APPENDICES

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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 stormwater network.

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 stormwater drainage to urban areas 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 the stormwater services within the urban areas.

The Council has no statutory obligation to provide for private stormwater runoff, just as it has no obligation to provide protection against wind or other natural events. This is clear in the Local Government Act (LGA) 2002 where it states that councils do not have to take responsibility for stormwater systems which service only private properties.

However, Council does have a duty of care to ensure that any runoff from its own properties is remedied or mitigated. Because most of its property is mainly in the form of impermeable roads in developed areas, this generally means that some level of reticulation system is constructed. The presence of this system then becomes the logical network for private stormwater disposal.

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 legislative drivers for improving Asset Management through the Local Government Act 2002, and drivers for improving stormwater quality through the Resource Management Act (RMA) 1991
- **Regional and Local Drivers** – for example the Community Outcomes determined through consultation with the public
- **Industry Guidelines and Standards**
- **Linkages** – the need to ensure this AMP is consistent with all other relevant plans and policies
- **Constraints** – the legal constraints and obligations Council has to comply with in undertaking this activity

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

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

A.2.1. Acts of Parliament

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.

- Building Act 2004
- Civil Emergency Management Act 2002
- Climate Change Response Act 2002
- Construction Contracts Act 2002

- Fencing Act 1978
- Hazardous Substances and New Organisms Act 1996
- Health Act 1956
- Health and Safety in Employment Act 1992
- Litter Act 1979
- Land Drainage Act 1908
- Land Transfer Act 1952
- Local Government Act 1974
- Local Government Act 2002
- Local Government (Rating) Act 2002
- Public Bodies Contracts Act 1959
- Public Works Act 1981
- Resource Management Act 1991
- Rivers Board Act 1908
- Soil Conservation and Rivers Control Act 1941
- Utilities Access Act 2010
- Waste Minimisation Act 2008.

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

A number of these key legislative drivers have been summarised in more detail below.

A.2.1.1 Local Government Act

Part 7 and Section 285 of the Local Government Act 2002 required every local authority to complete an approved Water and Sanitary Services Assessments (WSSA) of all stormwater drainage in its district before 30 June 2005 (refer to Appendix C).

The Local Government Act empowers district councils to provide public drains. It also empowers Council to cleanse, repair and maintain their drainage infrastructure as necessary for effective drainage. Council also has powers under the Land Drainage Act (1908), Rivers Boards Act (1908), and Soil Conservation and Rivers Control Act (1941). The Asset Management Department takes on the service provider roles enabled through these Acts.

Note these statutes empower, but do not require, Council to provide drainage works. However, once Council does provide or take over control of systems, which enable and protect developments, there is an on-going duty to continue this protection.

A.2.1.2 Resource Management Act

In relation to stormwater, the Resource Management Act (RMA) 1991 deals with:

- the control of the use of land for the purpose of the maintenance and enhancement of the quality of water in water bodies and coastal water
- discharges of contaminants into water and discharges of water into water
- the control of the taking, use, damming and diversion of water, including:
    - the setting of any maximum or minimum levels or flows of water
    - -the control of the range, or rate of change, of levels or flows of water.

The RMA requires Council to sustain the potential of natural and physical resources to meet the reasonable foreseeable needs of future generations.

The Environment and Planning Department are responsible for the regulatory functions of Regional Council to control the use, development and protection of land, discharges etc., and do this through provisions and rules in the Regional Plan.

The Asset Management Department is responsible for complying with those rules in the management of public stormwater systems.

The RMA also requires Council to take into account the principles of the Treaty of Waitangi.

A.2.1.3 Building Act

This Act requires that buildings and site works are constructed to protect people and other property from the adverse effects of surface water. The Environment and Planning Department of Council are responsible for the enforcement of the Building Code which is enabled through the Building Act.

The ***Building Code*** requires that:

- urban runoff from a Q_{10} rain event is disposed of in such a way as to avoid likelihood of damage or nuisance to other property
- surface water from a Q_{50} event does not enter buildings
- secondary flow paths are taken into account.

A.2.2. National Policies, Regulations and Strategies

In addition to the legislation provided above, the Ministry for the Environment has also released the following documents:

- The National Environmental Standard for Sources of Human Drinking Water - intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater by requiring regional councils to consider the effects of activities on drinking water sources in their decision making.

A.2.3. Regional and Local Policies, Regulations and Strategies

Council also has several planning policy and/or management documents detailing its responsibilities under the legislative drivers listed above. Those which impact on the provision of Council's stormwater activity are:

- 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's Long-Term Plan/Annual Plans/Annual Reports
- Stormwater Activity Management Plan (previous versions)
- Tasman District Council Engineering Standards and Policies 2008 http://www.tasman.govt.nz
- Council's Procurement Strategy
- Project Stormwater
- Tasman-Nelson Regional Pest Management Strategy 2007-2012
- Riparian Land Management Strategy 2001
- Waimea Inlet Management Strategy 2010
- Any existing established strategies and policies of the Council (outside those contained in this Activity Management Plan itself) regarding this activity.

Studies and plans relating to specific sites are listed as Strategic Studies in the relevant section of Appendix B. Proposed new Strategic Studies are detailed in Appendix E.

These documents are reviewed in accordance with legislative timeframes.

A number of these key documents have been summarised in more detail below:

A.2.3.1 Relevant Variations to the TRMP

- *Variations 49 and 50 - Richmond South Development Area and Sustainable Urban Development Provisions*. Covers planning map amendments, Richmond South Development Area Design Guide, Schedule of amendments to the TRMP.

- *Variation 56 - Stormwater (Notified July 2007).* Proposals to amend provisions in Proposed Tasman Resource Management Plan, which encourages stormwater management within land use and subdivision activities and introduces the concept of low impact stormwater design (LID) for the effective management of stormwater.
- *Variation 61 and 62 - Richmond West Development Area.* Planning map amendments.
- *Variation 63 - Richmond West Development Area.* Sustainable urban development provisions.
- *Richmond West Proposal Regarding Design of Borck Creek:* Agreement between Council and landowners regarding the design of the Borck Creek Channel.

A.2.3.2 Project Stormwater

Project Stormwater is focused on improving Council's management of stormwater to achieve better stormwater values, including quality, quantity and ecological aspects. It covers many departments, affects multiple council processes and represents a fundamental change to Council philosophy regarding stormwater and associated land and activity management.

The scope of the project has progressively widened to encompass a low impact philosophy and to include various aspects of land and activity management – eg. subdivision development, that impact either directly or indirectly on stormwater values. Initial work undertaken has focused primarily on urban stormwater management and in particular those areas where Council has direct management responsibilities.

The key goals/objectives of Project Stormwater are:

- Council wide adoption of a low impact, multi-value philosophy towards stormwater management and associated land/activity management.
- Reflection of the low impact, multi-value philosophy in all council documents, processes and activities associated with stormwater.
- Obtaining relevant consents for all Council managed stormwater outfalls and discharges.
- Identifying and initiating improved Council stormwater management practices within each Urban Drainage Area (UDA) starting with Richmond.
- A programme of enhancement projects to improve stormwater values within natural, modified and reticulated stormwater systems within the UDAs.
- Better information on stormwater assets within UDAs including existing and potential stormwater values and GIS data.
- Improved management of stormwater assets including better integration of Engineering and Parks and Reserves responsibilities and outcomes, including lifecycle management of LID devices, eg. rain gardens and naturalised streams (as assets).
- An increasing voluntary uptake of low impact approaches and successful design and implementation of these developments amongst local developers.
- Consistent consideration by all parties of stormwater projects within a catchment context, including both upstream and downstream, as well as temporal issues.
- An improvement in the riparian biodiversity and functioning within the region, starting within the UDAs.
- An increased awareness amongst residents and businesses, both urban and rural of stormwater values, issues, solutions and opportunities for improvement.

A.2.4. Industry Guidelines/ Standards

The following Guidelines and Standards apply to this Activity:

- AS/NZS 2032:2006 Installation of PVC Pipe Systems
- AS/NZS 2280:2004 Ductile Iron Pressure Pipes and Fittings
- AS/NZS 3725:2007 Design for Installation of Buried Concrete Pipes
- AS/NZS 2566.1:1998 Buried Flexible Pipe Design

- AS/NZS 2566.2:2002 Buried Flexible Pipe Installation
- NZS 3101.1&2:2006 Concrete Structures Standard
- NZS 3910:2003 Conditions of Contract for Building and Civil Engineering Construction
- NZS 4404:2010 Land Development and Subdivision Infrastructure
- SNZ HB 4360:2000 Risk Management for Local Government
- NZWWA New Zealand Infrastructure Asset Grading Guidelines 1999
- NAMS International Infrastructure Management Manual 2006
- NZ Pipe Inspection Manual 2006
- Rawlinsons NZ Construction Handbook.

A.3 Links with Other Documents

This Activity Management Plan 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 following depicts the links between Council's asset management plans to other corporate plans and documents.

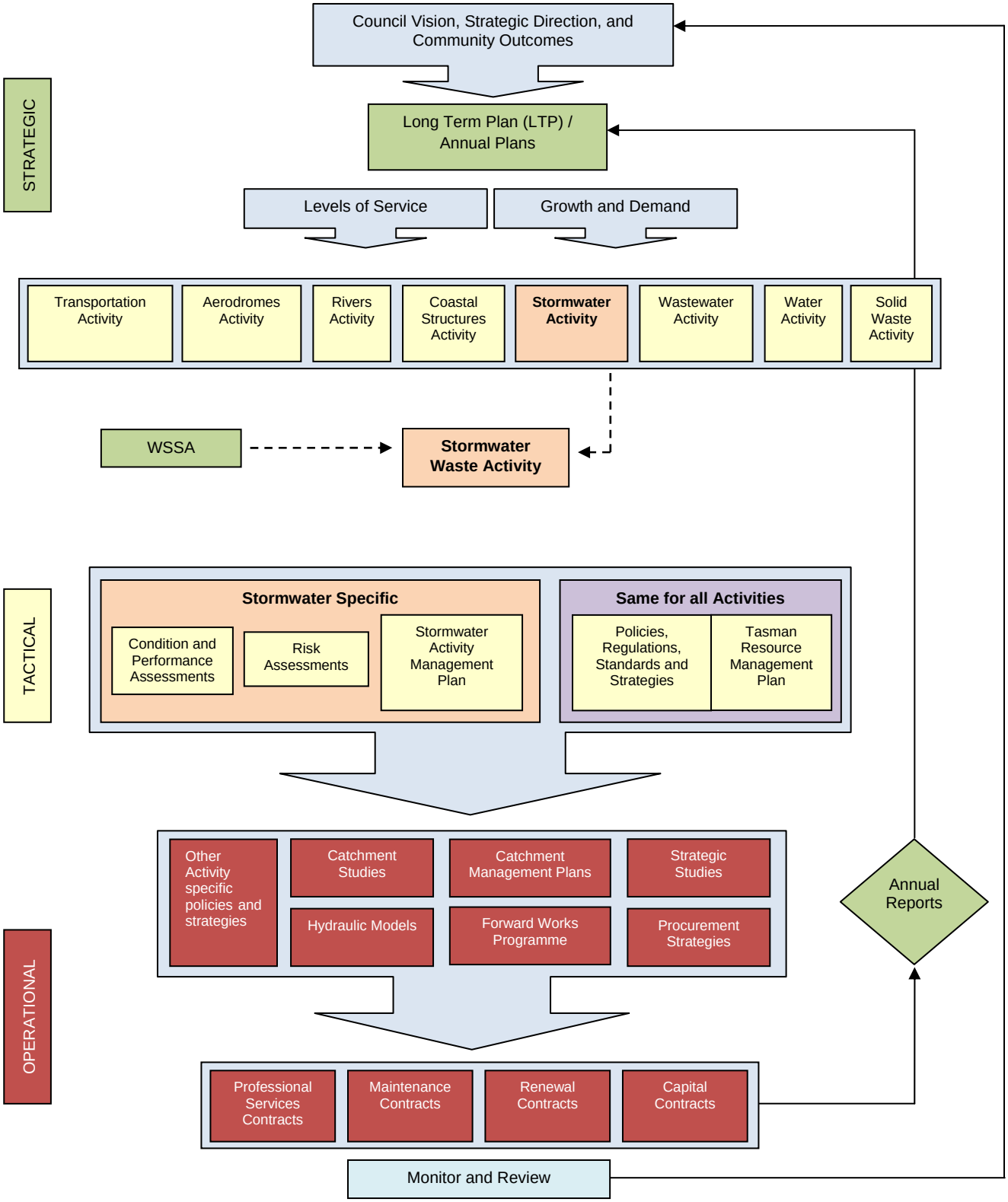


Figure A-1: Hierarchy of Council Policy, Strategy and Planning

Table A-1 describes the strategic documents used during the planning process.

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

Long Term Plan (LTP)	The Long-Term Plan. 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 Activity Management Plan (AMP) is the tactical plan with a view to achieving the strategic targets.
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.
Activity Management Plan (AMP)	The Activity Management Plans provide the framework to recognise and deliver future Levels of Service, Operation of Spend and Capital Programmes in a way which is consistent, transparent and integrated with Council's day to day business.
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, asset data etc.). Council's goal is to work towards such a fully integrated system.

A.4 Strategic Direction

Council's 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. He rohi Whakaarotahie. Noho ora ana I runga I te Whenua ataahua. Ko te rohe o Tahimana"

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 sustainably 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.

A.4.1. Our Goal for the Stormwater Activity

Council aims to achieve an acceptable level of flood protection in each UDA and the remaining general district stormwater areas.

APPENDIX B OVERVIEW OF COUNCIL OWNED STORMWATER NETWORKS IN THE DISTRICT

Plans illustrating the extent of Council's stormwater system in each Urban Drainage Area (UDA) are enclosed in Appendix Y, Stormwater UDA Boundaries.

There are 15 stormwater UDAs within the Tasman district.

B1 Richmond UDA

B2 Brightwater UDA

B3 Wakefield UDA

B4 Murchison UDA

B5 St Arnaud UDA

B6 Tapawera UDA

B7 Motueka UDA

B8 Mapua / Ruby Bay UDA

B9 Tasman UDA

B10 Kaiteriteri UDA

B11 Takaka UDA

B12 Pohara UDA

B13 Ligar Bay / Tata Beach UDA

B14 Collingwood UDA

B15 Patons Rock UDA

B16 Non-Urban Areas

B.1 Richmond UDA

B.1.1. System Overview

The Richmond UDA is the most developed and densely populated UDA in the Tasman district. Much of the stormwater flows originate from the Richmond foothills, which slope away from the developed areas towards an elevation of approximately 600m. Much of the foothills area is forested but is subject to periodic harvesting. There are a number of gullies which route through stormwater flows into a number of places within the urban area.

The UDA has three distinct drainage catchments:

1. South Richmond and Borck Creek
2. Jimmy Lee Creek (CBD)
3. Reservoir Creek.

The stormwater systems outside the built up developed areas are predominantly open channels/private drains with culvert crossings under roads and other services.

In some places, detention dams have been constructed to 'control' stormwater flows in strategic places to reduce peak flows and the severity/likelihood of flooding risk further downstream. In Richmond, there are seven such structures:

- Olympus Way Detention Pond
- Cemetery Dam Detention Pond
- Blair Terrace Detention Pond
- Washbourn Gardens Detention Pond
- Bill Wilkes Reserve Detention Pond
- Lodestone Road Detention Pond
- Reservoir Creek Detention Pond.

Since these control peak flows reaching the lower parts of the catchments, the maintenance of the inlets and outlets of these structures is a high priority.

Much of the stormwater system within the developed area is piped. The major piped stormwater systems convey stormwater along Oxford Street, Queen Street, Salisbury Road and Gladstone Road. These link up and intercept and convey stormwater from major open drain systems originating from Reservoir Creek, Jimmy Lee Creek and the Hart Drain.

Much of the stormwater flows in a northerly direction from its source of origin into the CBD area. In many places the existing piped stormwater system is under capacity, a problem, which has been compounded as a result of the continuous development of Richmond originating from the CBD outwards towards the foothills.

Eight sub catchments were identified during the construction of the Richmond Stormwater Model in 2007[1]:

- Reservoir Creek sub-catchment
- Churchills sub-catchment
- Williams sub-catchment
- Lower Richmond sub-catchment
- Jimmy Lee Creek sub-catchment
- Upper Richmond sub-catchment
- Poutama sub-catchment
- Borck Creek and Eastern Hills catchments

[1] Richmond Stormwater Analysis Model Build and System Performance Analysis (MWH, August 2007)

Within these eight sub catchments, there are three distinct stormwater discharges into Tasman Bay:

- Borck Creek (draining flows from the Eastern Hills, Reed Andrews and Borck Creek)
- Jimmy Lee Creek (draining into Beach Road Drain)
- Reservoir Creek.

There is currently a coarse debris screen on the outlet into Jimmy Lee Creek (Beach Road Drain). This is a pilot study to investigate the benefits of coarse screening treatment for the receiving environment. There is no other treatment in place.

Table B-3 shows the stormwater assets in Richmond.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Richmond currently has the following resource consents.

- RM080291: Proposed works involve provision of a new open stormwater drain (Poutama Drain) between Railway Reserve (north-west of Poutama Street) and Borck Creek (Poutama Drain) (expires 28 September 2029).
- RM100059: To dam and detain floodwater water in Jimmy Lee Creek (expires 31 May 2030).
- RM100060: Use of the riverbed by a dam in Jimmy Lee Creek (expires 31 May 2030).
- RM090901: To dam and detain floodwater water (expires 31 May 2030).
- RM090902: Use of the riverbed by a dam (expires 31 May 2030).
- RM100465: Land Use (Riverbed) Consent - To alter a dam and use of the riverbed (1 September 2045).
- RM100061: To dam and detain floodwater water (Lodestone Road) (expires 30 May 2030).
- RM100062: Use of the riverbed by a dam (Lodestone Road) (expires 30 May 2030).
- RM100662: To install a temporary debris screen on the Jimmy Lee Creek (Beach Road) culvert (expires 21 October 2045).
- RM100465: Land Use (Riverbed) Consent - To alter a dam and use of the riverbed (expires 1 September 2045).
- RM100466: Reservoir Creek - to alter and maintain a dam in an earthquake zone and a land disturbance and slope stability risk area (expires 1 September 2045).
- RM0110111 to dam and detain floodwater (Eden Dam) on unnamed tributary to 88 Valley Stream (expires 31 May 2031).
- RM0110112 to use of riverbed for dam on unnamed tributary to 88 Valley Stream (expires 31 May 2031).

