables services to be provided and has an economic life of greater than 12 months.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.
Asset Management System (AMS)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan	A plan developed for the management of one or more infrastructure assets that combines multi-disciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost effective manner to provide a specified level of service. A significant component of the plan is a long term cashflow projection for the activities.

Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Basic Asset Management	Asset management which relies primarily on the use of an asset register, maintenance management systems, job/resource management, inventory control, condition assessment and defined levels of service, in order to establish alternative treatment options and long term cashflow predictions. Priorities are usually established on the basis of financial return gained by carrying out the work (rather than risk analysis and optimised renewal decision making).
Benefit Cost Ratio (B/C)	The sum of the present values of all benefits (including residual value, if any) over a specified period, or the life cycle of the asset or facility, divided by the sum of the present value of all costs.
Business Plan	A plan produced by an organisation (or business units within it) which translate the objectives contained in an Annual Plan into detailed work plans for a particular, or range of, business activities. Activities may include marketing, development, operations, management, personnel, technology and financial planning.
Capital Expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action.
Critical Assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Current Replacement Cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred Maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.

Disposal	Activities necessary to dispose of decommissioned assets.
Economic Life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Facility	A complex comprising many assets (eg. swimming pool complex) which represents a single management unit for financial, operational, maintenance or other purposes.
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised 'ordinary' assets as components.
I.M.S.	Infrastructure Management System - Computer Database.
Level of Service	The defined service quality for a particular activity (ie. water) or service area (ie. water quality) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life Cycle	Life cycle has two meanings: • the cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset ie. from planning and design to decommissioning or disposal • the period of time between a selected date and the last year over which the criteria (eg. costs) relating to a decision or alternative under study will be assessed.
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
Life Cycle Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.
Long Term Plan (LTP)	The Long Term Plan is the primary strategic document through which Council communicates its intentions over the next 10 years for meeting community service expectations and how it intends to fund this work. The LTP is a key output required of Local Authorities under the Local Government Act 2002. The LTP replaces the Long Term Council Community Plan (LTCCP).
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.
Net Present Value (NPV)	Net Present Value – Standard method for evaluating long-term projects in capital budgeting.
Objective	An objective is a general statement of intention relating to a specific output or activity. They are generally longer-term aims and are not necessarily outcomes that managers can control.

Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of the life cycle costs of an asset.
Optimised Renewal Decision Making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance Measure (PM)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance measures commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Planned Maintenance	Planned maintenance activities fall into three categories: • Periodic – necessary to ensure the reliability or sustain the design life of an asset. • Predictive – condition monitoring activities used to predict failure. • Preventive – maintenance that can be initiated without routine or continuous checking (eg. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Recreation	Means voluntary non-work activities for the attainment of personal and social benefits, including restoration (recreation) and social cohesion.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Renewal Accounting	A method of infrastructure asset accounting which recognises that infrastructure assets are maintained at an agreed service level through regular planned maintenance, rehabilitation and renewal programmes contained in an AMP. The system as a whole is maintained in perpetuity and therefore does not need to be depreciated. The relevant rehabilitation and renewal costs are treated as operational rather than capital expenditure and any loss in service potential is recognised as deferred maintenance.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
Remaining Economic Life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk Cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

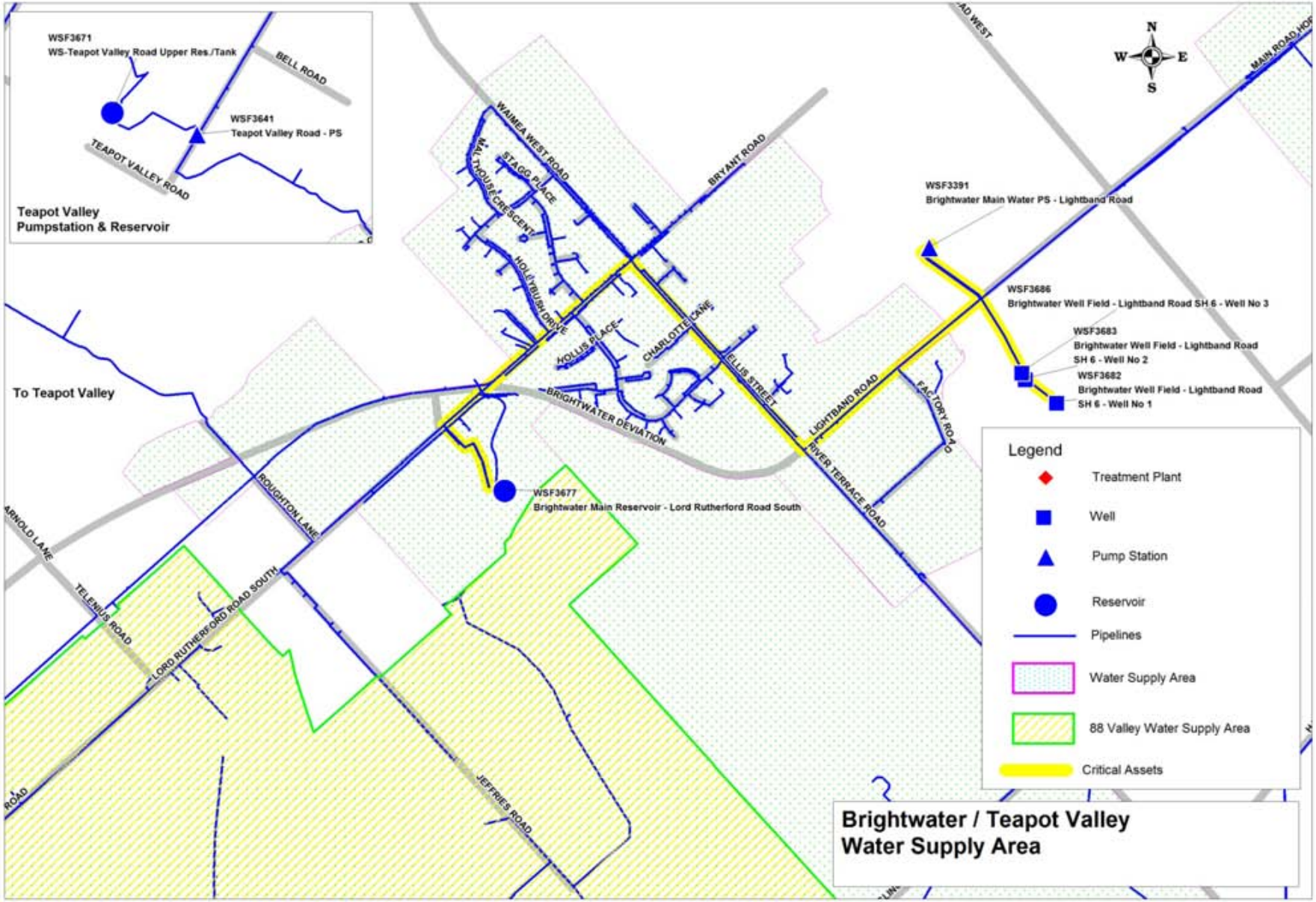
Routine Maintenance	Day to day operational activities to keep the asset operating (eg. replacement of light bulbs, cleaning of drains, repairing leaks) and which form part of the annual operating budget, including preventative maintenance.
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Strategic Plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation.
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value that may depend on the purpose for which the valuation is required, ie. replacement value for determining maintenance levels or market value for life cycle costing.

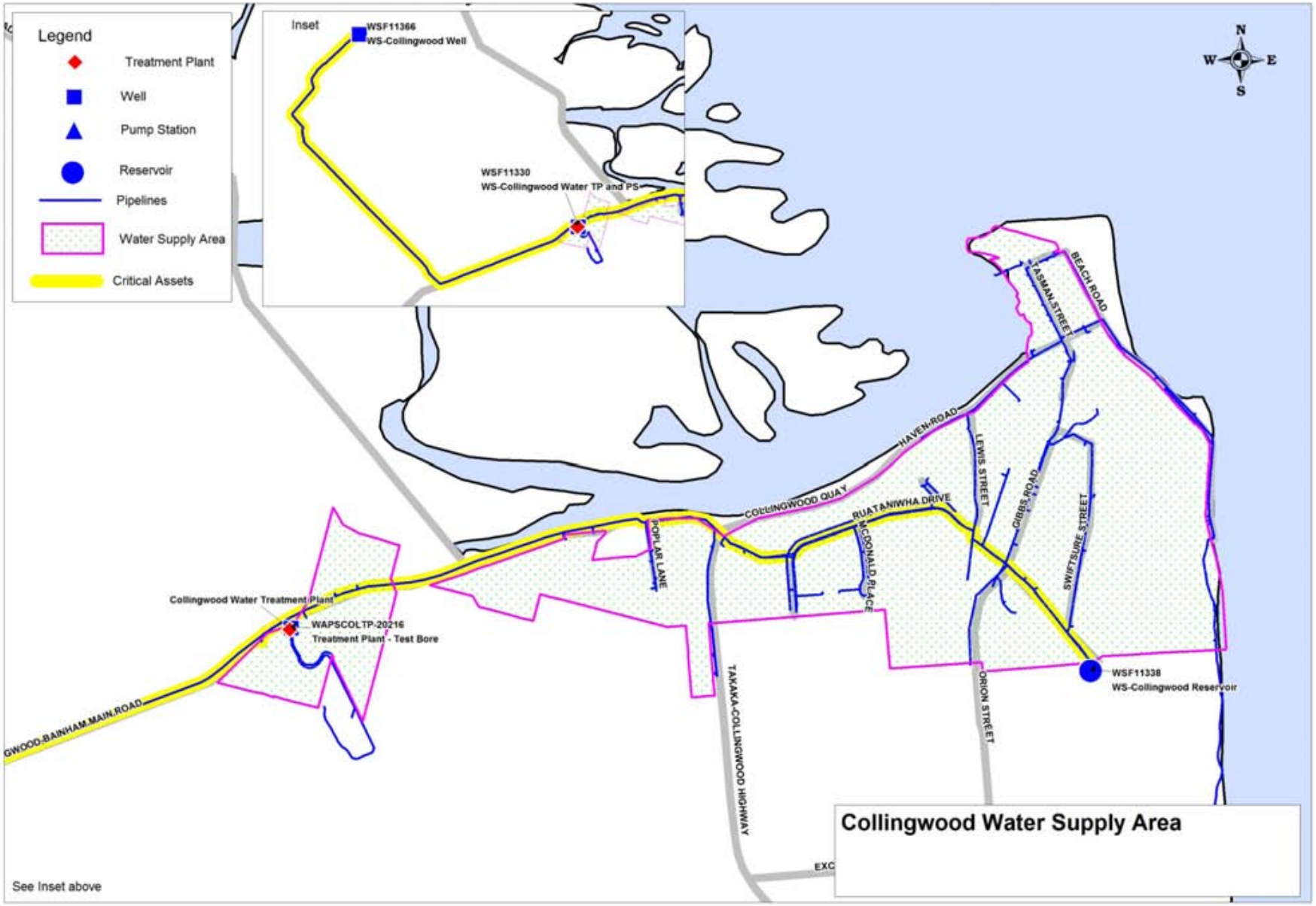
APPENDIX Y. WATER SUPPLY AREA BOUNDARIES AND FACILITIES

The area boundaries are correct as at July 2012. The boundaries are revised periodically.

- Brightwater/Teapot Valley
- Collingwood
- Dovedale
- Eighty Eight Valley
- Kaiteriteri
- Mapua
- Motueka
- Murchison
- Pohara
- Redwood Valley
- Richmond/Waimea North (Richmond Supply Wells)
- Richmond/Waimea North (Waimea Water Treatment and Supply Wells)
- Richmond/Waimea South East
- Richmond/Waimea South West
- Tapawera
- Upper Takaka
- Wakefield

The current version is located in the LTP.


WSF3671
WS-Teapot Valley Road Upper Res./Tank
BELL ROAD
WSF3641
Teapot Valley Road - PS
TEAPOT VALLEY ROAD
Teapot Valley
Pumpstation & Reservoir
To Teapot Valley
WAIMEA WEST ROAD
STAGG PLACE
WALTHOUS CRESCENT
HOLLYBUSH DRIVE
BRYANT ROAD
HOLLIS PLACE
CHARLOTTE LANE
ELLIS STREET
BRIGHTWATER DEVIATION
WSF3677
Brightwater Main Reservoir - Lord Rutherford Road South
ROUGHTON LANE
ARNOLD LANE
TELENIUS ROAD
LORD RUTHERFORD ROAD SOUTH
JEFFRIES ROAD
WSF3391
Brightwater Main Water PS - Lightband Road
WSF3686
Brightwater Well Field - Lightband Road SH 6 - Well No 3
WSF3683
Brightwater Well Field - Lightband Road
SH 6 - Well No 2
WSF3682
Brightwater Well Field - Lightband Road
SH 6 - Well No 1
LIGHTBAND ROAD
FACTORY ROAD
RIVER TERRACE ROAD
MAIN ROAD HOP
N
W
E
S
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
88 Valley Water Supply Area
Critical Assets
Brightwater / Teapot Valley
Water Supply Area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Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Inset
WSF11366
WS-Collingwood Well
WSF11330
WS-Collingwood Water TP and PS
N
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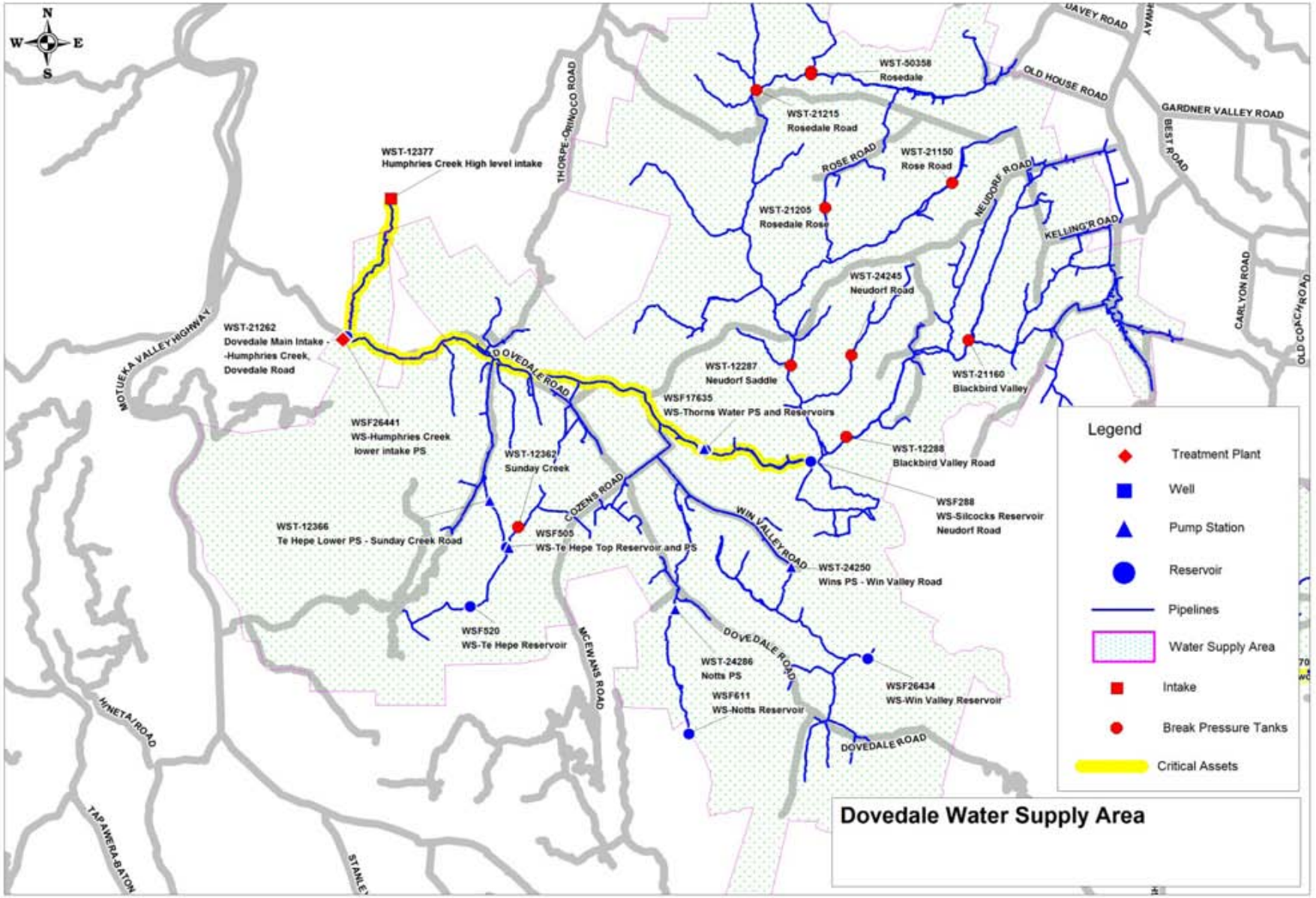
BEACH ROAD
TASMAN STREET
HAVEN ROAD
COLLINGWOOD QUAY
RUATANIWHA DRIVE
LEWIS STREET
GIBBS ROAD
SWIFTSURE STREET
McDONALD PLACE
POPLAR LANE
Collingwood Water Treatment Plant
WAPSCOLTP-20216
Treatment Plant - Test Bore
GWOOD-BAINHAM MAIN ROAD
TAKAKA-COLLINGWOOD HIGHWAY
ORION STREET
WSF11338
WS-Collingwood Reservoir
Collingwood Water Supply Area
See Inset above


N
W
E
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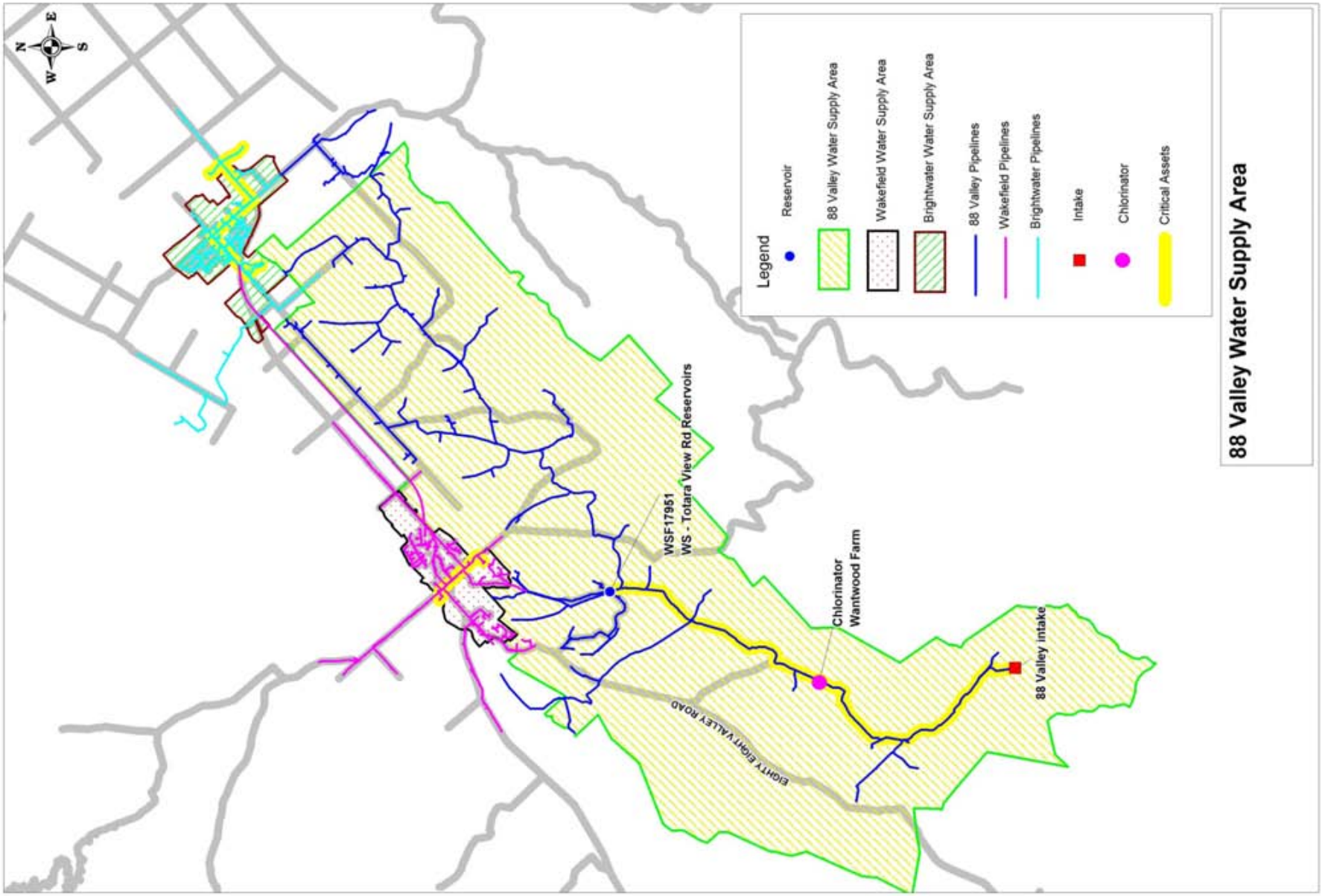
WST-12377
Humphries Creek High level intake
THORPE-ORINOCO ROAD
WST-50358
Rosedale
OLD HOUSE ROAD
GARDNER VALLEY ROAD
WST-21215
Rosedale Road
ROSE ROAD
WST-21150
Rose Road
NEUDORF ROAD
BEST ROAD
WST-21205
Rosedale Rose
KELLING ROAD
WST-24245
Neudorf Road
CARLYON ROAD
WST-21262
Dovedale Main Intake -
-Humphries Creek,
Dovedale Road
MOTUEKA VALLEY HIGHWAY
DOVEDALE ROAD
WST-12287
Neudorf Saddle
WST-21160
Blackbird Valley
WSF17635
WS-Thorns Water PS and Reservoirs
WSF26441
WS-Humphries Creek
lower intake PS
WST-12362
Sunday Creek
WST-12288
Blackbird Valley Road
COZENS ROAD
WST-12366
Te Hepe Lower PS - Sunday Creek Road
WSF288
WS-Silcocks Reservoir
Neudorf Road
WSF505
WS-Te Hepe Top Reservoir and PS
WIN VALLEY ROAD
WST-24250
Wins PS - Win Valley Road
WSF520
WS-Te Hepe Reservoir
MCEWANS ROAD
DOVEDALE ROAD
WST-24286
Notts PS
WSF611
WS-Notts Reservoir
WSF26434
WS-Win Valley Reservoir
HIHNETA ROAD
TAPAWERA-BATON
DOVEDALE ROAD
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Intake
Break Pressure Tanks
Critical Assets
Dovedale Water Supply Area