The characteristic of each sub catchment is described in more detail below. Refer to the Richmond Stormwater Analysis Report 2007 for catchment maps.

B.1.1.1 Reservoir Creek Sub-catchment

Reservoir Creek drains the Richmond foothills located on the south eastern side of Richmond and measures about 224ha. The upper reaches are in the Barnicoat Range and are steep and partly forested. Most of the drainage network is in the form of open drains. Immediately above Hill Street the area is zoned rural residential and between Hill Street and Salisbury Road is residential. Below Salisbury Road the stream collects runoff from a small area of rural land before discharging to the Tasman Bay.

A reservoir, previously used for water supply for Richmond, is located in the upper reaches of Reservoir Creek.

B.1.1.2 Churchills Sub-catchment

The Churchills sub-catchment, which measures about 94ha, is located to the west of Upper Reservoir Creek sub-catchment. The drainage system comprises open drains in the upper undeveloped reaches and comprises pipe sections in the urbanised middle and lower reaches of the catchment.

A detention dam is located on Churchills drain immediately above Cresswell Place, south of Hill Street.

B.1.1.3 Williams Sub-catchment

Williams is a small urban sub-catchment located essentially between Hill Street and Salisbury Road, and east of Queen Street. This catchment measures about 58ha and the drainage network comprises pipe network. The catchment gradient is flat and land use comprises medium density housing and two schools.

B.1.1.4 Lower Richmond Sub-catchment

The Lower Richmond catchment lies between Queen Street, Salisbury Road and the Richmond Deviation, and is predominantly residential with a small amount of commercial development toward Queen Street. The catchment measures about 81ha and the drainage network comprises extensively developed pipe network.

B.1.1.5 Jimmy Lee Creek Sub-catchment

The Jimmy Lee Creek catchment drains the steep valleys of Richmond Hill on the Barnicoat Range upstream of Hill Street as well as an urban area between Hill Street and Salisbury Road to the west of Queen Street. The drainage network comprises of a system of piped sections which discharge into the main drain which is in the form of an open drain. The two main tributaries pass through residential zoned land and combine at the detention pond in the Bill Wilkes Reserve. From there the channel passes through Washbourn Gardens (which acts as a second detention pond) and into the Queen Street reticulation.

B.1.1.6 Upper Richmond Sub-catchment

The Upper Richmond catchment measures about 220ha and contains the Queen Street stormwater system. This system drains the residential areas west of Queen Street from about Hill Street including the commercial shopping centre and the area down to the Gladstone Road/Beach Road trunk main. The stormwater is collected and conveyed through an extensive network of stormwater pipes.

Stormwater from Jimmy Lee Creek enters the Queen Street catchment at Oxford Street in the vicinity of Washbourn Gardens and is conveyed in the stormwater pipe network to the Gladstone Road/Beach Road trunk main.

B.1.1.7 Poutama Sub-catchment

The Poutama catchment measures about 184ha and is mainly semi-rural to rural land use located adjacent to the urban Richmond area. The Poutama catchment is more rural in nature, and is comparable with catchments surrounding Borck Creek. The lower part of Poutama catchment is zoned as residential.

The Poutama catchment drains the steep slopes of the Barnicoat Range down to Hill Street and from there it drains the relatively flat areas to discharge into the upstream end of the trunk main along Gladstone Road.

B.1.1.8 Borck Creek and Eastern Hills Sub-catchments

The Borck Creek system drains a total catchment area of 1440ha located west of urban Richmond, and comprises of 800ha of hill country, 410ha of intermediate terraces and 230ha of floodplain. The catchment area includes the Poutama sub-catchment. The catchment drainage system rises at the watershed of the Barnicoat Range, west of Richmond. The topography falls steeply to the flat Waimea Plains located northwest of Haycocks Road/ Hill Street. In the hills the waterways follow the natural topography. Borck Creek discharges into Waimea Inlet and the lower 500m of Borck Creek is impacted by tidal effects.

Borck Creek and its major tributaries, including Eastern Hills Drain (also called Bateup Drain) and Whites Drain, were excavated through swamp lands in west Richmond in the 1970s by the Nelson Catchment Board. The drains divert floodwater away from the Gladstone Road system and the main town area to ultimately discharge into the Waimea Inlet in the vicinity of Headingly Road.

Under natural, pre-settlement conditions, floods in Borck Creek would probably have spread out over the floodplain. After settlement for farming, the first development of the creek would have been to realign the natural channels as agricultural drains. Indications are that the design capacity of the original agricultural drains was small and therefore flood flows would still have spread out over the floodplain. Later, with more development on the floodplain, some reaches of Borck Creek have been improved to have adequate capacity to handle the design flood flow, but other reaches still have grossly inadequate capacity.

Relatively recently, parts of Borck Creek have been upgraded to provide improved level of service in terms of handling flooding events. Some of these improvements have been designed to give flood protection to a one in 50 year return period level of service.

Other channel improvements have been implemented to a lesser standard. Designs have been proposed in previous studies to upgrade more of the lower parts of the waterway to the 1 in 50 year level of service.

The waterway system has multiple culvert and bridge crossings of the road network and of private roads or driveways. The major crossings are in Queen Street, State Highway 6 (SH6) or Main Road Hope (three crossings), State Highway 60 (SH60), and Ranzau Road. There are a number of smaller crossings of significance in Ranzau Road and Patons Road.

B.1.2. Asset Capacity and Performance

B.1.2.1 Primary Flow Paths

The Richmond Stormwater Analysis Report 2007 identified six areas that were under capacity, ie. existing capacity was less than the required 1 in 5 year flood event. Borck Creek was also found to be under capacity, ie. existing capacity was less than the required 1 in 50 year flood event.

B.1.2.1.1 Reservoir Creek Sub-catchment

Hydraulic analysis shows that under present and anticipated future land use conditions, the pipe network capacity generally exceeds the 5-year flood flow capacity, except along Selbourne Avenue, south of Hill Street, a short section along Ridings Grove, south of Hill Street, near Templemore Drive, between Hill Street and Salisbury Road, and at the corner of Champion Road and Salisbury Road.

B.1.2.1.2 Churchills Sub-catchment

Hydraulic analysis shows that much of this pipe network has insufficient capacity to convey the 5-year flood event, particularly under future land use conditions.

B.1.2.1.3 Williams Sub-catchment

Hydraulic analysis shows that most of this pipe network has insufficient capacity to convey the 5-year flood event, particularly under future land use conditions.

B.1.2.1.4 Lower Richmond Sub-catchment

Under present land use conditions, much of the pipe network can handle the 5-year flood peak. Pipes in the area around McPherson Street are however under sized and flooding occurs in this area (see Figure 5.1). Under future land use conditions, significant flooding can be expected particularly in the areas around Croucher Street, Birds Street and Doran Street.

B.1.2.1.5 Jimmy Lee Sub-catchment

The Washbourn Gardens detention dam overflowed during the June 2003 flood event. Hydraulic analysis has confirmed this situation and the analysis has shown that the pipe network upstream of Hill Street and in the vicinity of Kihilla Road, Washbourn Drive and Farnham Drive cannot handle the 5-year flow. Several of the pipe reaches however have a capacity better than 10-year flood flow.

B.1.2.1.6 Upper Richmond (including Queen Street) Sub-catchment

This catchment also has a detention pond located at Olympus Way, but has a relatively small capacity. The inflow peak flow is about 1.2m^3/sec and the estimated outflow peak is about 0.8m^3/sec. The efficacy of the detention pond is therefore minor in view of its relatively small capacity.

B.1.2.1.7 Poutama Sub-catchment

Hydraulic analysis showed that the network is adequate to handle the 5-year storm runoff under present land use conditions. Most parts of the network also have adequate capacity to handle at least the 5-year storm runoff under possible future land use conditions.

B.1.2.2 Borck Creek and Eastern Hills Sub-catchments

The predicted peak flows in various key sections along Borck Creek and its tributaries are shown in

Table B-1. These are compared to the assessed channel capacities and constrictions imposed by bridges and culverts.

Table B-1: Design Flows and Channel Capacities of Borck Creek

Reach	Location Description (from downstream to upstream)	Peak Flow Predictions at various Return Periods (m^3/s)				Channel Capacity (m^3/s)
		1 in 5	1 in 10	1 in 20	1 in 50	
1	Borck Creek to Queen Street	19	22	28	34	12
2-4	Borck Creek from Queen Street to gauge site	18	21	28	34	17
5	Borck Creek from gauge site to Reed Andrews Drain	10	14	18	22	21
12	Eastern Hills Drain (also known as Bateup Drain)	4	5	6	8	14
11	Reed Andrews Drain (also known as Whites Drain)	1.9	2.8	3.5	5	7
6-7	Borck Creek from Reed Andrews Drain to SH6	8	10	13	18	13
9	Borck Creek from SH6 to Ranzau Road	7.4	10.9	10.7	13	13
10	From Patons Road along north side of Ranzau Road	0.6	0.7	0.7	0.8	0.5
10	From Patons Road along south side of Ranzau Road	1.8	2.1	2.4	2.8	2
	Borck Creek from Ranzau Road to Aniseed Valley Road.	3.2	4.1	4.6	6	3

Source: Richmond Stormwater Analysis Model Build and System Performance Analysis (MWH New Zealand Ltd (MWH), August 2007)

Borck Creek is required to handle at least the 50-year flood event. Much of Borck Creek is under capacity and flooding extending onto the floodplain occurs regularly with widespread ponding. Critical areas include:

- essentially the full length of Borck Creek
- lower reaches of Whites Drain
- lower reaches of Eastern Hills Drain (Bateup Drain).

Refer to the Richmond Stormwater Analysis Report 2007 for detailed analysis of each area along Borck Creek. Stormwater planning and capital works have been programmed to address these capacity issues.

B.1.2.3 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.1.2.4 Performance

Confirm has Customer Service Request (CSD) records of the following issues from the period 2008 to 2011

Row Labels	Flooding	Health Nuisance	Manhole Cover Missing	New Stormwater Connection	Open Drains (non roading)	Other	Pipe Break/ Blockage	Grand Total
Richmond	35	2	17	5	21	54	21	155

Source: Confirm

Other performance issues for Richmond UDA are.

- Significant development is planned around the central dense residential developed area, with potential to further increase stormwater flows through the piped and open channel stormwater systems. Many piped systems in the central area were originally designed to accommodate flows from the immediate central areas. However, with recent, significant developments in many areas, many parts of the system do not provide a satisfactory level of service.
- The natural pathway for stormwater flows is in a northerly direction, against many of the main infrastructure routes and road layout on a north west to south east grid. As development takes place this is leading to an increase in peak stormwater flows which naturally pass into the more densely populated areas.
- Significant development (residential, commercial and light industrial) took place around a number of key open drains such as the Reed/Andrews and the Eastern Hills Drains and now provides a constraint against drain widening.
- There are a number of significant areas of land allocated for future residential development to the north west of State Highway 6, within the Reed/ Andrews and Eastern Hills catchments and east of central Richmond, all which will increase future stormwater flow peak levels and volumes.
- The Reed/ Andrews Drain and Borck Creek have crossings under State Highway 6 and 60 (Appleby Highway) through box culverts, and proposals to increase the size of any culvert crossing will require the approval of NZ Transport Agency.
- The levels of service for existing stormwater systems are proposed to be capable of managing a 1 in 5 year flood event. The Richmond UDA has been measured at being 80% compliant with a target of 75% for Years 1 through 3 of the planning period.
- The Council's Engineering Standards require all new conventional pipe systems to have a 1 in 20 year capacity for the primary system, refer to table 7-2 of the Engineering Standards 2008 for further information on requirements of new infrastructure.

B.1.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1950 and 2008.

Generally the assets in the Richmond UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, the following asset renewals are planned for the period of this AMP.

- Lodestone Park - Replace existing inlet structure with new inlet structure for Lodestone Park temporary storage pond.
- Detention Dam Resource Consent Renewals - Consents expire 31 May 2030 (Bill Wilkes, Washbourn, Lodestone, Eden).
- Soak Hole Renewals - Strategy and renewals/upgrades in Richmond (across all UDAs). Soakage improvements on Whiting Drive/Lord Auckland (proj #57) now included in this scheme and to be highest priority.
- Richmond Renewals - CCTV shows areas in McGlashen, Doran, Waverley, Salisbury. Manhole to manhole renewal.

B.1.4. Compliance with Level of Service

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired levels of service.

A Catchment Management Plan is currently being developed to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan will be followed by a resource consent application for discharge in accordance with the TRMP.

B.1.5. Growth and Demand

Growth from new dwellings in Richmond township is expected to increase by 29% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.1.6. Operations and Maintenance

The primary operating and maintenance activity for Richmond is to ensure the open drainage channels are kept to a reasonable standard of repair. There have been some problems with the state of the drains in recent years so the Council, in association with the operations and maintenance contractor developed an appropriate regime of works.

The inlet and outlet structures of all the detention dams are maintained so that these remain fully functional.

Details of the operation and maintenance regime are included in Appendix E.

B.1.7. Strategic Studies

Table B-2 below lists key existing strategic studies and models within the UDA:

Table B-2: Existing Strategic Studies and Models for the Richmond UDA

Title	Month	Year	Author	Purpose
Flood Hazard at the Wairoa Bridge, Nelson	January	1986	E. Verstappen	Records observations of 1986 flood event that affected Richmond and Brightwater.
Eastern Hills Drain Study	May	1995	Sanders, Lane and Page Ltd	Catchment assessment of Borck Creek and Eastern Hills Drain.
Borck Creek Improvement Strategy	March	2000	MWH	Objective of strategy is to determine the most cost effective and affordable improvements necessary to discharge the 1 in 50 year flood without flooding buildings.
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.

Title	Month	Year	Author	Purpose
Richmond Urban Drainage Area Development Impact Levy for Stormwater	April	2004	MWH	Investigates proportion of upgrade costs due to growth in Richmond, development contributions.
South Richmond Development Area Study	January	2006	MWH	Review of existing system and recommendations to provide a satisfactory level of service.
Borck Creek Upgrade, Creek Mouth to Ranzau Road	January	2006	MWH	Reviews extent of existing development in Borck Creek catchment and determines the 50 and 100 year storm events.
Richmond and Motueka Design Rainfall	March	2007	Opus	Review and upgrade of design rainfall tables.
Richmond Stormwater Analysis Model Build and System Performance Analysis	August	2007	MWH	Describes appropriate hydrologic and hydraulic models including data collection, calibration and verification and analysis of existing drainage network under present and anticipated future land use conditions.
Richmond Stormwater Modelling Options Analysis	June	2008	MWH	Area wide assessment of Richmond system capacity and performance.
Richmond Detention Dam Modelling Assessment	November	2009	MWH	Improve the way existing detention basins are modelled in the Richmond UDA
Dam Safety Inspections for Detention Dams	November	2009	MWH	Safety inspection and assessment of Bill Wilkes Reserve, Washbourn Gardens, Lodestone Road-Dellside Reserve for retrospective resource consent application.
Future Proofing Richmond's Stormwater Infrastructure		2010	MWH	Presentation to Stormwater Conference 2010 - Denis O'Brien and Jeff Cuthbertson.

B.1.8. Key Issues

The key issues for Richmond are:

- some assets are nearing the end of their design life or are in poor condition and need to be replaced
- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.1.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-3: Richmond Stormwater Assets

Richmond Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	102
SW-Culvert	1,375
SW-Extent of feature	428
SW-Pipe	94,160
Grand Total	**96,065**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	**102**
0	102
SW-Culvert	**1,375**
0	852
300	107
375	48
450	78
600	12
900	54
1050	71
1200	18
1500	36
1800	100
SW-Extent of feature	**428**
0	428
SW-Pipe	**94,160**
0	46
40	22
90	80
100	5,814
110	9
150	7,300
160	34
200	712
225	16,453
250	764
300	19,757
375	7,708
450	10,684
525	3,389
600	5,852
675	1,028
700	2
750	3,420
825	402
900	3,906
1050	2,157
1200	3,286
1220	172
1350	98
1400	165
1500	609
1600	41
1650	123
1800	127
Grand Total	**96,065**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	**102**
Concrete	102
SW-Culvert	**1,375**
Concrete	963
Field Tile	43
RCFJ	119
RCRRJ	122
RCRRJ Class Z	66
Unknown	62
SW-Extent of feature	**428**
Concrete	58
(blank)	370
SW-Pipe	**94,160**
Alufio Aluminium Corrugated	167
Asbestos Cement	391
Cast Iron	2
Concrete	35,947
Glazed Earthenware	94
Novaflow	80
PVC	3,004
PVC Class B	29
RCFJ	1,672
RCFJ Class X	1,559
RCRRJ	29,831
RCRRJ Class X	7,464
RCRRJ Class Y	2,157
RCRRJ Class Z	406
Steel	171
Unknown	3,641
uPVC	7,543
Grand Total	**96,065**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	22,902
Grand Total	**22,902**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Count of ASSETID
SW-Chamber	39
SW-Cleaning eye	65
SW-Detention dam	4
SW-Inlet	39
SW-Inlet structure	40
SW-Inspection point	33
SW-Manhole	1,040
SW-Miscellaneous item	1
SW-Node	371
SW-Outlet	99
SW-Outlet structure	32
SW-Pump	1
SW-Soakpit	21
SW-Sump	1,878
SW-Valve	3
Grand Total	**3,666**

B.2 Brightwater UDA

B.2.1. System Overview

The Brightwater settlement is positioned between the Wai-iti and Wairoa Rivers, three kilometres upstream from their confluence. It is situated on a very flat floodplain with a number of old, shallow river and stream channels crossing it.

There are four catchments immediately above Brightwater; from east to west these are the Mt Heslington catchment (395ha), Rutherford catchment (13ha), Jeffries catchment (141ha), and the Pitfure catchment (2,500ha). Brightwater's urban stormwater network is positioned in the centre of these surrounding rivers and catchments and covers an area of about 70ha. Refer to Appendix Y for a map of the catchments and UDA boundary.

The streams originating from the Pitfure, Jeffries, and Rutherford catchments generally pass around the western side of Brightwater then up towards the Wai-iti River. The Mt Heslington Stream passes through the Brightwater School then turns eastward to join the Wairoa River via the Railway Diversion. The Wai-iti and Wairoa Rivers that flank Brightwater have their own associated flooding problems. The assessment of the flood hazard resulting from these rivers falls outside the scope of this investigation, which is primarily concerned with localised stormwater flooding.

The Mt Heslington Stream and Jeffries Creek arise from steep hillside catchments to the south. They both cross through parts of the Brightwater UDA. Mt Heslington Stream crosses through the southeast through the stockyards, under the deviation (SH6) across the primary school, under Ellis Street and into a diversion channel that takes stream away from its 'natural channel' direct to the Wairoa.

Jeffries Creek cuts across the far southwest end of the UDA around Lord Rutherford Road before draining into the Pitfure Stream. The Pitfure Stream is a long flat meandering stream that drains the floodplain between Wakefield and Brightwater. It passes to the west of Brightwater UDA.

The main urban areas of Brightwater discharge in piped systems either into one of the three streams or into the old river channels that lead into the Wairoa or Wai-iti Rivers.

Through observing the floods of 29 June 2003 (Tomkinson and Burridge, 2003), the stormwater flooding problems at Brightwater are believed to have been caused by runoff flows from a combination of the four catchments immediately above the township.

There is currently no stormwater treatment in place.

Table B-5 shows the stormwater assets in Brightwater.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Brightwater currently has no resource consents.

B.2.2. Asset Capacity and Performance

B.2.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.2.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.2.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Brightwater	5	3	8	4	20

Source: Confirm

Other performance issues for Brightwater UDA are.

- It is flat with very little hydraulic gradient to get good drainage.
- It has three streams fed by reasonably large rural catchments (outside the UDA) that run through or around the outskirts of the UDA.
- Flooding issues in southwest Brightwater are inter-related. The main issue is the relatively flat topography of the valley floor which is primarily a flood plain for the Wai-iti River and is naturally graded towards the urban areas of south west Brightwater, which combined with the lack of existing drainage capacity leads to widespread overland flow and flooding.

B.2.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1964 and 2008. A small stormwater pumping station was installed in the Brightwater Underpass in 2004/05 to alleviate flooding.

Generally the assets in the Brightwater UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. However, the mechanical and electrical assets at the pumping station have been programmed for renewal in this planning period as they will reach the end of their expected design life.

B.2.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service has also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 30% of the network is not yet capable of containing a 1 in 5 year storm event. The flood event of 29 June 2003 provided recent knowledge.

Generally all of the streams are flood prone and experience frequent 'out-of-channel' flows. This causes problems where they come into or up against the UDA, specifically:

- Mt Heslington Stream – flooding experienced where stream passes through private property south of Ellis Street
- Pitfure Stream – the Pitfure Stream floods frequently and threatens the on-going subdivision development to the northwest. Subdivisions have been protected by the construction of low flood banks and property raising.

Jeffries Creek was upgraded to Q50 in 2009/10.
It is estimated that the existing system provides levels of service in the region of:

- Pitfure Stream - Q_{10} - 1 in 10 year return period
- Mt Heslington Stream - Q_2 - 1 in 2 year return period.

Generally the remainder of the stormwater system appears adequate, or has adequate secondary flow paths so as not to cause undue flooding when the system capacity is exceeded. The exceptions to this are:

- Rintoul Place which suffered extensive surface flooding when the primary drainage system capacity was exceeded in the 29 June 2003 event.
- Fairfield Street where a stormwater soak pit does not provide sufficient drainage in severe events.

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.2.5. Growth and Demand

Growth from new dwellings in Brightwater township is expected to increase by 45% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.2.6. Operations and Maintenance

The primary operating and maintenance activity for Brightwater is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operation and maintenance regime are included in Appendix E.

B.2.7. Strategic Studies

Table B-4 below lists key existing strategic studies and models within the UDA:

Table B-4: Existing Strategic Studies and Models for the Brightwater UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event.	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
South West Brightwater, Mt Heslington Stream Stormwater Concept Design.	January	2010	MWH	Investigates improvement works to prevent flooding in Brightwater in 1 in 20 year storm.

Table B-5: Brightwater Stormwater Assets

Brightwater Stormwater Assets
Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Culvert	31
SW-Extent of featur	263
SW-Pipe	10,400
Grand Total	**10,694**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Culvert	**31**
0	14
1200	17
SW-Extent of feature	**263**
0	263
SW-Pipe	**10,400**
40	7
100	1,191
150	515
160	37
200	87
225	1,392
240	1
250	1
300	2,393
375	1,094
450	1,454
500	10
525	295
600	1,304
750	551
900	31
1200	38
Grand Total	**10,694**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Culvert	**31**
Concrete	31
SW-Extent of feature	**263**
(blank)	263
SW-Pipe	**10,400**
Aluflo Aluminium Corrugated	245
Concrete	3,040
Corrugated steel	202
MDPE	7
Novaflow	120
Polyethylene	7
PVC	232
RCFJ	150
RCRRJ	3,945
RCRRJ Class X	79
RCRRJ Class Z	73
Unknown	540
uPVC	1,761
Grand Total	**10,694**

Summary of Channel Assets

TDC Ownershi	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Channel	7,242
Grand Total	**7,242**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Count of ASSETID
SW-Cleaning eye	15
SW-Collection pon	3
SW-Control cabine	1
SW-Inlet	22
SW-Inlet structure	4
SW-Inspection poir	1
SW-Manhole	124
SW-Node	31
SW-Outlet	23
SW-Outlet structur	6
SW-Pump	1
SW-Pump station	1
SW-Soakpit	7
SW-Sump	157
SW-Telemetry	1
Grand Total	**397**

B.3 Wakefield UDA

B.3.1. System Overview

The Wakefield UDA is a mixture of rural and urban development. To the west of the State Highway the land is flat, and to the east it is undulating. Recent subdivision development has incorporated stormwater systems but these ultimately discharge to open drains which in the east discharge to the Pitfure Stream which flows from Wakefield to Brightwater before it joins the Wai-iti River. The southern area discharges to 88 Valley Stream and several areas lead directly to the Wai-iti River.

Wakefield lies between two waterways; the Wai-iti River and the Pitfure Stream. All the drainage systems in Wakefield eventually drain to one of these rivers. Most of the stormwater system was built during the late 1980s. Refer to Appendix Y for a map of the catchments and UDA boundary.

There is currently no stormwater treatment in place.

Table 6 shows the stormwater assets in Wakefield.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Wakefield currently has no resource consents.

B.3.2. Asset Capacity and Performance

B.3.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.3.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.3.2.3 Performance

There is little historical data available concerning the performance of either pipe systems and/or the open drains in this area, however it should be noted that there was serious flooding to the surrounding area from the Wai-iti River during the July 1983 floods in that area.

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Wakefield	4	3	3	1	11

Source: Confirm

Other performance issues for Wakefield UDA are.

- the settlement is located on a flood plain, close to the Wai-iti River to one side and to the Pitfure Stream on the other side (a tributary of the Wai-iti River)
- a formal review of the condition of the stormwater system and assessment of the current system performance and review to accommodate future population growth has not been completed but is recommended.

B.3.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1958 and 2008.

Generally the assets in the Wakefield UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, renewal is required due to poor condition of the existing stormwater pipe from SH6 and Pitfure Road intersection out to an open drain into Pitfure Stream.

B.3.4. Compliance with Level of Service

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used based on results of the catchment study) to determine that 40% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.3.5. Growth and Demand

Growth from new dwellings in Wakefield township is expected to increase by 37% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.3.6. Operations and Maintenance

The open drains are to be maintained to a level of service determined by the Asset Manager Stormwater, namely that the passage of stormwater through the open channels is achieved without causing either blockages or scouring of banks.

Details of the operation and maintenance regime are included in Appendix E.

B.3.7. Strategic Studies

There are no existing strategic studies and models within the UDA.

B.3.8. Key Issues

The key issues for Wakefield are.

- some assets are nearing the end of their design life or are in poor condition and need to be replaced
- 40% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.3.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-6: Wakefield Stormwater Assets

Wakefield Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Culvert	99
SW-Pipe	8,532
Grand Total	**8,631**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Culvert	**99**
0	8
375	91
SW-Pipe	**8,532**
100	472
150	133
160	71
200	162
225	692
300	3,203
375	516
450	1,549
525	233
600	734
650	38
675	79
750	540
900	109
Grand Total	**8,631**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Culvert	**99**
Concrete	8
RCRRJ	18
RCRRJ Class Z	72
SW-Pipe	**8,532**
Asbestos Cement	11
Concrete	129
Glazed Earthenware	56
Nexus Hi-way	71
PVC	13
RCRRJ	4,123
RCRRJ Class X	419
RCRRJ Class Y	85
RCRRJ Class Z	68
Unknown	2,617
uPVC	940
Grand Total	**8,631**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Channel	6,153
Grand Total	**6,153**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Count of ASSETID
SW-Cleaning eye	3
SW-Inlet	23
SW-Inlet structure	2
SW-Manhole	82
SW-Node	49
SW-Outlet	32
SW-Outlet structure	1
SW-Soakpit	12
SW-Sump	157
Grand Total	**361**

B.4 Murchison UDA

B.4.1. System Overview

The primary drainage system in Murchison is the network of open creeks that drain to the Matakitaki River just south of Murchison. These creeks drain over 600ha of predominantly rural catchment through Murchison, picking up the urban runoff as they pass through the town. The creek network is quite extensive throughout the town and the area of piped stormwater systems is restricted to drainage from Waller Street, the central part of town.

The catchment area has not been assessed, refer to Appendix Y for a map of the UDA boundary.

There are numerous culvert crossings under a number of streets as a result of the six open channels passing into the Murchison UDA.

Within the UDA, the majority of stormwater from residential dwellings is to ground soakage. From highways stormwater runoff is to open channels (Ned's Creek) or to soakaways.

The reticulated stormwater system comprises of a number of small piped systems that collect highway drainage, most discharging into Ned's Creek. Grey Street runoff drains into a series of soakaways.

The remainder of the Murchison area drains into a series of open ditches and waterways. The ditches are highly modified from their natural state (to improve drainage capacity) and the riparian areas are a variety of grassed, landscaped and bush verges depending on the land use and landowner preference.

There is currently no stormwater treatment in place.

Table 7 shows the stormwater assets in Murchison.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Murchison currently has no resource consents.

B.4.2. Asset Capacity and Performance

B.4.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.4.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.4.2.3 Performance

There is little data available but there have been recent problems with single sumps and pipes in Fairfax Street becoming blocked. New double sumps and larger pipes have been installed and this should resolve these problems. A new stormwater system in Milton Street discharges to Ned's Creek and maintenance work in that creek is done on an 'as and when' required basis. The performance of the deep sump manholes, which discharge into river gravels in Grey and Fairfax Streets, has been satisfactory.

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Open Drains (non-roading)	Other	Grand Total
Murchison	2	1	2	5

Source: Confirm

Other performance issues for Murchison UDA are.

- The network of stormwater ditches pass through the UDA in close proximity to a number of dwellings and access is very restricted in places where ditches pass through various subdivisions.
- Many lengths of ditch suffer from excessive weed growth and accumulated silts washed down from further upstream in the catchment.
- The Murchison Environmental Care Group (MECG) has been maintaining and provided environmental enhancements to a section of open drain within the Murchison UDA, through agreement with the Council. The aim of the MECG is to return stormwater ditches to their natural state, supportive of native flora and fauna species. Overall this has been successful, however, the capacity has been reduced and because a number of properties may be prone to flooding, Council has been asked to clear a section.
- A number of culvert crossings in upstream locations of the UDA severely restrict continuation stormwater flows, with estimated levels of service providing a capacity possibly less than a Q1 storm event.
- Murchison stormwater catchment is a dendritic non-linear catchment where there are four main sub catchments, which drain into one central point located in the centre of Murchison. At this point, storm flows are likely to converge at a particular time of concentration.

B.4.3. Asset Age and Condition

All pipe assets and non-piped assets were installed between 1970 and 2008.

Generally the assets in the Murchison UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, renewals projects are programmed for:

Fairfax Street (Asset Valuations 2009) and upgrade sumps (north and south).

B.4.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 60% of the network is not yet capable of containing a 1 in 5 year storm event.

Whilst there are no known recurrent surface flooding problems in the area affecting residential properties, historical flooding is thought to have occurred in fields upstream of Fairfax Street.

A particular deficient level of service is upstream of Fairfax Street to the intersection with the ditch network from Hotham Street and further upstream to the next intersection towards Hotham Street.

The majority of property owners maintain the streams on their property, however Council involvement is required where streams pass through reserves and other Council owned property and where property owners fail to carry out maintenance.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.4.5. Growth and Demand

Growth from new dwellings in Murchison township is expected to increase by 4% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.4.6. Operations and Maintenance

The primary operating and maintenance activity for Murchison is to ensure the open drainage channels are kept to a reasonable standard of repair.

A number of sections of ditch have had environmental improvement work, completed by the Murchison Environmental Care Group, which has included the planting of native plants and grasses, removing accumulated silts and debris to ditch base level, and removing weeds and plant growth. There is an agreement between the Council and the MECG for these enhancements to be made. The MECG was highly commended by the Council in the community group category for the Environmental Awards 2005.

The ditch network requires work in a number of areas to maintain the ditch banks, remove accumulation of weed growth, reinstate ditch beds and cut down vegetative growth restricting the flow path.

The operation and maintenance regime is included in Appendix E.

B.4.7. Strategic Studies

There are no existing strategic studies and models within the UDA.

B.4.8. Key Issues

The key issues for Murchison are:

- some assets are nearing the end of their design life or are in poor condition and need to be replaced
- 60% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.

B.4.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-7: Murchison Stormwater Assets

Murchison Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Culvert	154
SW-Extent of feature	38
SW-Pipe	1,391
Grand Total	**1,584**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Culvert	**154**
0	37
300	39
375	11
600	17
675	28
1200	24
SW-Extent of feature	**38**
0	38
SW-Pipe	**1,391**
150	218
200	317
225	166
300	314
450	300
500	33
600	15
1500	27
Grand Total	**1,584**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Culvert	**154**
Concrete	144
RCRRJ	11
SW-Extent of feature	**38**
(blank)	38
SW-Pipe	**1,391**
Concrete	456
Glazed Earthenware	140
PVC	4
RCRRJ	169
RCRRJ Class X	91
RCRRJ Class Y	11
Unknown	70
uPVC	449
Grand Total	**1,584**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Channel	10,899
Grand Total	**10,899**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Count of ASSETID
SW-Inlet	11
SW-Inlet structure	1
SW-Manhole	4
SW-Node	18
SW-Outlet	17
SW-Outlet structure	1
SW-Soakpit	9
SW-Sump	58
Grand Total	**119**

B.5 St Arnaud

B.5.1. Stormwater Overview

The St Arnaud settlement is surrounded by the Nelson Lakes National Park and located on the shores of Lake Rotoiti. The steep, glacial terrain surrounding St Arnaud has high run off flows. Recently a wastewater reticulation treatment and disposal system was installed for the area. Problems of sewage contamination into roadside and stormwater drains that discharge into Lake Rotoiti via Black Valley Stream have been solved.

The catchment area is divided into seven sub-catchments, refer to Appendix Y for a map of the catchments and UDA boundary.

St Arnaud has very few piped systems in the more established developments with predominant systems being runoff to open drains. While the majority of drainage within the built up area consists of small streams and roadside type open channels, the more recent sub divisions have been developed with piped stormwater systems.

A number of culvert crossings of the open drains over Main Road St Arnaud are the strategic parts of the stormwater system and are the responsibility of NZ Transport Agency to maintain.

In the past there have been problems with erosion in the open channel behind the footpath that goes down to the lake foreshore, and flooding to St Arnaud Hall and the Alpine Lodge, arising from the Black Valley Stream.

There is currently no stormwater treatment in place.

Table 10 shows the stormwater assets in St Arnaud.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

St Arnaud currently has no resource consents.

B.5.2. Asset Capacity and Performance

B.5.2.1 Primary Flow Paths

The Stormwater Catchment Study for St Arnaud (MWH New Zealand Ltd (MWH), November 2005) assessed catchment capacity as follows in Table B-8.

Table B-8: Assessment of St Arnaud Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Runoff (m^3/s)
A: Black Valley 1	Channel	*	89	98
B: Black Valley 2	Channel	*	85	98
C: Black Valley 3	Channel	*	590	98
D: Brookvale Drive	Channel	*	20	18
E: NZTA Catchment 1	Culvert	*	6.8	6
F: NZTA Catchment 2	Culvert	*	13	23
G: NZTA Catchment 3	Culvert	*	12	19

Source: Stormwater Catchment Study for St Arnaud (MWH New Zealand Ltd, November 2005)

* Not assessed

Table B-8 above shows that culverts in catchments A, B, F and G have insufficient capacity.

B.5.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.5.2.3 Performance

No CSR records have been recorded in Confirm for the period 2008 to 2011.

Performance issues for St Arnaud UDA are.

- This is located within a National Park and therefore any development work or modification work to the existing stormwater system is subject to National Park regulations.
- Future residential development is likely to be very limited and restricted by National Park regulations.
- The Black Valley Stream drains a large area of land and passes in close proximity to a number of residential properties and the Alpine Lodge and St Arnaud Hall. The stream is prone to debris accumulation and fallen trees, which cause flow restrictions.
- The Black Valley Stream culverts crossing Bridge Street and State Highway 63 suffer from regular blockages from debris accumulation.
- Local flooding in Brookvale Drive from access way construction.

B.5.3. Asset Age and Condition

All pipe assets were installed between 2000 and 2008. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the St Arnaud UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. Therefore there are no asset renewals planned for the period of this AMP.

B.5.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.5.5. Growth and Demand

Growth from new dwellings in St Arnaud township is expected to increase by 12% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.5.6. Operations and Maintenance

Regular maintenance of the culverts is required and liaison with DoC regarding stream bed clearance, and with NZ Transport Agency regarding maintenance of culverts on the State Highway.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.5.7. Strategic Studies

Table B-9 following lists key existing strategic studies and models within the UDA:

Table B-9: Existing Strategic Studies and Models for the St Arnaud UDA

Title	Month	Year	Author	Purpose
St Arnaud Stormwater Catchment Study	November	2005	MWH	Investigates potential long and short term options to control flooding in St Arnaud area.

B.5.8. Key Issues

The key issues for St Arnaud are:

- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.