N
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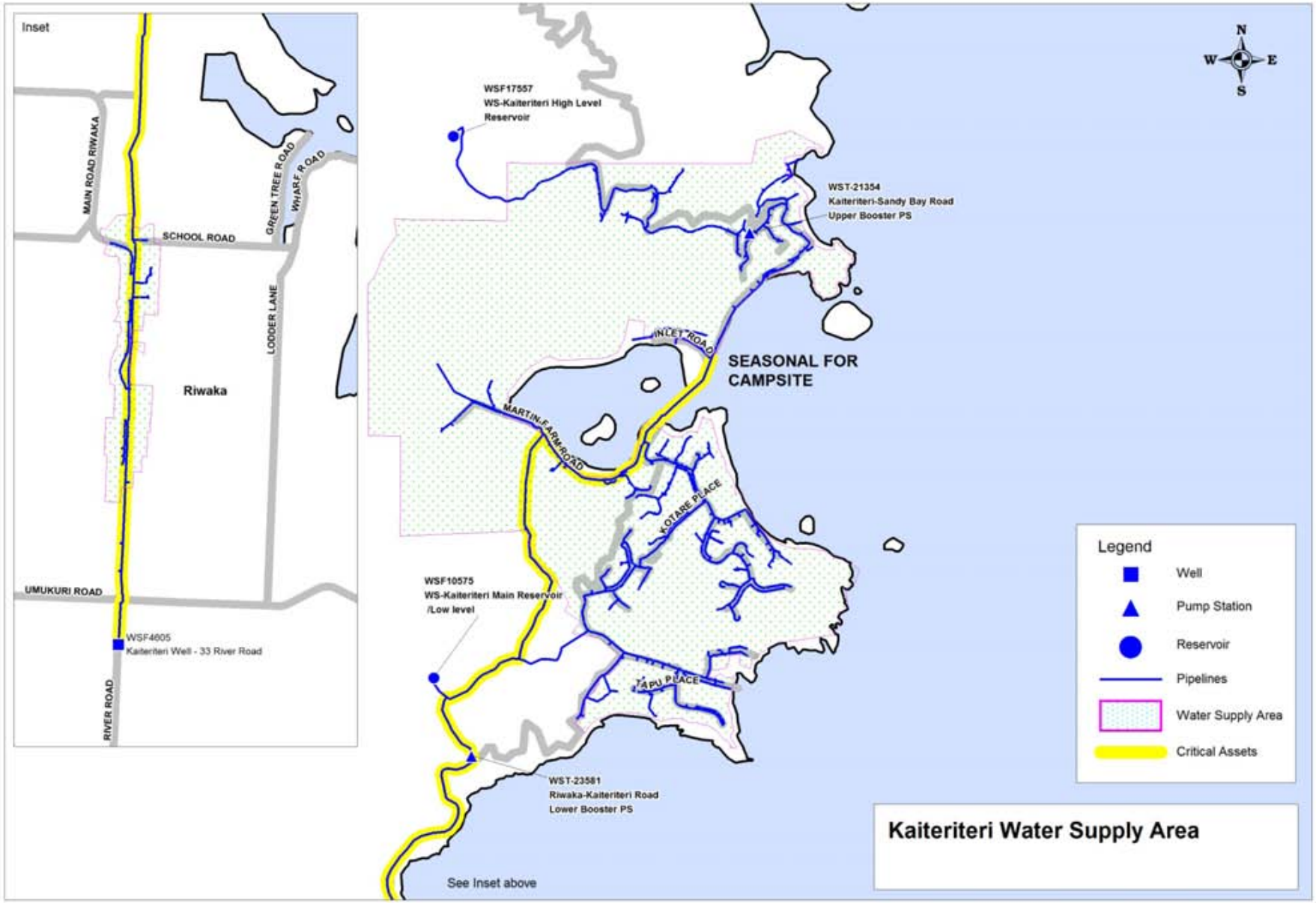
Legend
Reservoir
88 Valley Water Supply Area
Wakefield Water Supply Area
Brightwater Water Supply Area
88 Valley Pipelines
Wakefield Pipelines
Brightwater Pipelines
Intake
Chlorinator
Critical Assets
88 Valley Water Supply Area
WSF17951
WS - Totara View Rd Reservoirs
Chlorinator
Wantwood Farm
88 Valley intake
EIGHTY EIGHT VALLEY ROAD


Inset
MAIN ROAD RIWAKA
GREEN TREE ROAD
WHARF ROAD
SCHOOL ROAD
LODDER LANE
Riwaka
UMUKURI ROAD
WSF4605
Kaiteriteri Well - 33 River Road
RIVER ROAD
WSF17557
WS-Kaiteriteri High Level
Reservoir
WST-21354
Kaiteriteri-Sandy Bay Road
Upper Booster PS
INLET ROAD
SEASONAL FOR
CAMPSITE
MARTIN FARM ROAD
KOTARE PLACE
WSF10575
WS-Kaiteriteri Main Reservoir
/Low level
TAPU PLACE
WST-23581
Riwaka-Kaiteriteri Road
Lower Booster PS
See Inset above
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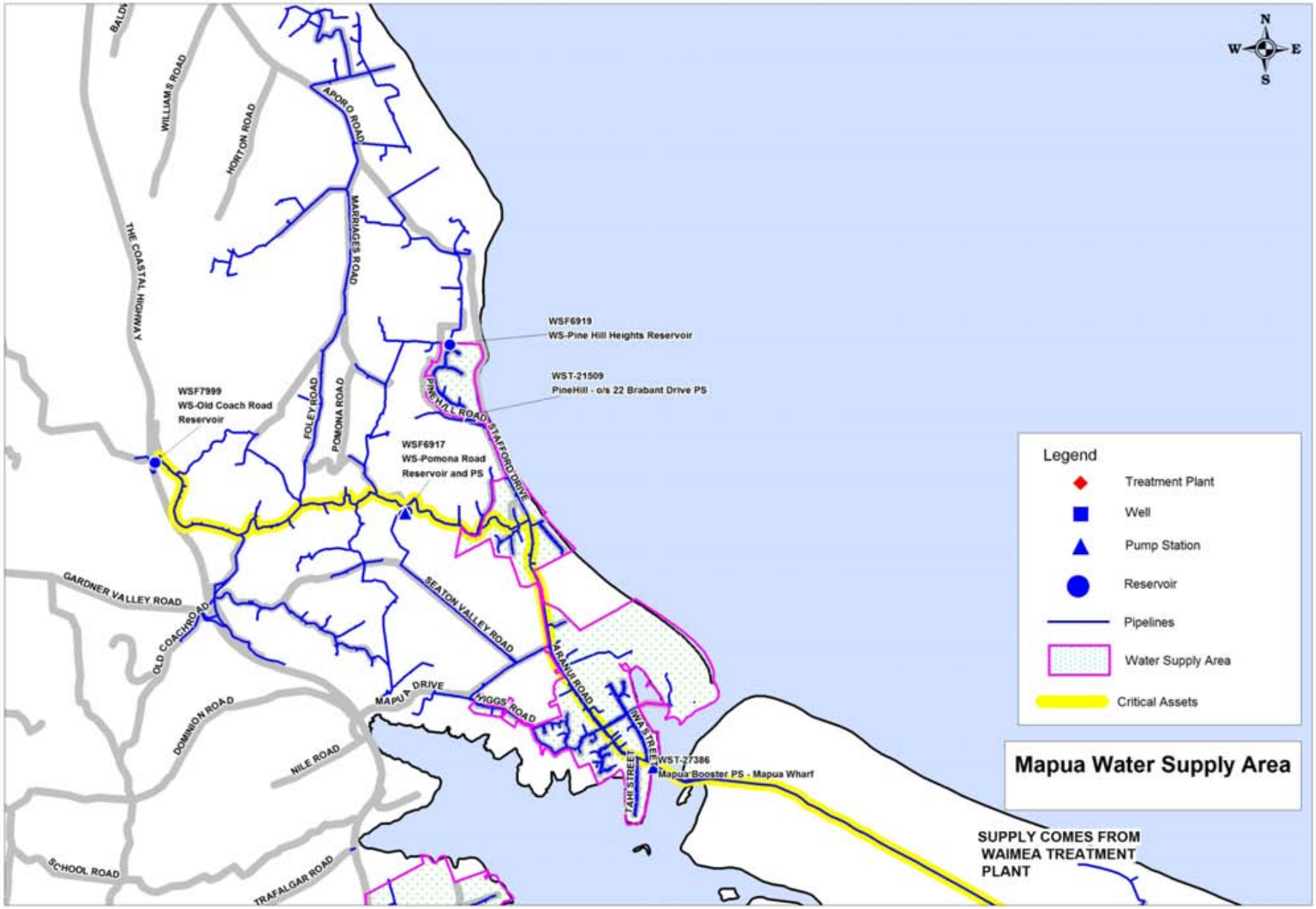
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Kaiteriteri Water Supply Area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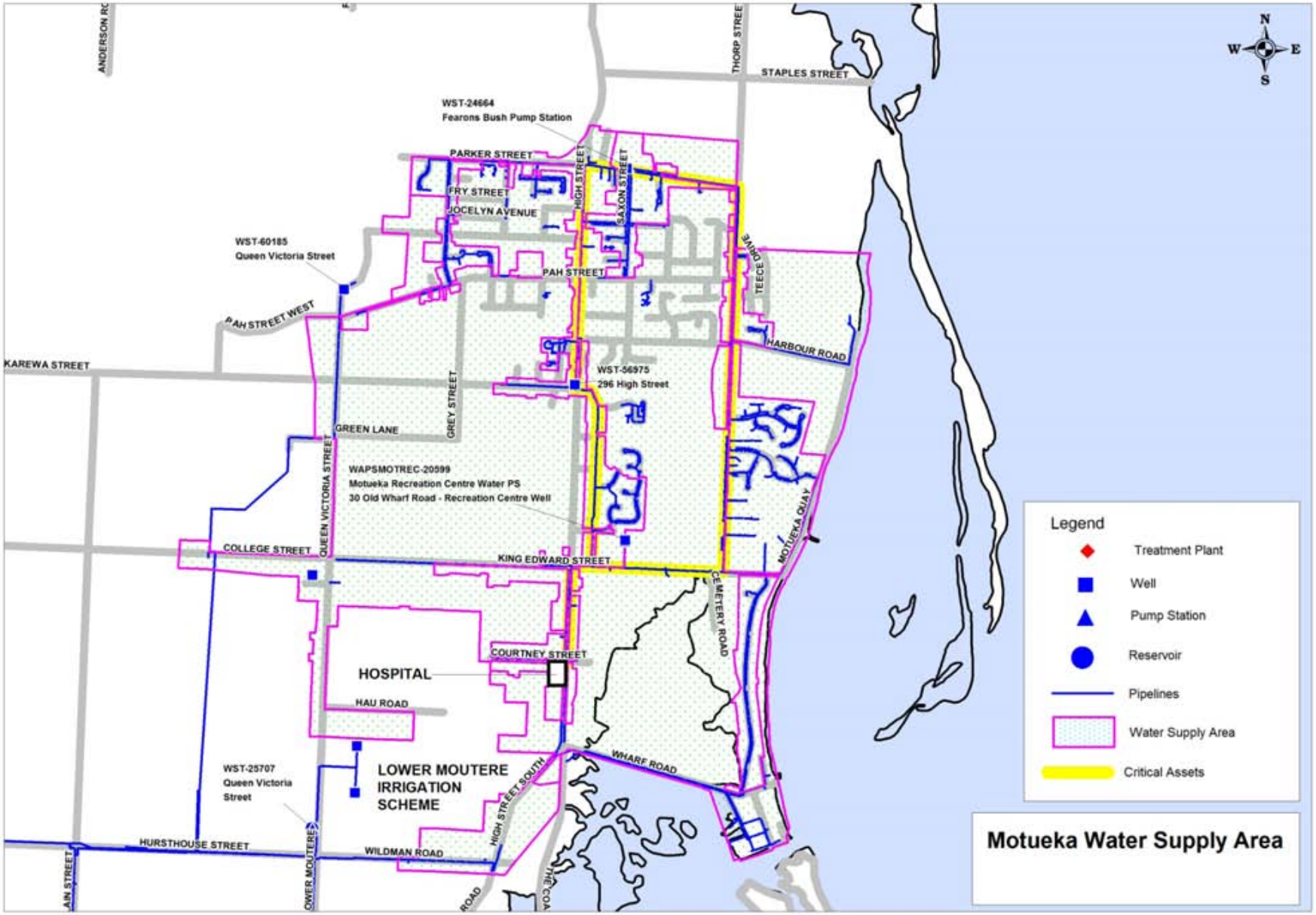
WILLIAMS ROAD
HORTON ROAD
APORO ROAD
MARRIAGES ROAD
THE COASTAL HIGHWAY
FOLEY ROAD
POMONA ROAD
PINEHILL ROAD
STAFFORD DRIVE
WSF6919
WS-Pine Hill Heights Reservoir
WST-21509
PineHill - o/s 22 Brabant Drive PS
WSF7999
WS-Old Coach Road
Reservoir
WSF6917
WS-Pomona Road
Reservoir and PS
GARDNER VALLEY ROAD
OLD COACH ROAD
SEATON VALLEY ROAD
MAPUA DRIVE
HIGGS ROAD
WAHANUI ROAD
MAIN STREET
TAHI STREET
WST-27386
Mapua Booster PS - Mapua Wharf
DOMINION ROAD
NILE ROAD
SCHOOL ROAD
TRAFALGAR ROAD
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Mapua Water Supply Area
SUPPLY COMES FROM
WAIMEA TREATMENT
PLANT