B.5.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-10: St Arnaud Stormwater Assets

St Arnaud Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Culvert	124
SW-Pipe	1,412
Grand Total	**1,536**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Culvert	**124**
225	22
300	28
450	20
1050	53
SW-Pipe	**1,412**
100	181
150	40
225	157
300	295
375	98
450	113
525	254
675	156
750	91
825	28
Grand Total	**1,536**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Culvert	**124**
Concrete	36
RCRRJ	66
Unknown	22
SW-Pipe	**1,412**
Concrete	15
RCRRJ	1,061
Unknown	78
uPVC	258
Grand Total	**1,536**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Channel	1,033
Grand Total	**1,033**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Count of ASSETID
SW-Inlet structure	3
SW-Manhole	24
SW-Node	7
SW-Sump	30
Grand Total	**64**

B.6 Tapawera UDA

B.6.1. Stormwater Overview

Tapawera was constructed by NZ Forest Service as a forestry headquarters village.

There are a limited number of piped stormwater systems within the urban drainage area that discharge into a series of open channels which flow into the Motueka River.

The catchment area is divided into four sub catchments totalling 254.3ha, refer to Appendix Y for a map of the catchments and UDA boundary.

A gravel fan outflows from steep hillside country that defines the Motueka River Valley, situated behind the east side of the township. During the village construction, groundwater issues in the residential area became significant and a substantial drainage cut off system was constructed to the east of the village at the foot of the gravel fan. Failure of this system presents a risk to the township area of surface flooding and very wet ground conditions. This is unlikely to cause rapid inundation of buildings but more likely to cause surface flooding in the area.

A stream intercepts flows from a large area to the south of Tapawera which drains an area of flood plain between the gravel fans and Motueka River. This stream passes through the UDA, crossing Main Road Tapawera and Tadmor Valley Road, before leaving the UDA and discharging into the Motueka River. This is the keystone of the Tapawera stormwater system which collects stormwater flows from open drain and the piped stormwater systems.

There is currently no stormwater treatment in place.

Table B-13 shows the stormwater assets in Tapawera.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Tapawera currently has no resource consents.

B.6.2. Asset Capacity and Performance

B.6.2.1 Primary Flow Paths

The Stormwater Catchment Study for Tapawera (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-11.

Table B-11: Assessment of Tapawera Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 1500 dia	4.78	Q_{35}	6.00	> Q_{100}	5.05
B: Twin 900 dia	1.83	Q_{50}	4.58	> Q_{100}	1.83
C: Twin 750 dia	2.46	> Q_{100}	2.91	> Q_{100}	1.58
D: Twin 750 dia	2.20	Q_5	3.45	Q_{50}	3.48
E: 550 dia.	0.56	Q_2	0.69	Q_3	1.29

Source: Stormwater Catchment Study for Tapawera (MWH New Zealand Ltd, May 2008)

Table B-11 above shows that Culvert E is potentially undersized.

B.6.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.6.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Open Drains (non roading)	Grand Total
Tapawera	1	1

Source: Confirm

Other performance issues for the Tapawera UDA are.

- The settlement is small and self-contained but vulnerable to surface flows from outside the UDA.
- A key interception drainage ditch was constructed by the forestry board but is now maintained by Council.
- A number of properties on Matai Crescent are vulnerable to flooding from surface flows arising from the stream/ open channel to the south of Tapawera, particularly in the event of a blockage of the twin 750 dia. culvert crossing on the Motueka Valley Highway.
- There are concerns over the level of service offered by the main stream crossing main road Tapawera to the south which may put properties on Matai Crescent at risk of flooding.
- Both the road drainage and property runoff is collected by a piped stormwater system within the Tapawera UDA and much of this system discharges into a swale type open water channel in the centre of the UDA.
- The culvert crossings for the network of streams and drains are estimated to provide a level of service to cope with between a 1 in 10 and 20 storm return period.
- There are concerns over the level of service offered by the main stream crossing main road Tapawera to the south which may only offer a level of service for a 1 in 5 year storm event.

B.6.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1973 and 2008.

Generally the assets in the Tapawera UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, the Forestry Board Drain and Matai Crescent Drain require reshaping and gravel extraction to return them to their original design. Renewal projects are programmed to address this.

B.6.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 10% of the network is not yet capable of containing a 1 in 5 year storm event.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.6.5. Growth and Demand

Growth from new dwellings in Tapawera township is expected to increase by 25% over the next 20 years (Source: Volume 2 of the Growth Model – 9 August 2011).

B.6.6. Operations and Maintenance

Regular maintenance of the culverts is required. Details of the operations and maintenance schedule are enclosed in Appendix E.

B.6.7. Strategic Studies

Table B-12 below lists key existing strategic studies and models within the UDA

Table B-12: Existing Strategic Studies and Models the Tapawera UDA

Title	Month	Year	Author	Purpose
Tapawera Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Tapawera area.

B.6.8. Key Issues

The key issues for Tapawera are.

- Some assets are nearing the end of their design life or are in poor condition and need to be replaced.
- 10% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.
- The existing system will not be able to maintain service levels at predicted levels of growth.

B.6.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-13: Tapawera Stormwater Assets

Tapawera Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Culvert	137
SW-Pipe	3,399
Grand Total	**3,537**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Culvert	**137**
750	36
900	75
1500	27
SW-Pipe	**3,399**
100	34
150	179
225	102
230	202
300	2,060
375	399
450	91
455	95
525	137
600	101
Grand Total	**3,537**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Culvert	**137**
Concrete	118
Unknown	19
SW-Pipe	**3,399**
Asbestos Cement	596
Concrete	2,141
PVC	13
RCRRJ	473
RCRRJ Class X	50
Unknown	126
Grand Total	**3,537**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Channel	362
Grand Total	**362**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Count of ASSETID
SW-Cleaning eye	3
SW-Inlet	4
SW-Manhole	36
SW-Node	9
SW-Outlet	8
SW-Soakpit	9
SW-Sump	53
Grand Total	**122**

B.7 Motueka UDA

B.7.1. System Overview

Motueka has a long history of flooding problems because of its low lying nature, flat terrain, and alluvial gravels with high water table, proximity to the Motueka River and Tasman Bay.

The catchment area is divided into nine sub catchments, refer to Appendix Y for a map of the catchments and UDA boundary.

The Motueka UDA is mostly developed less densely than Richmond due to the size of the properties, mostly quarter-acre sections. A considerable amount of stormwater drainage is by soakage to the underlying soils and gravels.

The UDA drains from three main areas:

- into the Motueka River in the north west via Staples Drain
- into a small enclosed tidal lagoon through the Lammas Drains in the north east
- into a small enclosed tidal lagoon in the south, through the Thorp and Woodlands Drains.

Both tidal lagoons are protected by tidal gates, to control against high tidal surge / flooding into lower areas of the Motueka township, the former discharges into Tasman Bay, the latter into the Moutere Inlet.

The dominant piped drainage direction is from west to east. To the north of Motueka the drainage infrastructure is largely informal with a large reliance on discharge to groundwater and/or shallow swales. The ultimate outlet is via two small surface drains, Staples Drain and Lammas Drain.

The bulk of the central area drains to either the Thorp or Woodlands Drains which run north to south between High Street and Thorp Street. Originally all drainage flowed east until it met the coastal ridge that Thorp Street runs along. This turned the flow south into the Moutere Inlet, a large tidal estuary, via Thorp Drain. Frequent flooding of the upper end of Thorp Drain caused the construction of Woodlands Drain and Wilkinson Drain, a parallel drain slightly further west. The aim of this was to cut off the main flows from the west and discharge them earlier to the estuary. A further extension of this philosophy saw the construction of a new system in High Street to prevent flooding in the commercial and retail centre of Motueka.

The remainder of Motueka is drained via small piped stormwater systems discharging directly to sea or adjacent open channels.

Very few parts of the stormwater reticulation were designed in accordance with former performance standards, providing a 1 in 5 year level of service. The former Motueka Borough Council standard was for pipes to pass 1 in 2 year storm flow events.

Recent developments between Thorp Street and Motueka Quay have included the construction of detention ponds to enable piped coastal outlets to operate against high tidal levels. In addition, other recent developments have seen the use of soak pits as the primary stormwater discharge system, returning storm flows to ground.

Three substantial stormwater outlet structures exist in the system:

- Wharf Road culvert tidal gates (draining the southern tidal lagoon, controlling Woodlands and Thorp Drain discharges)
- Old Wharf Road tidal gates (secondary tidal gates, controlling flows from the Woodlands Drain)
- Staple Street tidal gates (draining the northern tidal lagoon, controlling Lammas Drain discharges).

The operation of control gates on Wharf Road and Old Wharf Road are controlled via Council's telemetry system.

Four open stormwater channels discharge collected stormwater from the township:

- Lammas Drain
- Staples Drain
- Woodlands Drain
- Thorp Drain.

There is currently no stormwater treatment in place.

Table 6 shows the stormwater assets in Motueka.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Motueka currently has the following resource consents.

RM110089: To locate, operate and maintain a utility and to undertake earthworks in High Street and Eginton Street, Motueka (expires 15 February 2012).

RM110090: To take and divert groundwater by dewatering and discharge to either the stormwater or sewerage system in High Street and Eginton Street, Motueka (expires 15 February 2012).

B.7.2. Asset Capacity and Performance

B.7.2.1 Primary Flow Paths

The Motueka UDA Development Impact Levy for Stormwater (MWH New Zealand Ltd, 2004) assessed catchment capacity as follows in Table B-14.

Table B-14: Assessment of Motueka Catchment Capacity

Catchment	Current Capacity (m^3/s)	Q_5 Storm Flow (m^3/s)	Q_{50} Storm Flow (m^3/s)
A: Central	*	7.1	12.9
B: Woodlands	*	5.6	10.2
C: King Edward	*	5.7	10.3
D: Courtney	*	3.3	5.9
E: Thorpes	*	3.1	5.7
E: Motueka Quay	*	2.9	5.3
E: East Motueka	*	2.2	4.1
E: Staples	*	1.5	2.7
E: North Motueka	*	2.9	5.2

Source: Motueka UDA Development Impact Levy for Stormwater (MWH New Zealand Ltd, 2004)

* Not assessed

There is a stormwater model for the Motueka UDA but it is very old. The hydraulic model is currently being updated by MWH New Zealand Ltd.

B.7.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.7.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Health Nuisance	Manhole Cover Missing	Open Drains (non roading)	Other	Pipe Break/ Blockage	Grand Total
Motueka	36	1	6	16	29	13	101

Source: Confirm

Other performance issues for Motueka UDA are:

- it is flat with very little hydraulic gradient to get good drainage
- drainage from ditches is subject to tidal influences
- the stormwater system in the town centre lacks a number of stormwater collection sumps along the High Street and the system in this area is already overloaded
- the system has been assessed as being unable to cope with Q_5 return period storm flows in a number of areas
- many secondary flow paths are wide given the flat gradients and often follow streets and roads
- there are several locations where roads or natural topographical features block the overland flow paths, therefore increasing the risk of flooding
- the road network and the housing development make it very difficult to restore an overland flow path that directs overland flows away from houses.

B.7.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1962 and 2008.

While the stormwater systems in Motueka are older than many in the district, there is not a great deal of knowledge about the system's condition. From inspections carried out under the maintenance contract and local knowledge, it is thought likely that the condition of a number of the older assets is poor. Renewal work is typically preceded by CCTV investigations to identify works that need repair and to scope the severity and extent of the problems.

Renewals projects are programmed for the following assets due to them meeting the end of their design life:

- flap gates
- tidal gates
- Pah/Atkins Streets
- Parker Street.

B.7.4. Compliance with Level of Service

MWH New Zealand Ltd NZ Limited investigated the performance of the stormwater system using hydraulic modelling and issued a report[2] making recommendations to upgrade the stormwater system. In 1999/2000 a Motueka Stormwater Strategy was developed which used hydraulic modelling to assess system performance. The outcomes of this investigation are reported in depth in Motueka Stormwater Strategy, April 2000.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended that Council prepare a Catchment Management Plan to improve understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

[2] MWH NZ Ltd report "Motueka Stormwater Strategy, April 2000

Workshops were held with the Council staff in 2011 to discuss gaps in existing Levels of Service. The following projects were identified.

- A Catchment Management Plan and Resource Consent have been programmed for Motueka in Operations and Capital budgets (respectively) to meet the Levels of Service.
- Jocelyn Avenue upgrade to reduce flooding.
- Develop a strategy subject to recommendations of the Stormwater Model 2011/12. Maybe Boyce/Clay Streets (identified in the last AMP) to reduce flooding.
- Flap Gates Renewal, Pah/Atkins Street Upgrade, Parker Street Upgrade, and New Development Areas. Network upgrade to accommodate new development and upgrade existing system from the area north of King Edward Street and connecting to the Woodland Drain are partially required to meet levels of service.

B.7.5. Growth and Demand

Growth from new dwellings in Motueka township is expected to increase by 17% over the next 20 years (Source: Volume 2 of the Growth Model - 09/08/2011).

B.7.6. Operations and Maintenance

The primary operating and maintenance activity for Motueka is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.7.7. Strategic Studies

Table B-15 below lists key existing strategic studies and models within the UDA.

Table B-15: Existing Strategic Studies and Models for the Motueka UDA

Title	Month	Year	Author	Purpose
Motueka Urban Drainage Area Development Impact Levy for Stormwater		2004	MWH	Investigates proportion of upgrade costs due to growth in Motueka, development contributions.
Te Maatu Subdivision, Motueka	May	2005	TCB	Investigates options to manage stormwater from subdivision and surrounding residential areas.

B.7.8. Key Issues

The key issues for Motueka are:

- some assets are nearing the end of their design life or are in poor condition and need to be replaced
- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.7.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-16: Motueka Stormwater Assets

Motueka Stormwater Assets

Source: Confirm Asset Data 6 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Culvert	157
SW-Extent of feature	79
SW-Pipe	41,941
Grand Total	42,176

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Culvert	157
0	82
300	76
SW-Extent of feature	79
0	79
SW-Pipe	41,941
0	300
100	2,049
150	874
160	215
200	281
225	4,317
230	125
300	9,338
375	4,395
380	122
450	5,980
460	67
525	1,432
575	10
600	5,551
675	213
750	2,176
825	967
900	1,263
1050	289
1075	271
1078	61
1200	1,324
1350	319
Grand Total	42,176

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Culvert	157
Concrete	85
RCRRJ	16
Unknown	56
SW-Extent of feature	79
Not known	79
SW-Pipe	41,941
Alufio Aluminium Corrugated	159
Concrete	12,922
Galvanized Iron	7
Glazed Earthenware	12
Novaflow	215
PVC	717
RCFJ	828
RCRRJ	9,089
RCRRJ Class X	5,807
RCRRJ Class Y	1,242
RCRRJ Class Z	697
Steel	11
Unknown	7,833
uPVC	2,402
Grand Total	42,176

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Channel	42,071
Grand Total	42,071

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Count of ASSETID
SW-Chamber	3
SW-Cleaning eye	11
SW-Collection pond	1
SW-Control cabinet	2
SW-Floodgate	4
SW-Inlet	18
SW-Inlet structure	3
SW-Inspection point	5
SW-Manhole	456
SW-Miscellaneous item	4
SW-Node	164
SW-Outlet	56
SW-Outlet structure	11
SW-Soakpit	50
SW-Sump	792
SW-Telemetry	2
SW-Valve	2
Grand Total	1,584

B.8 Mapua and Ruby Bay UDA

B.8.1. System Overview

The Mapua/Ruby Bay UDA is an urban/coastal development. The Ruby Bay area is a coastal strip with recently developed land being controlled by stormwater detention systems. Mapua is a mixture of urban and semi-urban development with the majority of stormwater from earlier developments going to soakage. Only recent development has included piped stormwater systems, which most discharge into open drains and then into the Mapua estuary. The major piped stormwater system on Aranui Road picks up much of the new piped systems and discharges into the estuary by the Mapua wharf.

The catchment area is divided into 22 sub catchments totalling 1,075.3 Ha, refer to Appendix Y for a map of the catchments and UDA boundary.

The Toru Street Causeway acts as a tidal barrier to high tidal flows entering into the inner estuary and protects a large part of Mapua from flooding. A tidal gate on the end of the Aranui Road stormwater pipe protects the reticulated piped system from high tidal level intrusion.

A significant land area forms the upper part of the Mapua UDA, currently undeveloped and located inland from the Coastal Highway and Stafford Drive. Parts of this area are low lying and are unlikely to be developed, particularly the area immediately adjacent to the Coastal Highway and Seaton Valley Drain which is an old swamp, now drained and protected with a tidal flood bank by the current landowner.

The catchment upstream of the Coastal Highway and Stafford Drive drains out through an open waterway, the Seaton Valley Stream. This passes through a culvert under Stafford Drive and discharges into the Toru Street inner estuary further downstream.

The causeway has a major influence on the level of service provided by the Seaton Valley Stream. The area draining into the Seaton Valley Stream accounts for 65% of the Mapua/Ruby Bay drainage area.

There are two other distinct stormwater systems draining the Mapua UDA, the Broadsea and Pinehill Heights areas. Both drain directly to the Tasman Sea through a number of stormwater culverts.

In 2003/04, a desk-based study[3] of the stormwater system was done for the purposes of assessing financial contributions from developers. This was a high level study of the catchment and it concluded that:

- the existing reticulation does not comply with required levels of service
- further development in the area will increase the problem.

Following on from this report, a hydraulic model was constructed of the Mapua township and drainage area of the Seaton Valley Stream and upgrade options to improve the level of service of the open drains in the area were assessed. The modelling study was completed by MWH New Zealand Ltd and issued to Council in June 2006 and later updated in August 2007[4].

The report recommended modifying the Causeway tidal outlets, widening the Seaton Valley Stream including upgrading a number of road crossings and some upgrade work to other open channels, namely the School Road Drain and drainage improvement work around Aranui Road. The report took into account planned development, and current predicted sea level rises. The outcomes of the modelling report have helped to form Councils policy on future sub division development within the UDA.

The report has led Council to submit a resource consent application to widen the Seaton Valley Stream and upgrade the Toru Street Causeway, currently under consideration, with planned upgrade works in mind.

There is currently no stormwater treatment in place.

Table 9 shows the stormwater assets in Mapua and Ruby Bay.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

[3] Refer Mapua Stormwater DILs, MWH report, March 2004

[4] Refer Mapua Causeway and Seaton Valley Drain Floodplain Hydraulics Analysis, August 2007

Mapua currently has the following resource consents.