N
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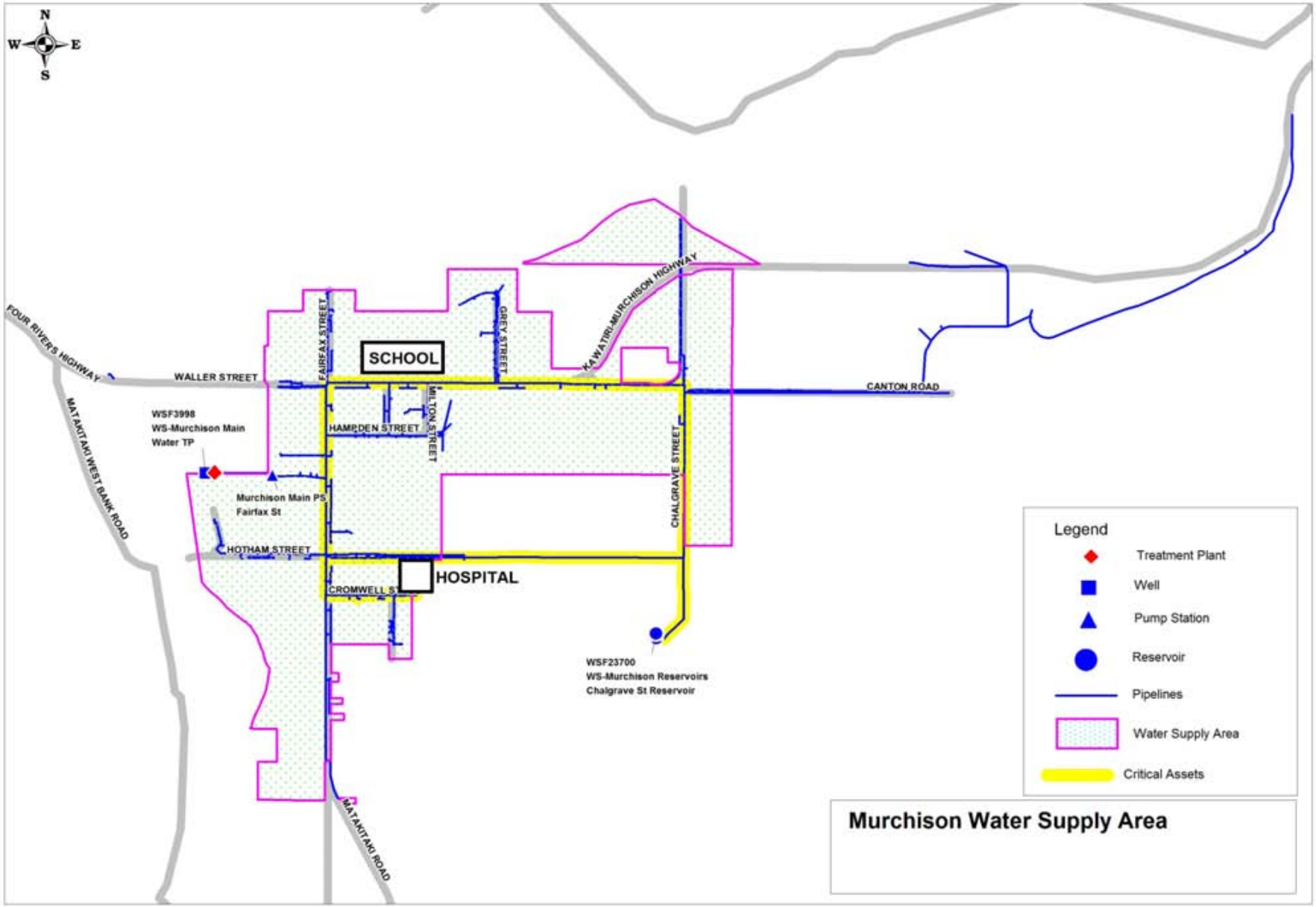
STAPLES STREET
WST-24664
Fearons Bush Pump Station
PARKER STREET
FRY STREET
JOCELYN AVENUE
HIGH STREET
SAXON STREET
THORP STREET
TEECE DRIVE
WST-60185
Queen Victoria Street
PAH STREET
PAH STREET WEST
HARBOUR ROAD
KAREWA STREET
WST-56975
296 High Street
GREY STREET
GREEN LANE
QUEEN VICTORIA STREET
WAPSMOTREC-20599
Motueka Recreation Centre Water PS
30 Old Wharf Road - Recreation Centre Well
MOTUEKA QUAY
COLLEGE STREET
KING EDWARD STREET
CEMETERY ROAD
COURTNEY STREET
HOSPITAL
HAU ROAD
WST-25707
Queen Victoria Street
LOWER MOUTERE IRRIGATION SCHEME
WHARF ROAD
HIGH STREET SOUTH
HURSTHOUSE STREET
WILDMAN ROAD
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Motueka Water Supply Area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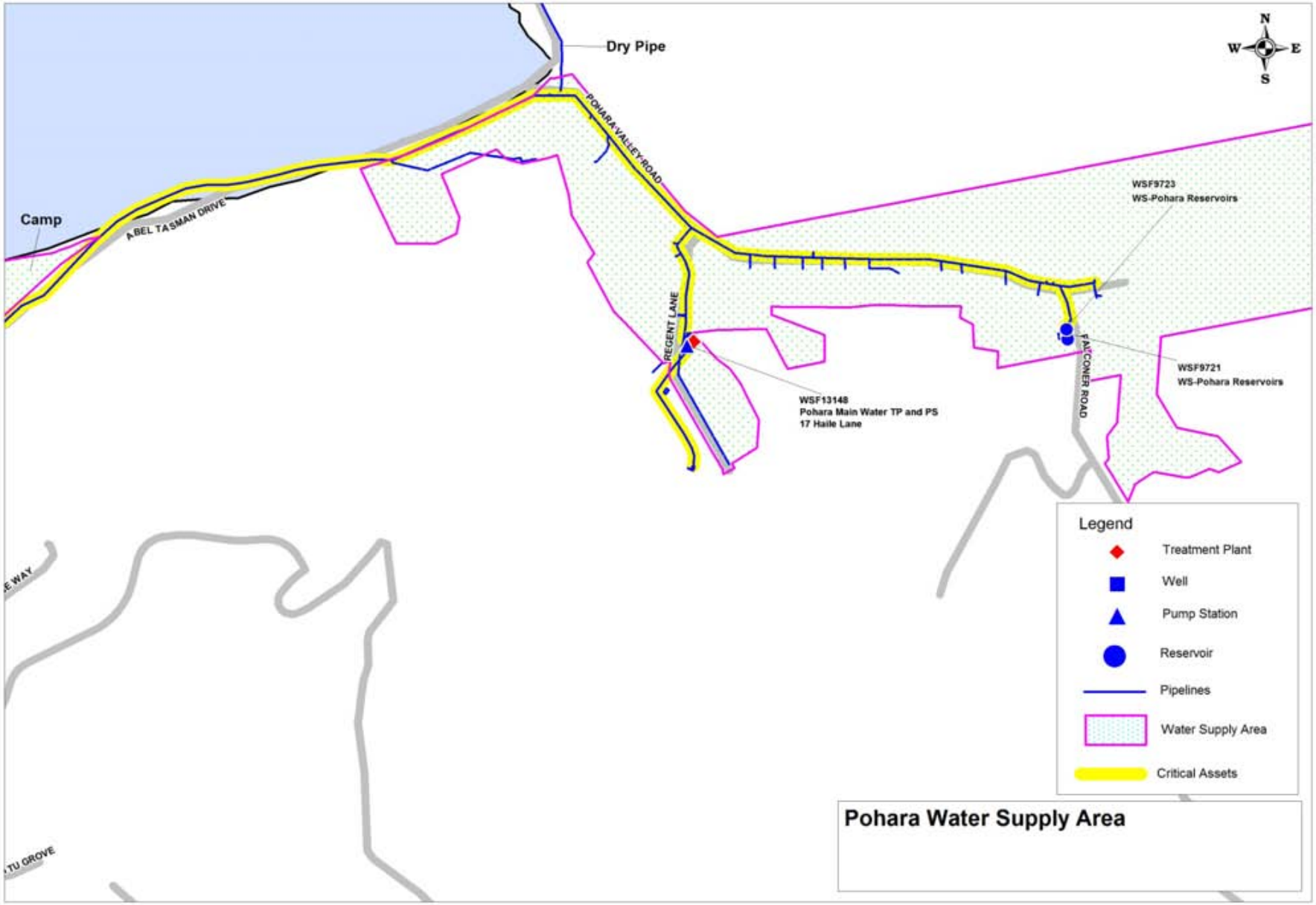
FOUR RIVERS HIGHWAY
WALLER STREET
FAIRFAX STREET
SCHOOL
GREY STREET
KAWATIRI-MURCHISON HIGHWAY
CANTON ROAD
MATAKITAKI WEST BANK ROAD
WSF3998
WS-Murchison Main
Water TP
HAMPDEN STREET
MILTON STREET
CHALGRAVE STREET
Murchison Main PS
Fairfax St
HOTHAM STREET
HOSPITAL
CROMWELL ST
WSF23700
WS-Murchison Reservoirs
Chalgrave St Reservoir
MATAKITAKI ROAD
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Murchison Water Supply Area