- RM080112 to undertake work in Seaton Valley Stream (lapses in 29 July 2019, expires 29 July 2044).
- RM080113 to discharge water containing contaminants (lapses in 29 July 2019, expires 29 July 2044).
- RM080260 to undertake earthworks (lapses in 29 July 2019, expires 29 July 2044).
- RM080261 to dam water upstream of causeway (lapses in 29 July 2019, expires 29 July 2044).
- RM080262 to construct new flap gates at causeway (lapses in 29 July 2019, expires 29 July 2044).
- RM061006 Pinehill Stream maintenance - Disturbance of the coastal marine area resulting from the on-going maintenance of the mouth of Pinehill Stream at Ruby Bay for a period of 35 years. The disturbance involves the clearance of the mouth of the stream where it emerges onto the Ruby Bay foreshore (typically twice a year) using mechanical diggers or excavators and the placement of the excavated beach gravel at the head of the beach fronting the neighbouring properties. (expires 12 December 2041).

B.8.2. Asset Capacity and Performance

B.8.2.1 Primary Flow Paths

The Mapua Stormwater DILs Study (MWH New Zealand Ltd, March 2004) assessed pipe capacity as follows in Table B-17.

Table B-17: Assessment of Mapua and Ruby bay Pipe Capacity

Culvert	Size	Estimated Capacity (L/s)	Q_5 Discharge (L/s)	Q_{50} Discharge (L/s)
A: Seaton Valley 1	3m Armco	8500 if 1 in 500	4059	12615
B: Seaton Valley 2	900	1300	1251	3888
C: Seaton Valley 3	300	70	97	302
D: Seaton Valley 4	750	750	1112	3456
E: Aranui Park 1	450	140	121	345
F: Aranui Park 2	450	140	286	811
G: Aranui Park 3	550	250	201	571
H: Aranui Park 4	450	140	201	570
I: Aranui Park 5	900	850	733	2082
J: Jessie 1	300	120	317	751
K: Jessie 2	300	50	224	506
L: Jessie 3	750	550	691	1636
M: Causeway	Twin 900	1060	4633	14536
N: Moreland	450	140	455	979
O: Toru	Two 300	100	445	956
P: Smokehouse 1	600	300	693	1490
Q: Smokehouse 2	525	210	317	575
R: Higgs 1	600	300	534	1207
S: Higgs 2	300	70	129	292
T: Higgs 3	225	33	129	292
U: Langford 1	375	85	259	584
V: Langford 2	750	550	1012	2274
W: Langford 3	225	50	86	195

Culvert	Size	Estimated Capacity (L/s)	Q_5 Discharge (L/s)	Q_{50} Discharge (L/s)
X: Langford 4	750	550	1254	2762
Y: Langford 5	300	70	134	289
Z: Langford 6	375	130	207	467
AA: Broadsea 1	375	85	207	607
AB: Broadsea 2	400	85	227	665
AC: Broadsea 3	450	140	673	1973
AD: Tait	300	50	259	556
AE: Pomona	400	85	282	666
AF: Ruby Bay 1	1800	5300	2994	9541
AG: Ruby Bay 2	300	50	83	200
AH: Brabant 1	300	50	645	1548
AI: Brabant 2	300	70	124	300
AJ: Brabant 3	300	70	124	300
AK: Brabant 4	225	33	76	183
AL: Brabant 5	225	33	207	500
AM: Brabant 6	600	825	145	350
AN: Brabant 7	300	50	867	2052

Source: Mapua Stormwater DILs Study (MWH New Zealand Ltd, March 2004)

Table B-17 above shows that the majority of pipes are potentially undersized.

B.8.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.8.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Manhole Cover Missing	Open Drains (non roading)	Other	Pipe Break/ Blockage	Grand Total
Mapua	3	1		3	3	10
Ruby Bay	9		5	8	7	29

Source: Confirm

Other performance issues for Mapua/ Ruby Bay UDA are:

- lack of gradient in the main channels and pipe systems
- low lying flat areas which are susceptible to ponding and flooding
- major tidal influences on all the outlets with significant effects at the causeway
- lack of capacity in major sections of the reticulated system
- maintenance problems with the outfalls blocking with shingle and debris from high tides/storms.

B.8.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1971 and 2008.

Generally the assets in the Mapua/Ruby Bay UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

However, the Seaton Valley resource consent may need renewal if no effect is given by 2019.

B.8.4. Compliance with Level of Service

The Mapua DIL Study and the recent modelling work highlighted a significant lack of capacity in the existing stormwater systems.

The model was calibrated with the last major storm event in June 2003, when large parts of Mapua were under water. This showed that many areas adjacent to the Seaton Valley Stream would flood with a storm event in the order of 1 in 50 year return period. Climate change and sea level rises have also been factored into the modelling which recommends urgent upgrade work to be completed for further development to take place.

The level of service for the open drain system for future upgrades is a 1 in 100 year storm event. For the reticulated piped stormwater system, capacity will be provided for a 1 in 20 year storm.

Significant upgrade work has recently been competed in Mapua on the piped stormwater system in Aranui Road and Higgs Road to improve the existing level of service.

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 10% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a Resource Consent application for discharge in accordance with the TRMP.

B.8.5. Growth and Demand

Growth from new dwellings in the Mapua and Ruby Bay townships is expected to increase by 37% (collectively) over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.8.6. Operations and Maintenance

The primary operating and maintenance activity for Mapua is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.8.7. Strategic Studies

Table B-18 below lists key existing strategic studies and models within the UDA.

Table B-18: Existing Strategy Studies and Models for the Mapua/Ruby Bay UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Mapua Stormwater DILs	March	2004	MWH	Investigates proportion of upgrade costs due to growth in Mapua development contributions.
Mapua Stormwater Investigations Higgs Road	May	2005	MWH	Investigates current level of service provided to Higgs Road and Langford Drive areas and options to prevent flooding.
Mapua Causeway and Seaton Valley Stream Flood Capacity Upgrade	February	2008	MWH	Resource Consent Application and AEE.

B.8.8. Key Issues

The key issues for Mapua/Ruby Bay are:

- 10% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection
- The existing system will not be able to maintain service levels at predicted levels of growth.

B.8.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-19: Mapua and Ruby Bay Stormwater Assets

Mapua Ruby Bay Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	139
SW-Pipe	8,651
Grand Total	8,789

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	139
225	13
300	12
375	79
450	26
920	10
SW-Pipe	8,651
0	25
100	513
150	757
200	99
225	1,773
250	87
300	2,696
375	828
380	30
400	97
450	500
525	152
600	518
675	116
750	116
900	29
1050	132
1200	175
1800	17
2500	13
Grand Total	8,789

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	139
RCRRJ	111
Unknown	28
SW-Pipe	8,651
Concrete	1,503
Galvanized Iron	4
HDPE	32
PVC	459
RCFJ	96
RCFJ Class X	6
RCRRJ	2,472
RCRRJ Class X	970
RCRRJ Class Y	324
RCRRJ Class Z	369
Unknown	1,310
uPVC	1,105
Grand Total	8,789

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Channel	15,612
SW-Extent of feature	93
Grand Total	15,705

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Count of ASSETID
SW-Cleaning eye	5
SW-Floodgate	1
SW-Inlet	15
SW-Inlet structure	6
SW-Manhole	112
SW-Node	41
SW-Outlet	33
SW-Outlet structure	7
SW-Pump	1
SW-Soakpit	4
SW-Sump	174
Grand Total	399

B.9 Tasman UDA

B.9.1. System Overview

Tasman is a small settlement with approximately150 people, situated close to the edge of the Moutere Inlet and on State Highway 60 (Coastal Highway). The settlement is within an area between Dicker Road and Baldwin Road on land rising away from the State Highway which is rural and mostly pasture land.

The catchment area is divided into three sub catchments totalling 1,150ha, refer to Appendix Y for a map of the catchments and UDA boundary.

Surface flows drain from south to north, discharging through the Marriages Stream, into the Moutere Inlet. The stream drains much of the catchment area and picks up open drains from rural land use, including the road drainage off State Highway 60.

Some areas of recent rural subdivisions and lifestyle block type developments have been completed around the Tasman settlement in recent years. However, much of this development is spread out and does not contribute to stormwater flows entering into the settlement.

The stormwater system in the settlement is limited to some small piped systems although is predominantly open drained.

A serious flooding problem occurred as a result of a storm in May 2006. This resulted in flooding a number of buildings by the corner of Baldwin Road and the Coastal Highway as well as flooding parts of the State Highway.

State Highway 60 effectively forms a barrier for the natural drainage of the Tasman urban area to flow into the Moutere Inlet. The Marriages Stream passes along the other side of the Coastal Highway from the Tasman settlement, while along the other runs a smaller open drain, intercepting drainage from various smaller drainage areas to the south, draining areas along Baldwin Road, William Road, Orion Road, etc. However, the Coastal Highway has formed a barrier to natural drainage flows passing straight into the Marriages Stream and as a result flows are only able to pass under the highway in a small number of strategic locations.

In the event of the under capacity of the highway culverts or open channel on the same side as Tasman settlement, flows continue towards Tasman where they eventually pass into the centre of the settlement and cause flooding of properties and roads. This is what happened in May 2006 during the last major flood event.

There is currently no stormwater treatment in place.

Table B-22 shows the stormwater assets in Tasman.

The confidence of this data is reliable (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Tasman currently has no resource consents.

B.9.2. Asset Capacity and Performance

B.9.2.1 Primary Flow Paths

The Stormwater Catchment Study for Tasman (MWH New Zealand Ltd, July 2006) catchment capacity as follows in Table B-20.

Table B-20: Assessment of Tasman Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Q_{50} (m^3/s)
A: Golf Course	Channel	31	2.00	3.15
B: Baldwin Road	Channel	62	4.00	5.93
C: Marriages Stream	Channel	1100	25-40*	31.00

Source: Stormwater Catchment Study for Tasman (MWH New Zealand Ltd, July 2006)

* Tidal influence

Table above shows that all channels in the catchments have insufficient capacity.

B.9.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.9.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Open Drains (non roading)	Grand Total
Tasman	3	3

Source: Confirm

Other performance issues for Tasman UDA are.

- the susceptibility to flooding from flows arising outside the UDA
- the culvert crossings under main road are critical assets to maintain
- there is little scope / opportunity to improve the hydraulic capacity of the culverted section of open drain passing under buildings on Baldwin Road.

B.9.3. Asset Age and Condition

All pipe assets were installed between 1980 and 2006. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Tasman UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.9.4. Compliance with Level of Service

A Stormwater Catchment Study was completed in July 2006 and assessed the impact/ causes of the 2006 flood event, including investigating solutions to improve the level of service of the local stormwater system. The report indicated that while the small piped stormwater system was severely restricted in capacity in a culverted section over which the shop and art gallery had been built over, the capacity of the culverts passing under the State Highway further upstream was also a major contributing factor to the flooding event

Flooding issues at the junction of Baldwin Road and the State Highway, are in the process of being eliminated. This will include local modifications to the local reticulated stormwater pipe system and solutions to pass increased stormwater flows across the State Highway to join the Marriages Stream, south of the settlement.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 40% of the network is not yet capable of containing a 1 in 5 year storm event.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.9.5. Growth and Demand

Growth from new dwellings in Tasman township is expected to increase by 19% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.9.6. Operations and Maintenance

The primary operating and maintenance activity for Tasman is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.9.7. Strategic Studies

Table B-21 below lists key existing strategic studies and models within the UDA.

Table B-21: Existing Strategic Studies and Models for the Tasman UDA

Title	Month	Year	Author	Purpose
Tasman Stormwater Catchment Study	July	2006	MWH	Investigates potential long and short term options to control flooding in Tasman area.

B.9.8. Key Issues

The key issues for Tasman are:

- 40% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.9.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-22: Tasman Stormwater Assets

Tasman Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Culvert	17
SW-Pipe	339
Grand Total	357

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Culvert	17
300	17
SW-Pipe	339
225	20
300	194
375	125
Grand Total	357

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Culvert	17
RCRRJ	17
SW-Pipe	339
Concrete	23
RCRRJ	157
Unknown	159
Grand Total	357

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Channel	283
Grand Total	283

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Count of ASSETID
SW-Manhole	6
SW-Outlet	2
SW-Sump	4
Grand Total	12

B.10 Kaiteriteri

B.10.1. System Overview

The Kaiteriteri stormwater area contains mostly residential and holiday type home development with two significant motor camps. The steep hilly nature of the Kaiteriteri area provides high run off to the stormwater system. Discharges either from pipe systems or small drains are direct to the sea or the Kaiteriteri Inlet.

The catchment area is divided into 12 sub catchments, refer to Appendix Y for a map of the catchments and UDA boundary.

A small wetland area is situated at the lower point of Rowling Road in Little Kaiteriteri. Open drains within the area present significant problems with the decomposed granite sandy material being easily scoured by relatively small flows.

Much of the catchment is forested and could be at risk of increased runoff flows from logging activities. Much of the catchment runoff is intercepted by drains, which discharge to sea in the Kaiteriteri Inlet. These drains converge on Martins Farm Road.

There is currently no stormwater treatment in place.

Table B-25 shows the stormwater assets in Kaiteriteri.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Kaiteriteri currently has two resource consents:

- RM070348 to occupy the coastal marine area (expires 29 June 2042).
- RM070349 to disturb the coastal marine area for the placement of culverts on the Martin Farm Road (expires 29 June 2012) – this project was completed in 2009/10.

B.10.2. Asset Capacity and Performance

B.10.2.1 Primary Flow Paths

The Stormwater Catchment Study for Kaiteriteri (MWH New Zealand Ltd, November 2005) assessed catchment capacity as follows in Table B-23.

Table B-23: Assessment of Kaiteriteri Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Runoff (m^3/s)
A: Martins Farm 1	Channel	*	7.50	11.40**
B: Martins Farm 1A	Channel	*	0.95	0.64
C: Martins Farm 2	Channel	*	0.42	2.40**
D: Wetland and Estuary	Culvert	*	0.75	*
E: Martins Farm 3	Channel	*	1.40	0.80
F: Martins Farm 3A	Culvert	*	1.50	0.84
G: Stephens Bay	Channel	*	4.50	2.70
H: Little Kaiteriteri	Channel	*	1.55	1.10
I: Tapu Bay South	Culvert	*	0.35	0.27
J: Tapu Bay North	Culvert	*	0.50	0.21
K: Tapu Bay 600	Pipe	*	1.40	0.47
L: Motorcamp	Pipe	*	1.28	1.24

Source: Stormwater Catchment Study for Kaiteriteri (MWH New Zealand Ltd, November 2005)

* Not assessed
** There was a project completed in 2009/10 to upsize the Martins Farm capacity.

Table B-23 above shows that all infrastructure in the catchments have sufficient capacity.

B.10.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.10.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Other	Pipe Break/Blockage	Grand Total
Kaiteriteri	1	1	1	3

Source: Confirm

Other performance issues for Kaiteriteri UDA are.

- This is a high profile tourist area in an area of outstanding natural beauty.
- Stormwater outfalls discharge across the beach and due to the location, are subject to sand infiltration.
- There have been a number of stormwater problems along the beach frontage as private property has either developed or has been redeveloped. However, this was mostly resolved with improvement work to the main beach frontage area.
- Kaiteriteri UDA has a number of stormwater outfalls, around Stephens Bay, Tapu Bay, Little Kaiteriteri and Kaiteriteri Bay, most which are prone to blockage with sand.
- Recent development has compounded capacity issues with the reticulated pipe systems particularly around the area of Little Kaiteriteri. At times this area suffers from system overloads. The problem arises from additional stormwater flows arriving from development behind existing densely developed areas. The ground rises steeply away from the coastline and there is still a significant area to be developed between Talisman Heights and Kotare Place on steeply rising ground.

B.10.3. Asset Age and Condition

All pipe assets were installed between 1963 and 2008. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Kaiteriteri UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. Therefore there are no asset renewals planned for the period of this AMP.

B.10.4. Compliance with Level of Service

MWH New Zealand Ltd completed a review of the stormwater system and issued a report in September 2005[5], making recommendations to address maintenance issues and to accommodate future development, in order to provide a satisfactory level of service.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

[5] MWH Report, Kaiteriteri Stormwater Catchment Study, September 2005

B.10.5. Growth and Demand

Growth from new dwellings in Kaiteriteri township is expected to increase by 17% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.10.6. Operations and Maintenance

Regular maintenance of the outfalls to remove sand infiltration is required. Details of the operations and maintenance regime are included in Appendix E.

B.10.7. Strategic Studies

Table B-24 below lists key existing strategic studies and models within the UDA.

Table B-24: Existing Strategic Studies and Models for the Kaiteriteri UDA

Title	Month	Year	Author	Purpose
Kaiteriteri Stormwater Catchment Study	November	2005	MWH	Investigates potential long and short term options to control flooding in Kaiteriteri area.

B.10.8. Key Issues

The key issues for Kaiteriteri are:

- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.

B.10.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-25: Kaiteriteri Stormwater Assets

Kaiteriteri Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Culvert	393
SW-Pipe	5,938
Grand Total	**6,331**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Culvert	**393**
300	7
375	264
450	28
600	67
900	14
1200	13
SW-Pipe	**5,938**
0	71
100	510
150	633
200	24
225	2,304
300	1,503
375	425
450	182
600	256
900	29
Grand Total	**6,331**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Culvert	**393**
RCRRJ	393
SW-Pipe	**5,938**
Concrete	319
PVC	279
RCRRJ	2,911
RCRRJ Class X	958
RCRRJ Class Z	54
Unknown	403
uPVC	1,016
Grand Total	**6,331**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Channel	228
Grand Total	**228**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Count of ASSETID
SW-Cleaning eye	10
SW-Inlet	16
SW-Inlet structure	3
SW-Manhole	122
SW-Node	11
SW-Outlet	20
SW-Outlet structure	5
SW-Soakpit	1
SW-Sump	133
Grand Total	**321**

B.11 Takaka UDA

B.11.1. System Overview

The Takaka UDA consists mostly of developed flat land and is situated in the flood plain of the Takaka River. In July 1983 the township was largely flooded with water from the Takaka River; however, events of a similar magnitude have not occurred since that date.

The catchment area is divided into ten sub catchments totalling 73.8ha, refer to Appendix Y for a map of the catchments and UDA boundary.

The stormwater systems in Takaka have been developed in conjunction with kerb and channel projects. The Takaka Stormwater Plan shows the general arrangement of the stormwater system. Stormwater runoff from the township on the Takaka River side of Commercial Street is piped to the Te Kakau Stream. The areas around Motupipi Street and Abel Tasman Drive drain into the Upper Motupipi River.

A large number of residential properties rely on soakage through to river gravels for their stormwater disposal and fluctuating groundwater levels control their effectiveness. Generally the existing township area is low lying in relationship to the adjacent Takaka River. This presents potential flooding throughout the urban area as there are no stop bank controls on the river flooding plains.

The UDA closely covers the built up area around Meihana Street, Motupipi Street and Commercial Street. The town's stormwater systems drain into the Motupipi River to the south, the Te Kakau Stream to the west (a local drainage spur in the floodplain, adjacent to the Takaka River), and into a series of natural drainage swales to the north. Much of the town overlies silty gravels with high water tables and artesian groundwater flows. Lake Killarney is located within the centre of Takaka and the water level is controlled by surrounding groundwater levels. A number of stormwater pipes drain small areas into Lake Killarney.

A formal assessment of system capacity was carried out in 1997. This investigation looked into areas of reported historical flooding and assessed the system upgrades required for pipes in those problem areas to pass a 1 in 5 year storm event.

There is currently no stormwater treatment in place.

Table B-28 shows the stormwater assets in Takaka.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Takaka currently has no resource consents.

B.11.2. Asset Capacity and Performance

B.11.2.1 Primary Flow Paths

The Stormwater Catchment Study for Takaka (MWH New Zealand Ltd, July 2006) assessed catchment capacity as follows in Table B-26.

Table B-26: Assessment of Takaka Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Return Period (years)	Proposed Return Period (years)
A: Orange Drain	Channel	14.40	0.717	1.5	5
B: Reillys	Pipes/ Channel	8.17	0.086	<1	5
C: Meihana/Waitapu	Pipes	19.11	0.044	<1	5
D: Lake Killarney	Pipes	1.42	*	*	*
E: Edinburgh	Pipes	0.55	*	*	*

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Return Period (years)	Proposed Return Period (years)
F: Waitapu	Pipes	2.14	0.040	<1	5
G: Rose	Pipes	0.99	0.045	2.5	5
H: Commercial/Hiawatha	Pipes	0.99	0.108	4.5	5
I: Hiawatha	Pipes	12.43	*	*	*
J: Tasman Milk Products	Channel	13.6	*	*	*

Source: Stormwater Catchment Study for Takaka (MWH New Zealand Ltd, July 2006)

* Not assessed

Table B-26 shows that the majority of catchments have infrastructure that is potentially undersized.

B.11.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.11.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Takaka	10	1	4	6	21

Source: Confirm

Other performance issues for Takaka UDA are:

- it is flat with very little hydraulic gradient to get good drainage and has high groundwater levels
- it is at high risk from significant flood damage from the Takaka River.

B.11.3. Asset Age and Condition

All pipe assets were installed between 1970 and 2008. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Takaka UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.11.4. Operations and Maintenance

The majority of the stormwater drainage is by soakage to river gravels and the performance is affected by high ground water levels. In addition, there are some pipes along the main commercial area that discharge into open drains to the west and east of the town. High groundwater levels also impact on the capacity of the ditches.

Details of the operation and maintenance regime are included in Appendix E.

B.11.5. Strategic Studies

Table B-27 below lists key existing strategic studies and models within the UDA.

Table B-27: Existing Strategic Studies and Models for the Takaka UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Takaka Stormwater Catchment Study	July	2006	MWH	Investigates potential long and short term options to control flooding in Takaka area.
Takaka South Stormwater Issues and Options	September	2009	MWH	Investigates issues and options for the Takaka South Outline Development Area.

B.11.6. Key Issues

The key issues for Takaka are:

- 30% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.

B.11.7. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-28: Takaka Stormwater Assets

Takaka Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Culvert	190
SW-Pipe	5,574
Grand Total	**5,764**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Culvert	**190**
0	19
150	11
300	35
375	46
450	12
600	42
1500	25
SW-Pipe	**5,574**
100	328
150	200
225	732
300	2,929
315	62
375	813
450	224
600	164
750	17
850	56
900	36
1200	13
Grand Total	**5,764**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Culvert	**190**
Concrete	48
RCRRJ	50
RCRRJ Class X	81
Unknown	11
SW-Pipe	**5,574**
Concrete	327
Novaflow	126
PVC	192
RCRRJ	1,424
RCRRJ Class X	353
Unknown	2,771
uPVC	381
Grand Total	**5,764**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Channel	4,120
Grand Total	**4,120**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Count of ASSETID
SW-Inlet	7
SW-Manhole	42
SW-Node	19
SW-Outlet	23
SW-Outlet structure	1
SW-Soakpit	5
SW-Sump	127
Grand Total	**224**

B.12 Pohara UDA

B.12.1. System Overview

Pohara UDA consists of two parts, the main Pohara settlement area and the Pohara Valley area. Both areas have been subject to much significant recent development. Much of the main Pohara settlement is made up of traditional beach frontage property but the core of recent development has focused away from the coast, inland, off Richmond Road. Pohara Valley is a settlement predominantly set back from the coast, within a gently rising valley with development off Pohara Valley Road and Haile Lane.

The catchment area is divided into five sub catchments, refer to Appendix Y for a map of the catchments and UDA boundary.

Development in both areas began close to the sea and continued into the hilly areas behind. As development has been made, a series of piped stormwater systems have been installed and with each new wave of development further additions to extend the existing stormwater systems have been made. Many of the stormwater piped systems offer a very poor level of service as a result. This is particularly the case with development that has taken place in Pohara Valley.

Road drainage is mostly open drains in both parts of the UDA and combined with piped stormwater systems.

In addition, there have been flooding problems caused by the proximity of developments over or close to existing stream channels draining the large areas of hills behind Pohara. In the main settlement of Pohara there are three major stream channels converging on the settlement from outside the UDA. One of these channels passes close-by to properties and through an area of residential development parallel to Richmond Road. In the Pohara Valley settlement two open channels both pass through areas of residential development. Each of these open channels also cross under Abel Tasman Drive before discharging into Tasman Bay.

Problems of flooding from blockages and incapacity are exacerbated through many privately owned bridge crossings and foot access crossings providing artificial restrictions to the hydraulic capacity of the streams.

MWH New Zealand Ltd completed a Stormwater Catchment Study in May 2008 which identified current flooding issues and solutions to upgrade the system.

There is currently no stormwater treatment in place.

Table B-32 shows the stormwater assets in Pohara.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Pohara currently has no resource consents.

B.12.2. Asset Capacity and Performance

B.12.2.1 Primary Flow Paths

The Stormwater Catchment Study for Pohara (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-29 and Table B-30.

Table B-29: Assessment of the Pohara Settlement Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 1.2x4m	30.5	> Q_{100}	50.4	> Q_{100}	5.84
B: 1.35m dia	3.3	Q_{10}	4.2	Q_{35}	2.79
C: 1.060m dia	2.1	Q_2	2.5	$Q_{2.3}$	3.17
D: unknown	*	*	*	*	*
E: 1.35 dia	3.3	Q_{25}	4.2	> Q_{50}	3.17

Source: Stormwater Catchment Study for Pohara (MWH New Zealand Ltd, May 2008)

* Not assessed

The table above shows that Culvert C is potentially undersized.

Table B-30: Assessment of the Pohara Valley Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 1.8x2.45	12.2	Q_{15}	15.0	Q_{50}	9.58
B: 1.2m dia	3.8	Q_2	4.9	Q_4	5.56
C: 1.2m dia	3.8	$Q_{2.3}$	4.9	Q_5	5.56
D: 1.2m dia	3.8	$Q_{2.3}$	4.9	Q_5	5.56
E: 1.2m dia	3.8	$Q_{2.3}$	4.9	Q_5	5.56
F: 0.9m dia	1.6	$Q_{<1}$	2.33	$Q_{1.5}$	4.00
G: 0.9m dia	1.6	$Q_{<1}$	2.33	$Q_{1.5}$	4.00
H: 0.9m dia	1.6	$Q_{<1}$	2.33	$Q_{1.5}$	4.00

Source: Stormwater Catchment Study for Pohara (MWH New Zealand Ltd, May 2008)

Table B-30 above shows that Culverts B, C, D, E, F, G, H are potentially undersized.

B.12.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.12.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Other	Grand Total
Pohara	3	7	10

Source: Confirm

Other performance issues for Pohara UDA are.

- The main settlement (on Richmond Road) has major issues relating to the piped reticulated stormwater system in place. The underlying ground conditions may form part of the final solution for improved groundwater soakage. Parts of the drainage area overlay limestone in which there are a number of sinkholes/tomos. This offers opportunities to make use of these as soak pits but this would require stormwater quality controls before discharging to ground. Water draining through this limestone bedrock will eventually drain out to sea from a number of resurgences.
- In the Pohara Valley area, the issue is the low level of service offered by both open water channels and the numerous restrictions to flow capacity from bridge crossings and culverts, many privately owned.
- There have been a number of flooding incidents reported in this settlement area in recent years. This was put down to possible blockages and the general lack of capacity of a number of restrictions on the channels, some which are 900mm diameter and thought to offer a level of service of around a 1 in 1 year storm event.
- In the main Pohara settlement, the level of service of Council owned culvert crossings is greater than a 1 in 20 year storm event, however two privately owned culvert crossings around Bay Vista Drive are more restrictive to flows and thought to only be able to offer a level of service less than a 1 in 5 year storm event.

B.12.3. Asset Age and Condition

All pipe assets were installed between 1990 and 2008. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Pohara UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.12.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 60% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a Resource Consent application for discharge in accordance with the TRMP.

B.12.5. Growth and Demand

Growth from new dwellings in Pohara/Tata Beach/Ligar Bay/Tarakohe townships is expected to increase by 24% over the next 20 years (Source: Volume 2 of the Growth Model - 09/08/2011).

B.12.6. Operations and Maintenance

The open water channels in both the main Pohara settlement and Pohara Valley discharge into Tasman Bay onto beach frontage through culvert crossings which pass under Abel Tasman Drive. There is no problem with the discharge point at Pohara Valley, but the culvert crossing Abel Tasman Drive in the main Pohara settlement is partly blocked with sand, significantly reducing its hydraulic capacity. There is little that can be done to clear this pipe since its invert level is below the beach level. This would need to be addressed in an overall solution to upgrade the stormwater system.

Many of the culvert crossings over the open channels require regular checking to ensure they are free from blockages.

Details of the operation and maintenance regime are included in Appendix E.

B.12.7. Strategic Studies

Table B-31 below lists key existing strategic studies and models within the UDA.

Table B-31: Existing Strategic Studies and Models for the Pohara UDA

Title	Month	Year	Author	Purpose
Pohara Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Pohara area.
Pohara Valley Stormwater	March	2009	MWH	Review of Pohara Valley catchment.

B.12.8. Key Issues

The key issues for Pohara are:

- 60% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.12.9. Capital Works

The full upgrade and development programme is included in Appendix F

Table B-32: Pohara Stormwater Assets

Pohara Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Culvert	163
SW-Pipe	3,914
Grand Total	**4,077**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Culvert	**163**
225	4
300	44
375	10
450	39
600	20
900	26
1200	21
SW-Pipe	**3,914**
0	13
100	433
150	165
200	192
225	1,226
250	50
300	1,390
375	250
450	78
525	34
900	36
1050	14
1200	15
1350	17
Grand Total	**4,077**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Culvert	**163**
Concrete	25
RCFJ Class X	47
RCRRJ	28
RCRRJ Class X	63
SW-Pipe	**3,914**
Concrete	173
Farm Tuff	57
HDPE	28
Nexus Hi-way	176
PVC	16
RCFJ	65
RCRRJ	2,192
RCRRJ Class X	578
Steel	15
Unknown	84
uPVC	530
Grand Total	**4,077**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Channel	685
Grand Total	**685**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Count of ASSETID
SW-Cleaning eye	4
SW-Inlet	3
SW-Inlet structure	9
SW-Manhole	66
SW-Node	44
SW-Outlet	14
SW-Outlet structure	6
SW-Soakpit	1
SW-Sump	130
Grand Total	**277**

B.13 Ligar Bay / Tata Beach UDA

B.13.1. System Overview

Ligar Bay and Tata Beach are similar settlements, separated by a short distance of coastline. Both are popular holiday retreats and have grown considerably in recent years. The catchments are both covered by forestry and native bush and are steep with numerous gullies, rising to approximately 300m on the ridgeline.

The catchment area for Ligar Bay is divided into four sub catchments totalling 251.49ha, refer to Appendix Y for a map of the catchments and UDA boundary. The catchment area for Tata Beach is divided into five sub catchments totalling 75.86ha, refer to Appendix Y for a map of the catchments and UDA boundary.

The original bach style properties were built close to beach frontage and development has progressed further inland and onto steeper ground. The surrounding land is predominantly native bush and these settlements lie on the edge of the Abel Tasman National Park.

There are a number of small self-contained stormwater systems (many piped) and serving various developments which have taken place of the last number of years.

There are no major issues reported for either settlement.

Local flooding issues relating to poor road drainage have been observed in Tata Beach. A stormwater pipe renewal and improvement has recently been completed in Tata Beach behind Cornwall Place.

In Ligar Bay, the properties are self-draining into open road drains with a small number of piped systems in place. The main stormwater flows come from the catchment behind the UDA with an open watercourse crossing Abel Tasman Drive on the UDA boundary.

There is currently no stormwater treatment in place.

Table B-36 shows the stormwater assets in Ligar Bay and Tata Beach.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Ligar Bay and Tata Beach currently has the following resource consents.

- RM080228: Works and structures being placed in a watercourse at 39 Cornwall Place (expires 25 August 2043).
- RM080230: Water diversion at 39 Cornwall Place (expires 25 August 2043).
- R080746: Earthworks in Land Disturbance Area 2 and Coastal Environmental Area at 39 Cornwall Place (expires 25 August 2043).

B.13.2. Strategy Asset Capacity and Performance

B.13.2.1 Primary Flow Paths

The Stormwater Catchment Study for Ligar Bay (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-33.

Table B-33: Assessment of Ligar Bay Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: Twin 900 dia	2.75	Q_2	4.40	Q_{10}	5.99
B: 900 dia	1.52	> Q_{100}	2.25	> Q_{100}	0.22
C: 1200 dia	2.26	Q_2	4.54	Q_{50}	4.53
D: Twin 900 dia	4.24	Q_{20}	5.22	> Q_{50}	4.53

Source: Stormwater Catchment Study for Ligar Bay (MWH New Zealand Ltd, May 2008)

The Stormwater Catchment Study for Tata Beach (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-34.

Table B-34: Assessment of Tata Beach Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 900 dia	1.80	Q_{20}	2.00	Q_{35}	2.29
B: 900 dia	1.80	Q_{20}	2.00	Q_{35}	2.29
C: 520 dia	0.50	Q_5	0.68	Q_{35}	0.72
D: 600 dia	0.69	Q_2	1.11	Q_5	2.00

Source: Stormwater Catchment Study for Tata Beach (MWH New Zealand Ltd, May 2008)

Table B-33 and Table B-34 above show that in Ligar Bay Culvert A is potentially undersized, and in Tata Beach Culvert D is potentially undersized.

B.13.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.13.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Health Nuisance	Other	Pipe Break/Blockage	Grand Total
Ligar Bay			1		1
Tata Beach	1	1		1	3

Source: Confirm

Other performance issues for Ligar Bay/Tata Beach UDA are:

- this is popular holiday location and an area of outstanding beauty
- the extent of flooding and flooding mechanisms is relatively unknown from historical flooding records.

B.13.3. Asset Age and Condition

All pipe assets were installed between 1986 and 2008. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Ligar Bay and Tata Beach are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.13.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 30% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.13.5. Growth and Demand

Growth from new dwellings in Pohara/Tata Beach/Ligar Bay/Tarakohe townships is expected to increase by 24% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011).

B.13.6. Operations and Maintenance

Complete regular maintenance to clear culvert crossings over open channels, particularly to the storm channel passing through Tata Beach.

Details of the operation and maintenance regime are included in Appendix E.

B.13.7. Strategic Studies

Table B-35 below lists key existing strategic studies and models within the UDA.

Table B-35: Existing Strategic Studies and Models for the Ligar Bay and Tata Beach UDA

Title	Month	Year	Author	Purpose
Ligar Bay Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Ligar Bay area.
Tata Beach Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Tata Beach area.

B.13.8. Key Issues

The key issues for Ligar Bay and Tata Beach are:

- 30% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.

B.13.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-36: Ligar Bay and Tata Beach Stormwater Assets

Ligar Bay/Tata BeachPohara Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	379
SW-Extent of feature	13
SW-Pipe	2,221
Grand Total	2,614

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	379
375	143
450	23
525	29
600	60
750	19
900	68
1050	37
SW-Extent of feature	13
0	13
SW-Pipe	2,221
100	167
150	52
225	198
300	627
375	387
450	49
525	198
600	245
750	94
825	150
900	49
1500	5
Grand Total	2,614

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	379
Concrete	53
Corrugated steel	17
RCFJ	2
RCRRJ	307
SW-Extent of feature	13
(blank)	13
SW-Pipe	2,221
Concrete	67
Corrugated steel	142
Novaflow	3
RCRRJ	961
RCRRJ Class X	518
Unknown	127
uPVC	403
Grand Total	2,614

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(blank)

Row Labels	Sum of Length
(blank)	
Grand Total	

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Count of ASSETID
SW-Inlet structure	2
SW-Manhole	24
SW-Node	13
SW-Outlet	1
SW-Outlet structure	2
SW-Soakpit	2
SW-Sump	28
Grand Total	72

B.14 Collingwood

B.14.1. System Overview

Collingwood UDA consists of a north facing high ridge bounded on the west by the Aorere River and the tidal inlet and on the east by the Tasman Bay. This steep sided ridge discharges stormwater to both the east and west sides. Most of the discharge off the high ground is through small road drains and minor open ditches.

The catchment area has not yet been defined, refer to Appendix Y for a map of the UDA boundary.

A small peninsula at the northern end of the high ground accommodates the commercial area of Collingwood and the public motor camp on the northern tip. This area is low lying and several small pipe systems discharge to the east and west sides of the peninsula. On the Tasman Bay side a large sandy section of land has effectively blocked several of the outlet systems. These have been extended in open drains and constructed pits to allow some drainage.

Recent works have redirected some flows from the easterly direction and piped these under Tasman Street to the west of the inlet at the Aorere River mouth.

The catchment is mostly residential and stormwater flows are intercepted by a combination of open drains and piped stormwater systems. The main open drain passes down Gibbs Road before discharging to sea. A number of piped systems discharge into this ditch. The remainder of the catchment is mostly served by piped stormwater systems. Along Beach Road a number of open drains, which collect stormwater from the steep sub catchment, pass through a number of culverts to discharge to sea.

There is currently no stormwater treatment in place.

Table B-38 shows the stormwater assets in Collingwood.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Collingwood currently has the following resource consent.