Dry Pipe
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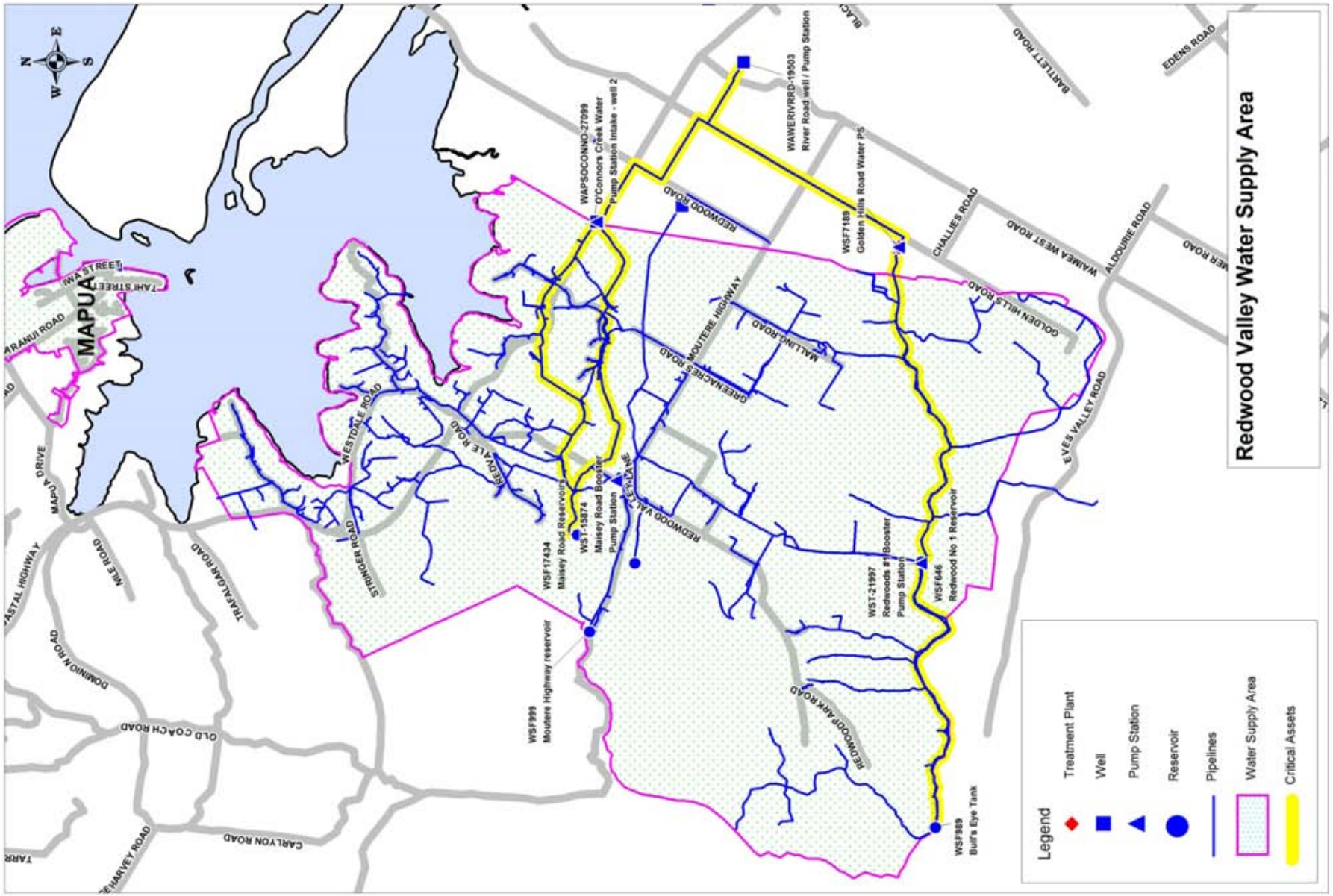
POHARA VALLEY ROAD
Camp
ABEL TASMAN DRIVE
WSF9723
WS-Pohara Reservoirs
REGENT LANE
FALCONER ROAD
WSF9721
WS-Pohara Reservoirs
WSF13148
Pohara Main Water TP and PS
17 Haile Lane
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Pohara Water Supply Area


Redwood Valley Water Supply Area
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
WAPSOCONNO-27099
O'Connors Creek Water Pump Station Intake - well 2
WAWERIVRRD-19503
River Road well / Pump Station
WSF7189
Golden Hills Road Water PS
WSF17434
Maisey Road Reservoirs
WST-15874
Maisey Road Booster Pump Station
WST-21997
Redwoods #1 Booster Pump Station
WSF646
Redwood No 1 Reservoir
WSF999
Moutere Highway reservoir
WSF989
Bull's Eye Tank
REDWOOD ROAD
WESTDALE ROAD
GREENACRES ROAD
MOUTERE HIGHWAY
MALLING ROAD
GOLDEN HILLS ROAD
CHALLIES ROAD
WAIMEA WEST ROAD
ALDOURIE ROAD
EDENS ROAD
BARTLETT ROAD
EVES VALLEY ROAD
REDWOOD VALLEY
REDWOOD PARK ROAD
STRINGER ROAD
TRAFALGAR ROAD
OLD COACH ROAD
CARLYON ROAD
HARVEY ROAD
DOMINION ROAD
MAPUA DRIVE
ARANUI ROAD
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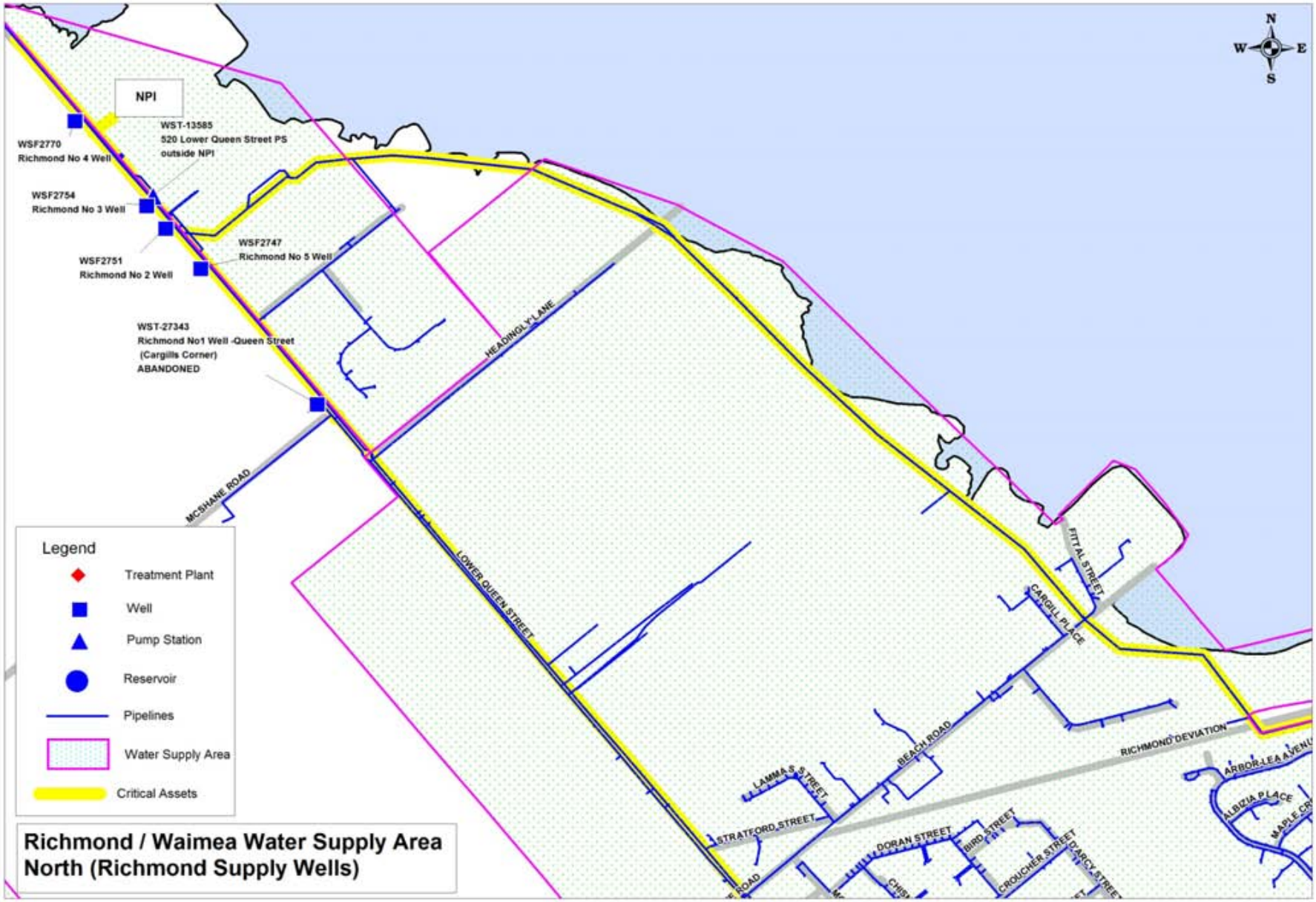
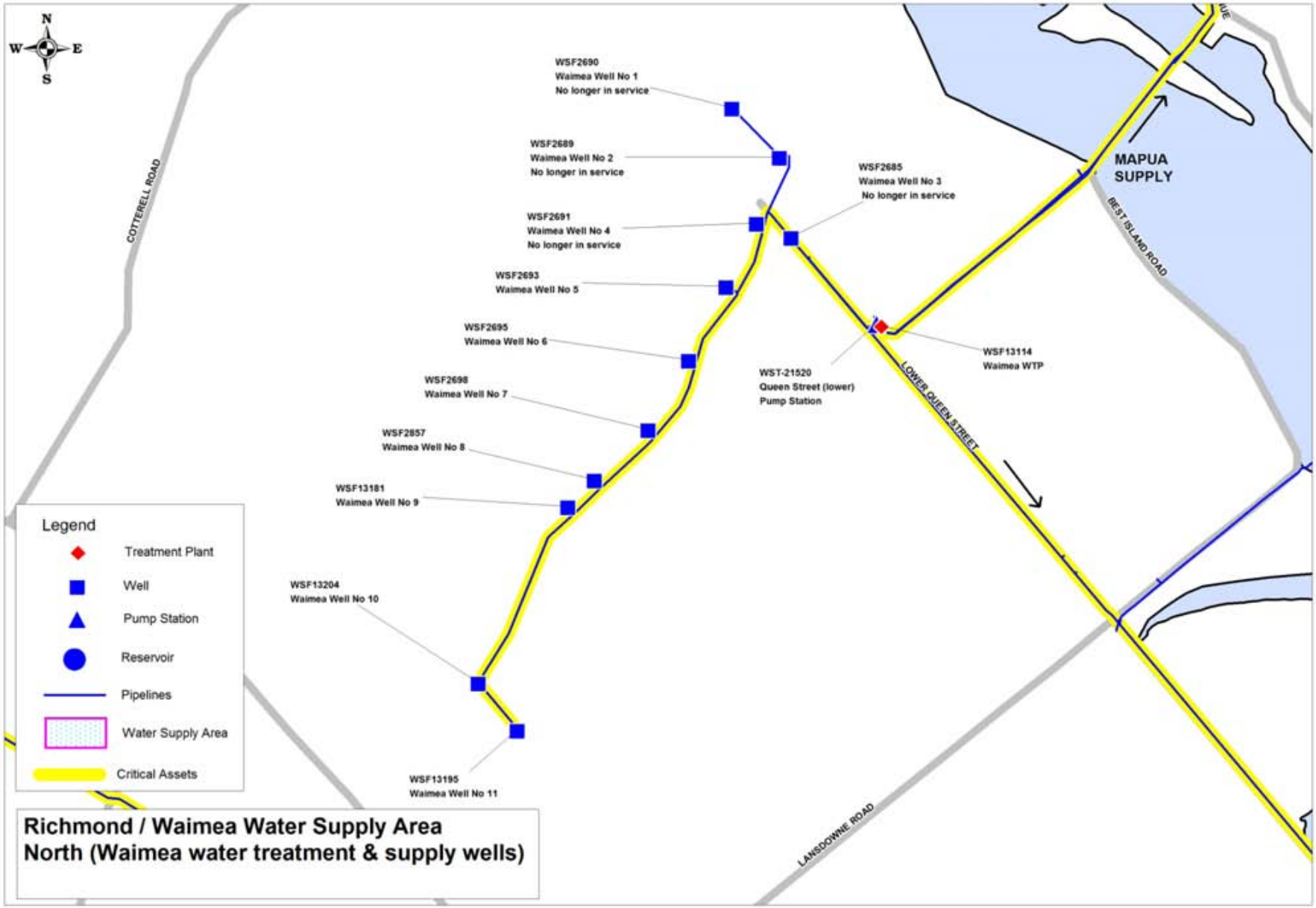
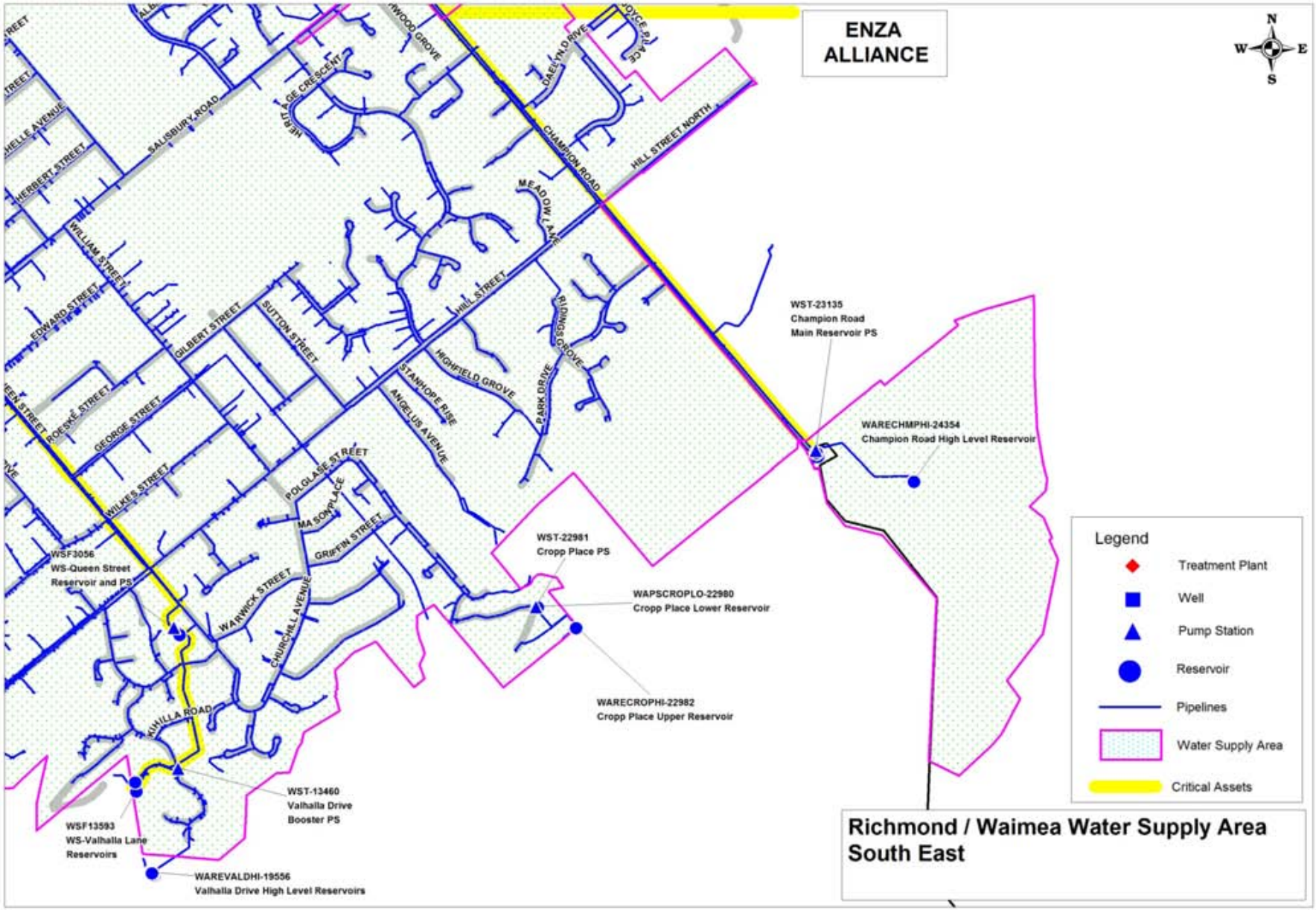
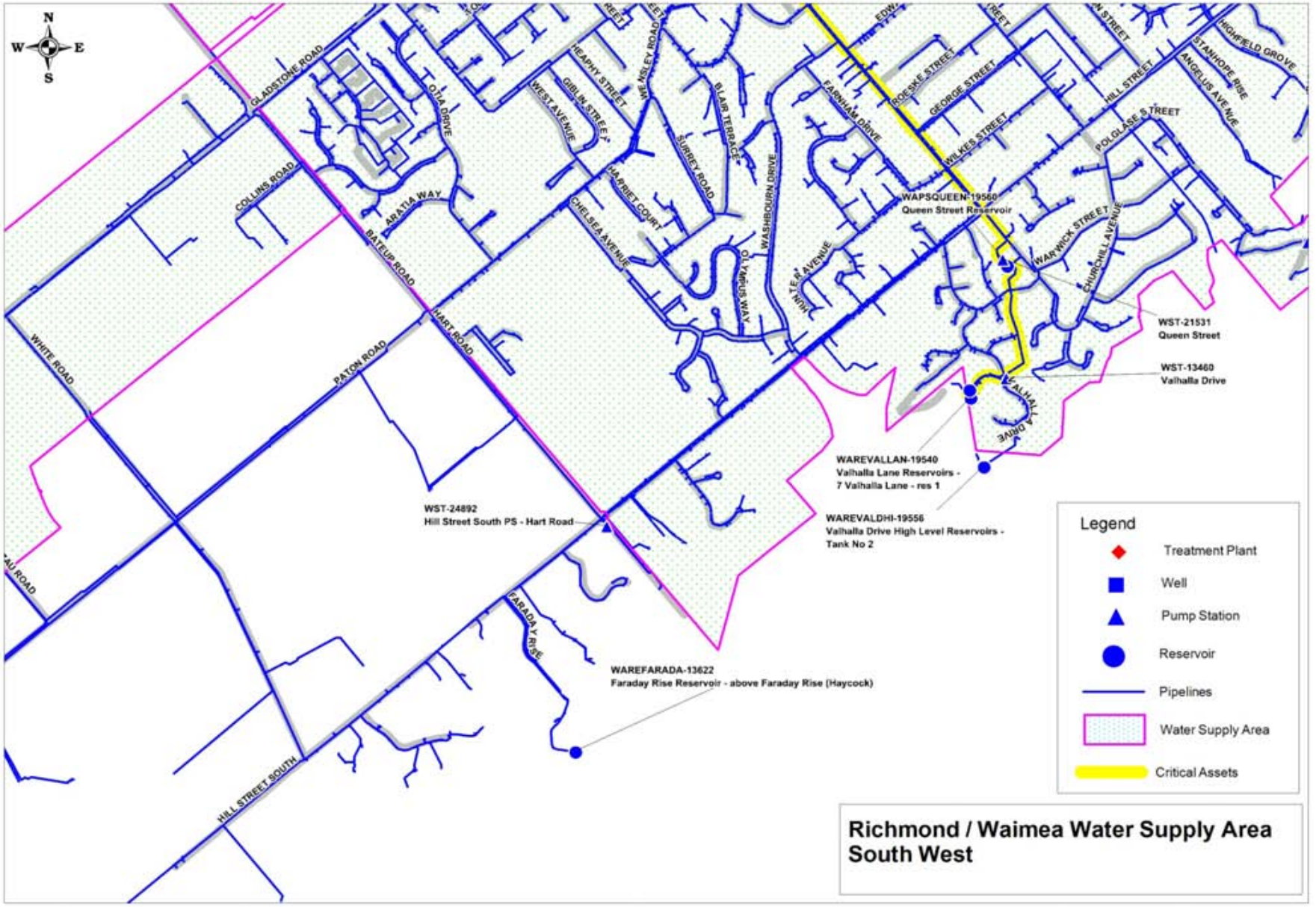
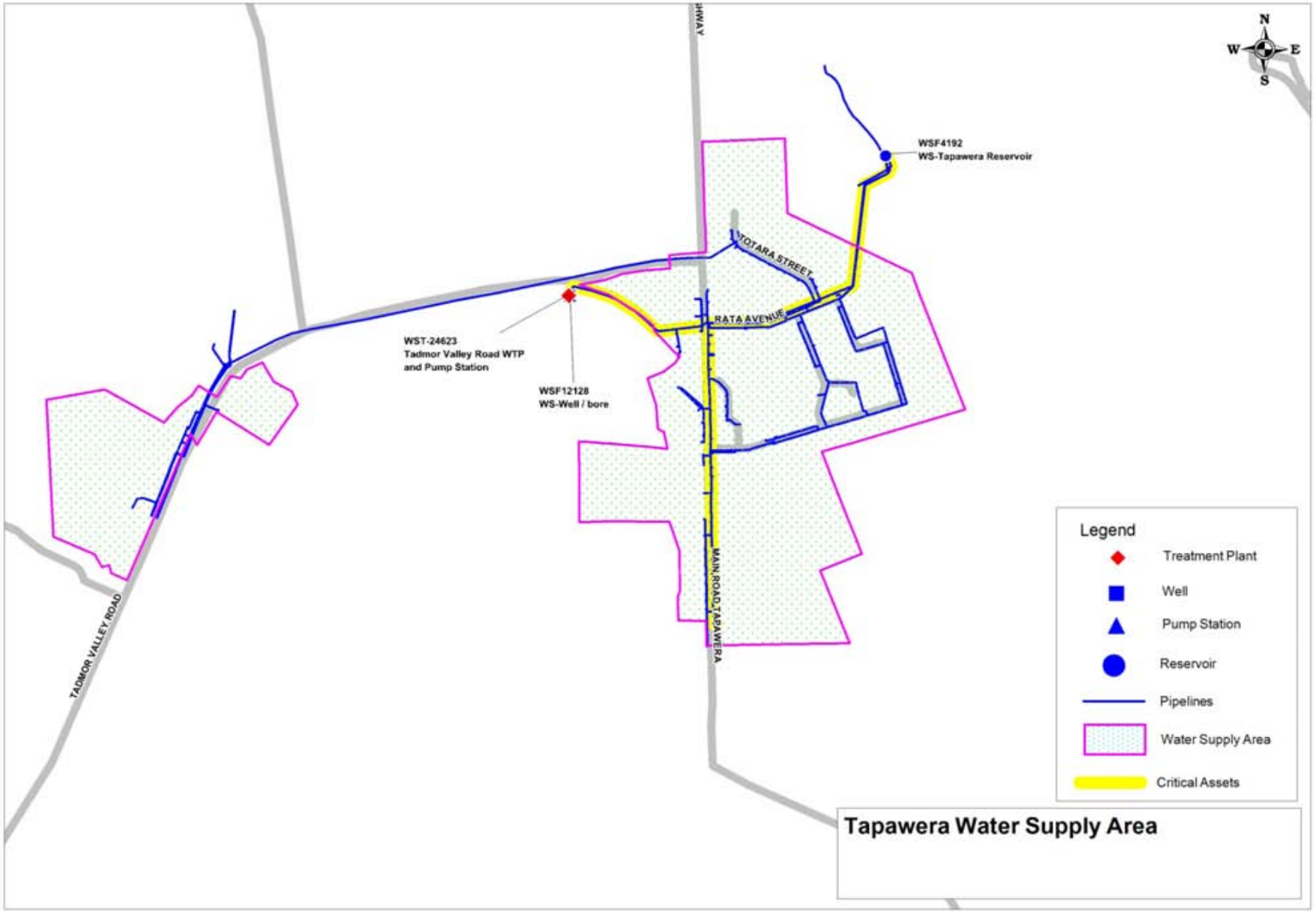
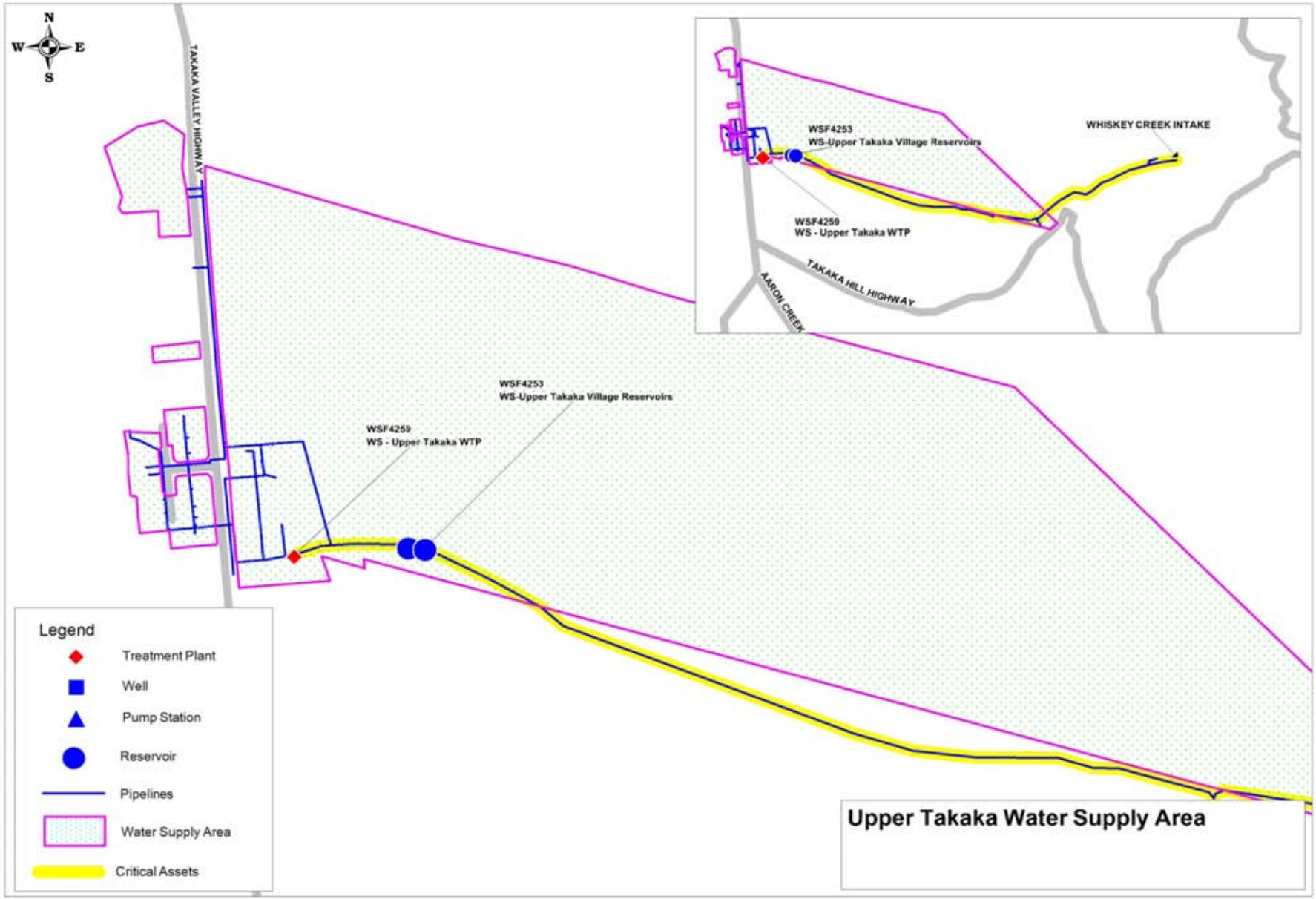