- RM090204 - Works and Structures being placed in a watercourse in Lewis Street (expires 04 May 2044).

B.14.2. Asset Capacity and Performance

B.14.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.14.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.14.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Other	Pipe Break/Blockage	Grand Total
Collingwood	4	5	4	13

Source: Confirm

Other performance issues for Collingwood UDA are:

- this is high profile tourist area in an area of outstanding beauty
- issues with blockages of Beach Road culverts from sand intrusion and accumulation of vegetative growth.

B.14.3. Asset Age and Condition

All pipe assets were installed between 1980 and 2008. The majority of installation dates for non-pipe assets are not recorded in Confirm but assumed to be of the same age.

Much of the residential developed area has piped stormwater systems. The condition of the existing stormwater infrastructure is not known. Large areas of the piped stormwater system are not mapped onto the Council's GIS system.

B.14.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 40% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a Resource Consent application for discharge in accordance with the TRMP.

B.14.5. Growth and Demand

Growth from new dwellings in Collingwood township is expected to increase by 24% over the next 20 years (Source: Volume 2 of the Growth Model – 9 August 2011).

B.14.6. Operations and Maintenance

There are problems maintaining stormwater outfalls along the western end of Beach Road, where the gravity outfalls through the fore dune are constantly affected by tidal movement of sand. Regular maintenance of the Beach Road outfalls to remove sand infiltration and vegetation is required.

Details of the operation and maintenance regime are included in Appendix E.

B.14.7. Strategic Studies

Table B-37 below lists key existing strategic studies and models within the UDA:

Table B-37: Existing Strategic Studies and Models for the Collingwood UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Collingwood Stormwater Catchment Study	September	2005	MWH	Investigates potential long and short term options to control flooding in Collingwood area.

B.14.8. Key Issues

The key issues for Collingwood are:

- 40% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.
- The existing system will not be able to maintain service levels at predicted levels of growth.

B.14.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-38: Collingwood Stormwater Assets

Collingwood Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Sum of Length
SW-Culvert	119
SW-Pipe	3,286
Grand Total	3,405

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Sum of Length
SW-Culvert	119
0	28
225	5
450	34
600	14
750	38
SW-Pipe	3,286
0	20
32	12
100	398
150	157
200	238
225	358
250	15
300	944
375	296
450	348
525	97
600	211
675	69
750	123
Grand Total	3,405

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Sum of Length
SW-Culvert	119
Concrete	10
RCRRJ	91
Unknown	18
SW-Pipe	3,286
Concrete	163
Glazed Earthenware	16
Polyethylene	12
PVC	296
RCRRJ	1,218
RCRRJ Class X	125
RCRRJ Class Y	8
RCRRJ Class Z	226
Unknown	664
uPVC	559
Grand Total	3,405

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(blank)

Row Labels	Sum of Length
(blank)	
Grand Total	

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Count of ASSETID
SW-Cleaning eye	3
SW-Inlet	3
SW-Inlet structure	6
SW-Manhole	32
SW-Node	9
SW-Outlet	12
SW-Outlet structure	7
SW-Pump	1
SW-Sump	55
Grand Total	128

B.15 Patons Rock UDA

B.15.1. System Overview

The main Patons Rock settlement area has a stormwater system that is more or less self-contained and independent from storm flows draining the larger catchment area.

The catchment area is divided into five sub catchments totalling 213.70ha, refer to Appendix Y for a map of the catchments and UDA boundary.

Open channel flows from the larger catchment areas discharge to sea either side of the settlement area. There are four culverts draining runoff flows from the road. Each of the culverts discharges onto the head of the sandy beach, and are each protected with a flap valve.

There is currently no stormwater treatment in place.

Table B-41 shows the stormwater assets in Patons Rock.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Patons Rock currently has the following resource consents.

- RM060706: The occupation of the costal marine area for the continued use of three existing stormwater outfall structures for a period of 31 years (expires 15 September 2037).

B.15.2. Asset Capacity and Performance

B.15.2.1 Primary Flow Paths

The Stormwater Catchment Study for Patons Rock (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-39.

Table B-39: Assessment of Patons Rock Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: Twin 1200 dia	5.8	> Q_{50}	7.9	> Q_{100}	5.36
B: 250 dia	0.08	approx. Q_2	0.10	< Q_5	0.22
C: 250 dia	0.08	approx. Q_2	0.10	< Q_5	0.15
D: 250 dia	0.08	Q_{20}	0.10	Q_{50}	0.10
E: 250 dia	0.08	Q_{20}	0.10	Q_{50}	0.10

Source: Stormwater Catchment Study for Patons Rock (MWH, May 2008)

Table B-39 above shows that Culverts B and C are potentially undersized.

B.15.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.15.2.3 Performance

Confirm has CSR records of the following issues from the period 2008 to 2011:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Patons Rock	2	1	3	2	8

Source: Confirm

Other performance issues for Patons Rock UDA are:

- this is a popular holiday location and an area of outstanding beauty
- issues with blockages of the four culverts from sand intrusion at the discharge points
- the extent of flooding and flooding mechanisms is relatively unknown from historical flooding records.

B.15.3. Asset Age and Condition

All pipe assets were installed in 1970. The installation date of non-pipe assets is not recorded in Confirm but assumed to be 1970.

Generally the assets in the Patons Rock UDA are in the early half of their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.15.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 70% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.15.5. Growth and Demand

Growth from new dwellings in Patons Rock township was not modelled. (Source: Volume 2 of the Growth Model – 9 August 2011).

B.15.6. Operations and Maintenance

Problems experienced in the past are normally related to the low coastal strip between the main road and the sea coast. This is low lying land and drainage systems are affected by coastal tidal conditions. Regular maintenance of the outfalls is required, to remove sand accumulation in front of the discharge points.

Details of the operation and maintenance regime are included in Appendix E.

B.15.7. Strategic Studies

Table B-40 following lists key existing strategic studies and models within the UDA.

Table B-40: Existing Strategic Studies and Models for Patons Rock UDA

Title	Month	Year	Author	Purpose
Patons Rock Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Patons Rock area.

B.15.8. Key Issues

The key issues for Patons Rock are:

70% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection.

B.15.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-41: Patons Rock Stormwater Assets

Patons Rock Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Sum of Length
SW-Pipe	204
Grand Total	**204**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Sum of Length
SW-Pipe	204
250	172
300	32
Grand Total	**204**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Sum of Length
SW-Pipe	204
Concrete	32
HDPE	172
Grand Total	**204**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(blank)

Row Labels	Sum of Length
(blank)	
Grand Total	

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Count of ASSETID
SW-Manhole	1
SW-Outlet	4
SW-Sump	8
Grand Total	**13**

B.16 Non-Urban Areas

B.16.1. System Overview

Non-urban areas consist of all areas that do not fall within a UDA. Assets in these areas include culverts, pipes, and channels. There is currently no stormwater treatment in place. Table B-42 shows the stormwater assets in non-urban Areas. Non-urban areas currently have no resource consents.

The confidence of this data is **reliable** (based on NZ infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

There are also a lot of private drainage channels and roadside drains which are not considered part of this activity.

B.16.1.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.16.1.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.16.1.3 Performance

Performance has not been assessed.

B.16.2. Asset Age and Condition

All assets were installed between 1960 and 2008. Generally the assets in the non-urban areas are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.16.3. Compliance with Level of Service

Non-urban areas have not been assessed.

B.16.4. Growth and Demand

Growth from new dwellings in the Tasman district is expected to increase by 28% over the next 20 years (Source: Volume 2 of the Growth Model – 09 August 2011). Refer to Appendix F for more information.

B.16.5. Operations and Maintenance

Not assessed for non-urban Areas.

Details of the operation and maintenance regime are included in Appendix E.

B.16.6. Strategic Studies

There are no existing strategic studies and models within the non-urban areas.

B.16.7. Key Issues

The key issues for non-urban Areas are:

- desired levels of service in non-urban areas has not been assessed.

B.16.8. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-42: Non-Urban Stormwater Assets

Non Urban Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	672
SW-Pipe	3,936
Grand Total	**4,608**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	**672**
150	6
200	16
225	44
300	62
375	425
450	11
600	9
750	56
900	9
1050	17
1350	16
SW-Pipe	**3,936**
0	26
100	17
150	183
200	2
225	242
250	71
300	1,521
375	741
450	501
525	62
600	258
750	161
900	89
1200	48
1600	14
Grand Total	**4,608**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	**672**
Concrete	53
PVC	6
RCRRJ	216
RCRRJ Class Y	136
RCRRJ Class Z	229
Unknown	16
uPVC	16
SW-Pipe	**3,936**
Concrete	739
HDPE	43
PVC	37
RCRRJ	1,804
RCRRJ Class X	5
RCRRJ Class Y	19
Unknown	1,240
uPVC	49
Grand Total	**4,608**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Channel	749
Grand Total	**749**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Count of ASSETID
SW-Cleaning eye	4
SW-Collection pond	1
SW-Electrical	1
SW-Inlet	19
SW-Inlet structure	17
SW-Manhole	37
SW-Miscellaneous item	4
SW-Node	77
SW-Outlet	31
SW-Outlet structure	25
SW-Pump	2
SW-Soakpit	21
SW-Sump	95
SW-Valve	2
Grand Total	**336**

APPENDIX C ASSESSMENT OF STORMWATER SYSTEMS IN THE DISTRICT

Tasman District Council performed the Water and Sanitary Services Assessments (WSSA) in 2005 and evaluated all stormwater drainage in its district. The WSSA documents consist of two volumes:

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

Volume 2: 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.

APPENDIX D ASSET VALUATIONS

D.1 Declaration of Valuation

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 and the AMP improvement plan.

The valuations summarised below have been completed in accordance with the following standards and are suitable for inclusion in the financial statements for the year ending June 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 – 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 have now moved to a two year revaluation cycle. Historic asset valuations reports are held with Council.

Council were 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 end of June 2012.

D.3 2009 Valuation - Stormwater

The stormwater assets were last re-valued in June 2009 and are reported under separate cover[6]. 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
Stormwater 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 pipe and manhole depths, 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 below.

[6] Infrastructural Asset Revaluation, June 2009 – MWH 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
Stormwater channel (open drain)	Not depreciated	
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 for stormwater assets is compared to the 2007 valuation summary in Table D-3 and Table D-4 below. Table D-5 shows the asset value by Urban Drainage Area.

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

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Stormwater Pipes	90,581,941	73,355,850	17,226,092	821,996
Stormwater Channels	2,923,919	2,923,919	-	-
Stormwater Surface features	15,774,821	12,318,118	3,456,703	201,855
Total	**109,280,681**	**88,597,886**	**20,682,794**	**1,023,851**

Table D-4: 2007 / 2009 Stormwater Valuation Comparison

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Stormwater 2007	65,589,739	53,664,244	11,925,495	582,890
Stormwater 2009	109,280,681	88,597,886	20,682,794	1,023,851
% Increase	66.61%	65.10%	73.43%	75.65%

Overall the stormwater assets have increased in optimised replacement value by 66.61% value since the 2007 revaluation. The increases are due to the following reasons:

- new and vested assets since 2007 ($871,000 which includes approximately 2km of new pipe and associated manholes and fittings)
- number of manholes and sumps has increased significantly since the 2007 valuations
- overall the Confirm database has a higher level of detail than the previous spreadsheets register used in the previous valuations, leading to a far more accurate valuation.

Table D-5: 2009 Asset Valuation by Urban Drainage Area

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Richmond	53,163,788	42,909,476	10,254,312	488,434
Brightwater	5,247,681	4,173,080	1,074,601	53,841
Wakefield	4,349,551	3,443,114	906,437	44,795
Murchison	673,932	516,813	157,119	6,921
St Arnaud	106,427	103,481	2,945	937
Tapawera	1,687,121	1,153,978	533,143	17,095
Motueka	25,051,577	19,709,527	5,342,050	246,277
Mapua / Ruby Bay	4,667,796	3,964,612	703,184	48,856
Kaiteriteri	2,789,821	2,457,650	332,171	27,705
Takaka	2,466,500	1,905,461	561,039	26,796
Pohara	728,568	685,788	42,780	8,009
Ligar Bay / Tata Beach	2,248,543	2,066,459	182,084	21,054
Collingwood	1,323,334	1,161,284	162,049	14,226
Patons Rock	84,730	45,658	39,071	1,014
Non-Urban Areas	1,767,393	1,377,584	389,809	17,893
Not identified	2,923,919	2,923,919	-	-

APPENDIX E OPERATIONS AND MAINTENANCE

E.1 Maintenance Contract

E.1.1. C688 for Stormwater Utilities Operation and Maintenance

The operation and maintenance of the stormwater systems has been incorporated into a single performance based contract. This contract also incorporates water and wastewater systems. The current maintenance contractor is Downer NZ Ltd. The initial contract duration is six years with up to an additional four years potential extension, provided the contractor meets the performance requirements of the contract. At the time of writing, this contract is in Year 4. 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. For details on routine maintenance activities and maintenance frequency please refer to C688.
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.

Plans illustrating which sections of drains/open water courses in each UDA, which is the Council's responsibility to maintain, are included at the back of this Appendix. All drains highlighted as being Council's responsibility are included in the proactive maintenance schedule (Table E-1) issued to the Councils maintenance Contractor.

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 stormwater reticulation repairs including, pipes and pump stations, some open channels, inlets, outlets, and detention dams.

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

Table E-1: Tasman District Council Stormwater Asset Maintenance List

	Waterway Name	Reach	Ownership	Start Co-ord	End Co-ord	Length	Required Routine Maintenance	Maintenance Frequency
MAINT.ID	**Richmond**							
RD001	Borcks Creek	Headingly Lane to Queen Street	Engineering	0	880	880	Tractor boom mowning	4 times yearly
RD002	Borcks Creek	Queen St to Humes Drain	Engineering	880	2540	1660	Currently not maintained	
RD003	Borcks Creek	Humes to SH 60	Engineering	2540	2840	300	Tractor boom mowning	4 times yearly
RD004	Borcks Creek	SH to Andrews Drain	Engineering	2840	3520	680	Not maintained	
RD005	Borcks Creek	Andrews to SH 6	Engineering	3520	4480	960	Mechanical hand clearing	4 times yearly
RD006	Borcks Creek	SH 6 to Ranzau Road	Engineering	4480	5300	820	Mechanical hand clearing	4 times yearly
RD007	Humes Drain	Borckes Cr to end of Railway Reserve	Engineering	2540	2980	440	Tractor boom mowning	4 times yearly
RD008	Humes Drain	Railway Reserve to SH 6 Bridge	Engineering	2980	3180	200	Mechanical hand clearing	4 times yearly
RD009	Humes Drain	SH 6 Bridge to eastern Hills Drain	Engineering	3180	3710	530	Tractor boom mowning	4 times yearly
RD010	Eastern Hills Drain	Alongside Bateup Road	Engineering	3710	4095	385	Tractor boom mowning	4 times yearly
RD011	Andrews Drain	Borcks to SH6	Engineering	3520	3750	230	Mechanical hand clearing	4 times yearly
RD012	Reservoir Creek	Waimea inlet to Salisbury Road	P & R	0	460	460	Not maintained	
RD013	Reservoir Creek	Salisbury Road to Kareti Drive	P & R	460	830	370	Not maintained	
RD014	Reservoir Creek	Kareti Dr to Templemore Road Culvert.	Engineering	830	1050	220	Chemical Spray	2 times yearly
RD015	Reservoir Creek	Templemore Culvert to Hill Street	Engineering	1050	1650	600	Mechanical hand clearing	4 times yearly
RD016	Jimmy Lee Creek	Washbourn Drive to Bill Wilkes Reserve	Engineering	0	370	370	Desilt and Mechanical hand clearing	2 times yearly
RD017	Jimmy Lee Creek	Bill Wilkes Reserve to Hunter Avenue	Engineering	370	578	208	Desilt and Mechanical hand clearing	2 times yearly
RD018	Beach Rd Drain	Waimea inlet to Lammas Street	Engineering	0	890	890	Desilt and Chemical Spray	2 times yearly
RD026	Railway Yard Drain	Railway Reserve to Queen St behind Railway Hotel	Engineering	0	436	436	Desilt and Mechanical hand clearing	2 times yearly
RD019	Cemetery Dam	Otia Drive	Engineering				Maintain and clear grates. Mow	12 times yearly
RD020	Blair Terrace Detention area	Blair Terrace	Engineering				Maintain and clear grates.	12 times yearly
RD021	Blair Tce Inlet Structure	21B Blair Terrace	Engineering				Maintain and clear grates.	12 times yearly
RD022	Lodestone Road Detention Dam	14 Lodestone Road	Engineering				Maintain and clear grates.	12 times yearly
RD023	Bill Wilkes Reserve Inlet Structures	20 Wasbourn Drive	Engineering				Maintain and clear grates.	12 times yearly
RD024	Marlborough Crescent Inlet Structure	Tasman District Council Reserve Easby Park	Engineering				Maintain and clear grates.	12 times yearly
RD025	Olympus Way Detention Dam	43 Olympus Way	Engineering				Maintain and clear grates.	12 times yearly
					TOTAL	**10639**		
	Motueka							
MOT001	Thorp Drain	Tudor St to 136 Thorp St	Engineering	0	140	140	Mechanical hand clearing	2 times yearly
MOT002	Woodlands Drain	Supermarket to end of Thorps Bush	Engineering	0	410	410	Mechanical hand clearing	2 times yearly
MOT003	Woodlands Drain	Thorp Bush to Old Wharf Road	Engineering	410	1360	950	Tractor boom mowning	2 times yearly
MOT004	Woodlands Drain	Old Wharf Road to detention estuary	Engineering	1360	1620	260	Mechanical hand clearing	2 times yearly
MOT005	Queen Victoria Drain	Between Whakarewa St and Pah Street	Engineering	0	290	290	Tractor boom mowning	4 times yearly
MOT006	Lammas drain 2		Engineering	0	390	390	Mechanical hand clearing	2 times yearly
MOT007	14 Outfalls		Engineering				Inspect inlet and keep clear	12 times yearly
MOT008	Wharf Road Flood Gate	Wharf Road	Engineering				Inspect and carry out regular maintenance	4 times yearly
MOT009	Old Wharf Road Flood Gate	Old Wharf Road	Engineering				Inspect and carry out regular maintenance	4 times yearly
MOT010	Glenaven Avenue Motueka	Glenaven Ave Motueka	Engineering				Maintain and clear grates.	12 times yearly
					TOTAL	**2440**		
	Brightwater							
BGW001	Jeffries Creek	Eder Property Lord Rutherford Rd South	Private	0	130	130	Mechanical hand clearing if required	2 times yearly