NPI
WST-13585
520 Lower Queen Street PS
outside NPI
WSF2770
Richmond No 4 Well
WSF2754
Richmond No 3 Well
WSF2747
Richmond No 5 Well
WSF2751
Richmond No 2 Well
WST-27343
Richmond No1 Well -Queen Street
(Cargills Corner)
ABANDONED
HEADINGLY LANE
MCSHANE ROAD
LOWER QUEEN STREET
FITTAL STREET
CARGILL PLACE
BEACH ROAD
RICHMOND DEVIATION
LAMMAS STREET
STRATFORD STREET
DORAN STREET
BIRD STREET
CROUCHER STREET
D'ARCY STREET
ARBOR LEA AVENUE
ALBIZIA PLACE
N
W
E
S
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Richmond / Waimea Water Supply Area
North (Richmond Supply Wells)

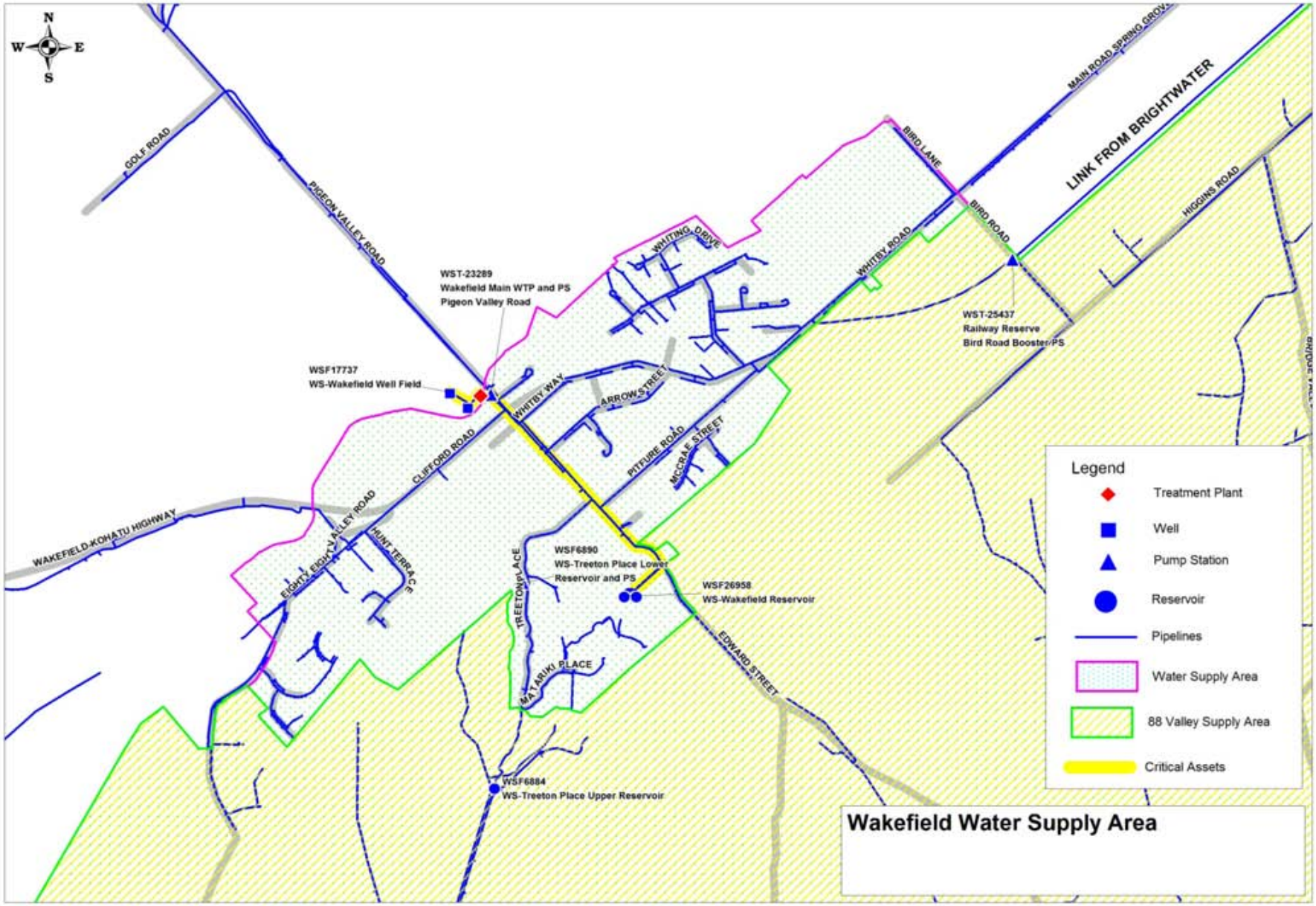

N
W
E
S
WSF2690
Waimea Well No 1
No longer in service
WSF2689
Waimea Well No 2
No longer in service
WSF2685
Waimea Well No 3
No longer in service
WSF2691
Waimea Well No 4
No longer in service
WSF2693
Waimea Well No 5
WSF2695
Waimea Well No 6
WSF2698
Waimea Well No 7
WSF2857
Waimea Well No 8
WSF13181
Waimea Well No 9
WSF13204
Waimea Well No 10
WSF13195
Waimea Well No 11
WST-21520
Queen Street (lower)
Pump Station
WSF13114
Waimea WTP
MAPUA
SUPPLY
COTTERELL ROAD
BEST ISLAND ROAD
LOWER QUEEN STREET
LANSDOWNE ROAD
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Richmond / Waimea Water Supply Area
North (Waimea water treatment & supply wells)


ENZA ALLIANCE
N
W
E
S
SALISBURY ROAD
HERBERT STREET
WILLIAM STREET
EDWARD STREET
GILBERT STREET
SUTTON STREET
GEORGE STREET
ROESKE STREET
WILKES STREET
HILL STREET
HILL STREET NORTH
CHAMPION ROAD
MEADOWBANK
RIDINGS GROVE
PARK DRIVE
HIGHFIELD GROVE
STANHOPE RISE
ANGELUS AVENUE
POLGLASE STREET
MASON PLACE
GRIFFIN STREET
WARWICK STREET
CHURCHILL AVENUE
KINLLA ROAD
WST-23135
Champion Road
Main Reservoir PS
WARECHMPHI-24354
Champion Road High Level Reservoir
WST-22981
Cropp Place PS
WAPSCROPLO-22980
Cropp Place Lower Reservoir
WARECROPHI-22982
Cropp Place Upper Reservoir
WSF3056
WS-Queen Street
Reservoir and PS
WST-13460
Valhalla Drive
Booster PS
WSF13593
WS-Valhalla Lane
Reservoirs
WAREVALDHI-19556
Valhalla Drive High Level Reservoirs
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Richmond / Waimea Water Supply Area
South East


N
W
E
S
GLADSTONE ROAD
COLLINS ROAD
ARATIA WAY
OTIA DRIVE
BATEUP ROAD
WHITE ROAD
PATON ROAD
HART ROAD
WEST AVENUE
GIBLIN STREET
HEAPHY STREET
McINSLEY ROAD
CHELSEA AVENUE
HARRIET COURT
SURREY ROAD
BLAIR TERRACE
WASHBOURN DRIVE
OLYMPUS WAY
FARNHAM DRIVE
ROBSKE STREET
GEORGE STREET
WILKES STREET
HILL STREET
POLGLASE STREET
HIGHFIELD GROVE
STANHOPE RISE
ANGELUS AVENUE
WARWICK STREET
CHURCHILL AVENUE
VALHALLA DRIVE
FARADAY RISE
HILL STREET SOUTH
WAPSQUEEN-19560
Queen Street Reservoir
WST-21531
Queen Street
WST-13460
Valhalla Drive
WAREVALLAN-19540
Valhalla Lane Reservoirs -
7 Valhalla Lane - res 1
WAREVALDHI-19556
Valhalla Drive High Level Reservoirs -
Tank No 2
WST-24892
Hill Street South PS - Hart Road
WAREFARADA-13622
Faraday Rise Reservoir - above Faraday Rise (Haycock)
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Richmond / Waimea Water Supply Area
South West


N
W
E
S
WSF4192
WS-Tapawera Reservoir
TOTARA STREET
RATA AVENUE
WST-24623
Tadmor Valley Road WTP
and Pump Station
WSF12128
WS-Well / bore
TADMOR VALLEY ROAD
MAIN ROAD TAPAWERA
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Tapawera Water Supply Area


N
W
E
S
TAKAKA VALLEY HIGHWAY
WSF4253
WS-Upper Takaka Village Reservoirs
WSF4259
WS - Upper Takaka WTP
WHISKEY CREEK INTAKE
TAKAKA HILL HIGHWAY
AARON CREEK
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
Critical Assets
Upper Takaka Water Supply Area


N
W
E
S
GOLF ROAD
PIGEON VALLEY ROAD
WST-23289
Wakefield Main WTP and PS
Pigeon Valley Road
WSF17737
WS-Wakefield Well Field
WHITBY WAY
WHITING DRIVE
ARROWS STREET
PITTURE ROAD
MCCRAE STREET
CLIFFORD ROAD
WHITBY ROAD
BIRD LANE
BIRD ROAD
MAIN ROAD SPRING GROVE
LINK FROM BRIGHTWATER
HIGGINS ROAD
WST-25437
Railway Reserve
Bird Road Booster PS
WAKEFIELD-KOHATU HIGHWAY
EIGHTY EIGHT VALLEY ROAD
HUNT TERRACE
TREETON PLACE
WSF6890
WS-Treeton Place Lower
Reservoir and PS
WSF26958
WS-Wakefield Reservoir
MATARIKI PLACE
EDWARD STREET
WSF6884
WS-Treeton Place Upper Reservoir
Legend
Treatment Plant
Well
Pump Station
Reservoir
Pipelines
Water Supply Area
88 Valley Supply Area
Critical Assets
Wakefield Water Supply Area

APPENDIX Z. AMP STATUS AND DEVELOPMENT PROCESS

Z.1 AMP Status

Version	Status	Document Approval	Signature	Date
1	Working Draft			
2	Draft for Council Officer Review	Name: Becky Marsay Authority: Project Technical Lead		16 Feb 2012
3	Draft for Council Review	Name: Jeff Cuthbertson Authority: Asset Manager		
4	Draft for Public Consultation through LTP	Name: Peter Thomson Authority: Engineering Manager		
5	Final Plan Adopted by Council Council Resolution	Name: Richard Kempthorne Authority: Mayor Reference: _____		

Z.2 AMP Development Process

Project Sponsor:	Peter Thomson
Asset Manager:	Jeff Cuthbertson
Project Manager:	Stephen Sinclair
Project Technical Lead:	Becky Marsay
AMP Author:	David Light
Project Team:	Kim Arnold, Jeff Cuthbertson, Helen Barwick, Gillian Bullock – Water Quality, DWSNZ Compliance Seb Head, James Tomkinson Paul Barratt, Phil Benvin– Operations and Maintenance Richard Lester, Denis O'Brien, Dugall Wilson

Z.3 Quality Plan

This quality plan comprises three parts.

1. Quality Requirements and Issues – identification of the quality standards required and the quality issues that might arise.
2. Quality Assurance – the planned approach to ensure quality requirements are pro-actively met – ie. get it right first time.
3. Quality Control – the monitoring of the project implementation to ensure quality outcomes are met.

Z.4 Quality Requirements and Issues

	Issues and Requirements	Description
1	Fitness for Purpose	The AMP has to be "fit for purpose". It has to comply with Audit NZ expectations of what an AMP should be to provide them the confidence that the Council is adequately managing the Council activities.
2	AMP Document Consistency	Council want a high level of consistency between AMPs so that a reader can comfortably switch between plans.
3	AMP Document Format	The documents need to be prepared to a consistent and robust format so that the electronic documents are not corrupted (as happens to large documents that have been put together with a lot of cutting and pasting) and can be made available digitally over the internet.
4	AMP Text Accuracy and Currentness	The AMPs are large and include a lot of detail. Errors or outdated statements reduce confidence in the document. The AMPs need to be updated to current information and statistics.
5	AMP Readability	The AMPs in their current form have duplication – where text is repeated in the "front" section and the Appendices. This needs to be rationalised so that the front section is slim and readable and the Appendix contains the detail without unnecessary duplication.
6	Completeness of Required Upgrades/Expenditure Elements	The capital expenditure forecasts and the operations and maintenance forecasts need to be complete. All projects and cost elements need to be included.
7	Accuracy of Cost Estimates	Cost estimates need to be as accurate as the data and present knowledge allows, consistently prepared and decisions made about timing of implementation, drivers for the project and level of accuracy the estimate is prepared to.
8	Correctness of Spreadsheet Templates	The templates prepared for use need to be correct and fit for purpose.
9	Assumptions and Uncertainties	Assumptions and uncertainties need to be explicitly stated on the estimates.
10	Changes Made After Submission to Financial Model	If Council makes decisions on expenditure after they have been submitted into the financial model, the implications of the decisions must be reflected in the financial information and other relevant places in the AMP – eg. Levels of service and performance measures, improvement plans etc.
11	Improvement Plan Adequate	Improvements identified, costed, planned and financially provided for in financial forecasts.

Z.5 Quality Assurance

	Issues and Requirements	Quality Assurance Approach	Responsible Person
1	Fitness for Purpose	Conduct various reviews of critical elements up front and plan to upgrade the plans to specific requirements: 1. Scoping of AMP Upgrade Project 2. Review of Levels of Service 3. Review of Document Upgrade Needs.	Becky Marsay
		Conduct a Peer Review.	Peter Thomson
2	AMP Document Consistency	Review documents in advance and prepare instructions to authors on how to upgrade.	Becky Marsay
3	AMP Document Format		
4	AMP Readability	Central review of AMP document deliverables.	Becky Marsay
5	AMP Text Accuracy and Currentness	Authors to review each AMP in detail.	David Light
6	Completeness of Required Upgrades/Expenditure Elements	AMP authors to workshop with relevant project team members to ensure all projects/cost elements covered.	David Light
		Central list of issues (called a "Parking Lot") that need to be considered in each AMP.	David Light
7	Accuracy of Cost Estimates	Independent review of all cost estimates.	James Tomkinson
8	Correctness of Spreadsheet Templates	Independent review of all templates.	Becky Marsay
9	Assumptions and Uncertainties and Risk Assessments	Independent review of all cost estimates.	James Tomkinson
10	Changes Made After Submission to Financial Model	Protocol prepared to ensure Teamsite is used and all parties follow instructions on how changes are made.	Becky Marsay
		Ensure there is a place in the AMP documents to record any changes made and the implications of changes.	Becky Marsay
		AMP authors to manage a change log for changes after submission.	David Light
11	Improvement Plan Adequate	Prepare template in advance to ensure consistent approach.	Becky Marsay
		Central review of Improvement Plans.	Becky Marsay

Z.6 Quality Control

Quality control checks and reviews are scheduled on the attached table. These shall be progressively completed as the AMP is developed and incorporated in the final AMP Plan in Appendix Z.

Check or Review	Person Responsible	Authority	Signature	Date
Scope of AMP Upgrade Project complete	Peter Thomson	Engineering Manager		
Levels of Service prepared to instructions	Becky Marsay	Project Technical Lead		15 Feb 2012
Levels of Service Asset Manager acceptance	Jeff Cuthbertson	Asset Manager		
AMP document prepared to instructions	Becky Marsay	Project Technical Lead		15 Feb 2012
AMP text accuracy and currentness	David Light	AMP Author		
Capital Upgrade List complete	Dugall Wilson	Programme Manager		
Capital Upgrade List complete - Asset Manager acceptance	Jeff Cuthbertson	Asset Manager		
All issues on “Parking Lot” addressed	David Light	AMP Author		
Capex Expenditure spreadsheet template reviewed	Becky Marsay	Project Technical Lead		15 Feb 2012
Project Estimate spreadsheet template reviewed	Dugall Wilson	Programme Manager		
All Capex Estimates reviewed and including assessment of Programme, Project Drivers, Levels of Accuracy and assumptions/uncertainty	David Light	AMP Author		
Opex Costs spreadsheet arithmetic review	David Light	AMP Author		
Opex Cost forecast – fitness for purpose	Jeff Cuthbertson	Asset Manager		
Improvement Plan prepared to instructions	Becky Marsay	Project Technical Lead		15 Feb 2012
Improvement Plan Asset Manager acceptance	Jeff Cuthbertson	Asset Manager		
Capital Forecast accepted for input to NCS	Jeff Cuthbertson	Asset Manager		
Change log complete and changes appropriately dealt with – after Council review	David Light	AMP Author		
Change log complete and changes appropriately dealt with – after Public consultation	Jeff Cuthbertson	Asset Manager		
Peer Review completed	Peter Thomson	Engineering Manager		