	Waterway Name	Reach	Ownership	Start Co-ord	End Co-ord	Length	Required Routine Maintenance	Maintenance Frequency
BGW002	Jeffries Creek	Hill Property Lord Rutherford Road South	Private	130	280	150	Mechanical hand clearing if required	2 times yearly
BGW003	Jeffries Creek	Bashford property to Lord Rutherford Road South	Private	300	440	140	Mechanical hand clearing if required	2 times yearly
BGW004	Ellis Street Drain	96 Ellis Street to School		0	50	50	Hand Clear or Excavator clean	2 times yearly
BGW005	Ellis Street Drain	Ellis Street to Brightwater Engineers	Engineering	50	265	215	Hand Clear or Excavator clean	2 times yearly
BGW006	Railway Reserve Drain	Brightwater Engineers to Wairoa River	Engineering	265	765	500	Mow	2 times yearly
					TOTAL	**1185**		
	Wakefield							
WK001	Eighty Eight Valley drain	72A Eighty Eight valley Road to 88 Valley Stream	Engineering	0	240	240	Mechanical hand clearing	2 times yearly
WK002	Domain Drain (Faulkners Bush to 39 Eighty Eight Valley Road		Engineering	390	1020	630	Hand Clear or Excavator clean	2 times yearly
WK003	88 Valley Dam	Eden property 88 Valley Road	Engineering				Maintain and clear grates.	12 times yearly
					TOTAL	**870**		
	Mapua							
MAP001	Morley Drain	to Mapua inlet	Engineering	0	410	410	Hand Clear or Excavator clean	2 times yearly
MAP002	Crusader Drive Dam	21 Crusader Drive Dam	Engineering				Maintain and clear grates.	12 times yearly
					TOTAL	**410**		
	Ruby Bay							
RUB001	Brabant Drive/Pine Hill Road	Culvert outlet to beach	Engineering				Inspect outlet and keep clear	6 times yearly
RUB002	4 Crusader Drive	Culvert inlet and outlet drain to detention area	Engineering				Inspect inlet and keep clear	4 times yearly
RUB003	Tait Street outlet	Culvert outlet to beach	Engineering				Inspect inlet and keep clear	12 times yearly
RUB004	Broadsea Avenue outlet	Culvert outlet to beach	Engineering				Inspect inlet and keep clear	12 times yearly
	Kaiteriteri							
KAI001	Little Kaiteriteri Reserve Drain	Rowling Road opposite Kotare Place	Engineering	0	200	200	Hand Clear or Excavator clean	4 times yearly
KAI002	Little Kaiteriteri outlet	Rowling Road	Engineering				Maintain and clear grates.	4 times yearly
KAI003	Camp Beach outlet pipe	Kaiteriteri Sandy Bay Road alongside boat ramp	Engineering				Inspect and clear culvert	12 times yearly
					TOTAL	**200**		
	Takaka							
TAK001	Reilly	Reilly Rd to Te kaka Strm	Engineering	0	170	170	Hand Clear or Excavator clean	2 times yearly
TAK002	Orange and others	Motupipi St to Motupipi River	Engineering	0	330	330	Hand Clear or Excavator clean	2 times yearly
					TOTAL	**500**		
	Pohara							
POH001	Watino Place	Picks up new subdivision and runs to Richmond Road behind properties.	Engineering	0	178	178	Hand Clear or Excavator clean	2 times yearly
					TOTAL	**178**		
	Tata Beach							
TAT001	Abel Tasman Drive	Tata Heights to Peterson Road	Engineering	0	325	325	Hand Clear or Excavator clean	2 times yearly
TAT002	Cornwall Place	Inlet/culvert and open drain	Engineering	0	160	160	Inspect, clear vegetation	2 times yearly
					TOTAL	**485**		
	Collingwood							
COL001	Ruataniwha Drive	Open drain between 34 and 38	Engineering	0	85	85	Spray, hand clear and maintain rock	2 times yearly
COL002	Lewis Street Drain		Engineering	0	115	115	Mechanical hand clearing	1 times yearly
COL003	Beach Road	Five stormwater outlets to beach	Engineering					6 times yearly
COL004	Gibbs Road	Open Drain Gibbs Road North	Engineering	0	195	195	Spray or desilt drain	2 times yearly
					TOTAL	**395**		

	Waterway Name	Reach	Ownership	Start Co-ord	End Co-ord	Length	Required Routine Maintenance	Maintenance Frequency
	Murchison							
MUR001	Neds Creek	70m North and South of Cromwell Street	Engineering	1070	1210	140	Mechanical hand clearing	2 times yearly
MUR002	Neds Creek	Cromwell Street 70m South toward George Street	Engineering	1140	1210	70	Mechanical hand clearing	2 times yearly
					TOTAL	**210**		
	Riwaka							
RIW001	School Road tide gates	School Road and Lodder Lane intersection	Engineering				Inspect inlet/outlets and keep clear	12 times yearly
RIW002	Lodders Lane Outfall	Terry Frys property	Engineering				Inspect inlet/outlets and keep clear	6 times yearly
	Tapawera							
TAP001	Cut off drain	Diversion drain above Tapawera to Western side of the township	Engineering	0	**1860**	**1860**	Inspect, hand clear and excavator clean/rock repairs.	2 times yearly
TAP002	Grass swale	Motueka Highway to Kowhai Street	P & R	0	**380**	**380**	Clear road crossing screens	4 times yearly
TAP003	Matai Crescent inlets	4 culvert inlets at the rear of Matai Crescent	Engineering				Inspect, clear vegetation	6 times yearly
					TOTAL	**2240**		
	Patons Rock							
PAT001	Patons Rock Road	4 culvert outlets to beach	Engineering				Inspect, clear vegetation and sand	12 times yearly
	General District							
					TOTAL	**19752**		

The contractor also carries out pre-storm checks on the following assets (Table E-2) to ensure the risk of flooding is minimised.

Table E-2: Flood Inspection Locations

Met Service Warning Checks	Waterway Name	Location	Asset Type	Ownership	Inspection Activity
	Richmond				
Y	Blair Terrace	21B Blair Terrace.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Marlborough Crescent	Easby Park - Tasman District Council Reserve.	Inlet Structure	Engineering	Inspect and clear debris
Y	Cemetery Dam	Otia Drive	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Lodestone Road	14 Lodestone Road.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Bill Wilkes Reserve	20 Washbourn Drive.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Jimmy Lee Creek under Washbourn Drive	20 Washbourn Drive.	Culvert Inlet Structure	Engineering	Inspect and clear debris
Y	Washbourn Dam	15 Washbourn Drive in Washbourn Gardens.	Detention Dam, Spillway and Inlet Structure	P & R	Inspect and clear debris
Y	Olympus Way	43 Olympus Way.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
	Brightwater				
Y	Brightwater sale yards	Check inlets to stormwater system running through sale yards to school grounds.	Inlet Structure	Engineering	Inspect and clear debris
	Wakefield				
Y	88 Valley Dam	Eden property, 88 Valley Road.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
	Motueka				
Y	Glenaven Avenue Motueka	Glenaven Avenue Motueka.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Wharf Road Flood Gate	Wharf Road.	Floodgate	Engineering	Inspect and clear debris

Met Service Warning Checks	Waterway Name	Location	Asset Type	Ownership	Inspection Activity
Y	Old Wharf Road Flood Gate	Old Wharf Road.	Floodgate	Engineering	Inspect and clear debris
	Ruby Bay				
Y	Aranui Road	Outlet by Fruitgrowers Chemical Site.	Outlet Flapgate	Engineering	Inspect and clear debris
Y	Crusader Drive Dam	21 Crusader Drive Dam.	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Broadsea Avenue outlet	Culvert outlet to beach.	Outlet Flapgate in Manhole	Engineering	Inspect and clear debris
	Pohara				
Y	Paradise Way	Pohara.	Detention area and Culvert inlet	P & R	Inspect and clear debris
	Tata Beach				
Y	Cornwall Place	39 Cornwall Place system inlet grate (walk-on access only).	Inlet Structure	Engineering	Inspect and clear debris
	Patons Rock				
Y	Patons Rock Road	4 culvert outlets to beach.	Beach Outlets	Engineering	Inspect and clear sand build up.
	Collingwood				
Y	Elizabeth Street, Gibbs Road	System and grates from the bottom section of Gibbs Road through to the outlet on Elizabeth Street.	Inlet, Sumps and Beach Outlet	Engineering	Inspect and clear debris.
Y	Gibbs Road	New inlet structure outside 45 and 53 Gibbs Road.	SW system Inlet	Engineering	Inspect and clear debris.
Y	Swiftsure Street	System grate and culverts on Swiftsure Street.	Culverts and Grate	Engineering	Inspect and clear debris.
18 Sites					

E.1.2. Transportation Contracts

Some sumps and culverts are transportation assets and do not fall under the stormwater operations and maintenance contract.

There are four transportation contracts that operate in the district.

- Golden Bay Roading Maintenance Contract.
- Tasman Roading Maintenance Contract.
- Waimea Roading Maintenance Contract.
- Murchison Roading Maintenance Contract.

The road maintenance contracts allow for sump and culvert cleaning in order to protect transportation assets from flooding. Refer to the Transportation Activity Management Plan for more information.

E.2 Maintenance Standards

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

- this Activity Management Plan
- 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 customers.

E.2.2. Increase in Network Size through Development

When new developments such as subdivisions are constructed any new stormwater assets constructed by the developer must be accepted as being built to Council standards. Once vested as Council assets they are included in the stormwater 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

MWH (Council's Professional Services Consultant) manages the Operations Contract C688 on behalf of Council. 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 requiring engineering consultancy professional services have been allocated to the Operations and Maintenance Budget. These are summarised in the Table E-3 below. A detailed financial forecast is shown in Table E-4.

Table E-3: Summary of Engineering Studies included in this AMP

Study Name	Brief Description
AMP Improvement Plan Activities	Annual allowance.
AMP Review and Update	Three yearly reviews (20 year forecast).
Assessments of Water and Sanitary Services	LGA 2002 requirement (stormwater component), review from time to time.
Asset Safety Review	ID and record in Confirm any assets that are dangerous, recommend repairs or monitoring.
CCTV	Continue with CCTV programme.
Land Acquisition Project	Land acquisition strategy and agreements for long term maintenance of open channels, in particular the Thorpe Drain.
Policy Statement on private bridges	Project to address health and safety issues with third party bridges.
Receiving Environment Baseline Study	Detail of study to be defined by CMPs, but to establish existing in-stream and coastal values of receiving environments. Richmond done, Y1 Motueka (30K), Y2 Brightwater and Wakefield (40K), Y3 Takaka (20K), rest 10K each.
Resource Consent monitoring	Resource consent monitoring.
Stormwater Bylaw	Develop Stormwater Bylaw in conjunction with next Bylaw Review due by 1 July 2018.
Valuations	Two yearly reviews.

E.4 Forecast Operations and Maintenance Expenditure

Downer NZ Ltd was consulted during the update of this Plan. They provided input to the identification of operational trends incorporated in these forecasts.

The twenty-year forecasts for operations and maintenance costs are shown in Table E-5.

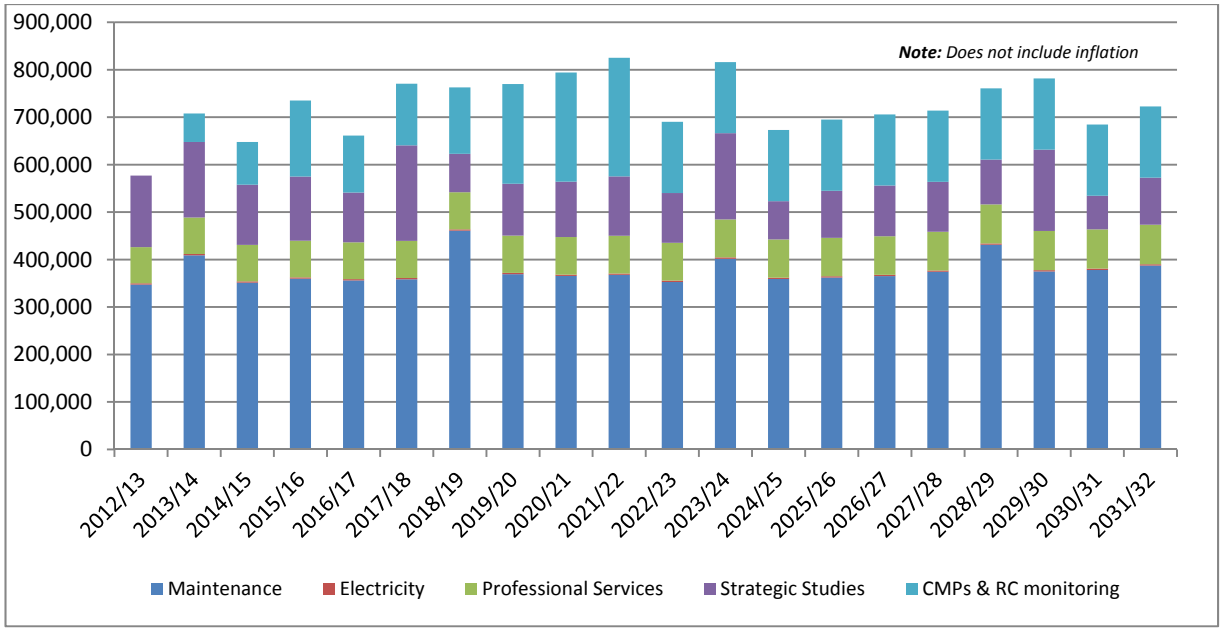


Figure E-1: 2012-2032 Stormwater Operational and Maintenance Expenditure

Table E-4: 2012-2032 Stormwater Engineering Strategic Studies Expenditure

Item	Scheme	Project Name	GL Code	Description	Project Estimate	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
97	Strategic Study	AMP Improvement Plan Activities	6002203001	Annual allowance	$ 1,015,000	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ 50,750	$ -
96	Strategic Study	AMP Review and Update	601220310	3 yearly reviews (20yr forecast)	$ 384,000	$ -	$ 24,000	$ 36,000	$ -	$ 24,000	$ 36,000	$ -	$ 24,000	$ 36,000	$ -	$ 24,000	$ 36,000	$ -	$ 24,000	$ 36,000	$ -	$ 24,000	$ 36,000	$ -	$ 24,000	$ -
95	Strategic Study	Assessments of Water and Sanitary Services	6002203002	LGA 2002 requirement (stormwater component), review from time to time	$ 90,000		$ -	$ -	$ 30,000	$ -	$ -		$ -	$ -	$ 30,000	$ -	$ -		$ -	$ -	$ 30,000	$ -	$ -		$ -	$ -
92	Strategic Study	Asset Safety Review	NEW	ID and record in Confirm any assets that are dangerous, recommend repairs or monitoring.	$ 10,000	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
60	Strategic Study	Brightwater Catchment Management Plan	NEW	Catchment Management Plan ($60K) and RC monitoring (10K/year)	$ 220,000	$ -	$ -	$ -	$ 60,000	$ 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	$ -
112	Strategic Study	CCTV	6002203010	Continue with CCTV programme	$ 400,000	$ 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	$ 20,000	$ 20,000	$ -
120	Strategic Study	Collingwood Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 170,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -
59	Strategic Study	Data Capture	NEW	Locate and record in Confirm/GIS all outlets to open channels	$ 10,000	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
116	Strategic Study	Kaiteriteri Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 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	$ -
87	Strategic Study	Land Acquisition Project	NEW	Land acquisition strategy and agreements for long term maintenance of open channels, in particular the Thorpe Drain	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
119	Strategic Study	Ligar Bay/Tata Beach Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 180,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -
114	Strategic Study	Mapua/Ruby Bay Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 240,000	$ -	$ 60,000	$ 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	$ -
75	Strategic Study	Update hydraulic model	NEW	update existing hydraulic model	$ 50,000	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
63	Strategic Study	Murchison Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 180,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -
98	Strategic Study	O&M Contract Tender	6002203006	Retender allowance	$ 182,700	$ -	$ -	$ -	$ -	$ -	$ 62,118	$ -	$ -	$ -	$ -	$ -	$ 60,291	$ -	$ -	$ -	$ -	$ -	$ 60,291	$ -	$ -	$ -
121	Strategic Study	Patons Rock Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 160,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -
118	Strategic Study	Pohara Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 190,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 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	$ -
61	Strategic Study	Policy Statement on private bridges	NEW	Project to address H&S issues with third party bridges	$ 20,000	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
110	Strategic Study	Prof Services Contract Retender	6002203008	Retender allowance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
111	Strategic Study	Receiving Environment Baseline Study	6002203009	Detail of study to be defined by CMPs, but to establish existing in-stream and coastal values of receiving environments. Richmond done, Y1 Mot (30K), Y2 B'water&W'field (40K), Y3 Takaka (20K), rest 10K ea.	$ 190,000	$ 30,000	$ 40,000	$ 20,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
86	Strategic Study	St. Arnaud Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 160,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -
81	Strategic Study	Stormwater Bylaw	NEW	Develop Stormwater Bylaw in conjunction with next Bylaw Review due by 1/7/2018	$ 18,000	$ -	$ -	$ -	$ -	$ -	$ 18,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
117	Strategic Study	Takaka Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 230,000	$ -	$ -	$ 60,000	$ 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	$ -
84	Strategic Study	Tapawera Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 170,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ -
115	Strategic Study	Tasman Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 210,000	$ -	$ -	$ -	$ -	$ 60,000	$ 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	$ -
99	Strategic Study	Valuations	6002205	2 yearly reviews	$ 45,000	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -	$ 4,500	$ -
a	Strategic Study	Wakefield Catchment Management Plan	NEW	Catchment Management Plan and RC monitoring	$ 220,000	$ -	$ -	$ -	$ 60,000	$ 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	
b	Strategic Study	Richmond RC monitoring	NEW	RC monitoring	$ 180,000	$ -	$ -	$ 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	
c	Strategic Study	Motueka RC monitoring	NEW	RC monitoring	$ 180,000	$ -	$ -	$ 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	$ -
					5,314,700																				
					Annual Totals	150,750	219,250	216,750	295,250	224,750	331,368	220,750	319,250	346,750	375,250	254,750	331,541	230,750	249,250	256,750	255,250	244,750	321,541	220,750	249,250	-

Note: Does not include inflation

Table E-5: 2012-2032 Stormwater Operation and Maintenance Expenditure

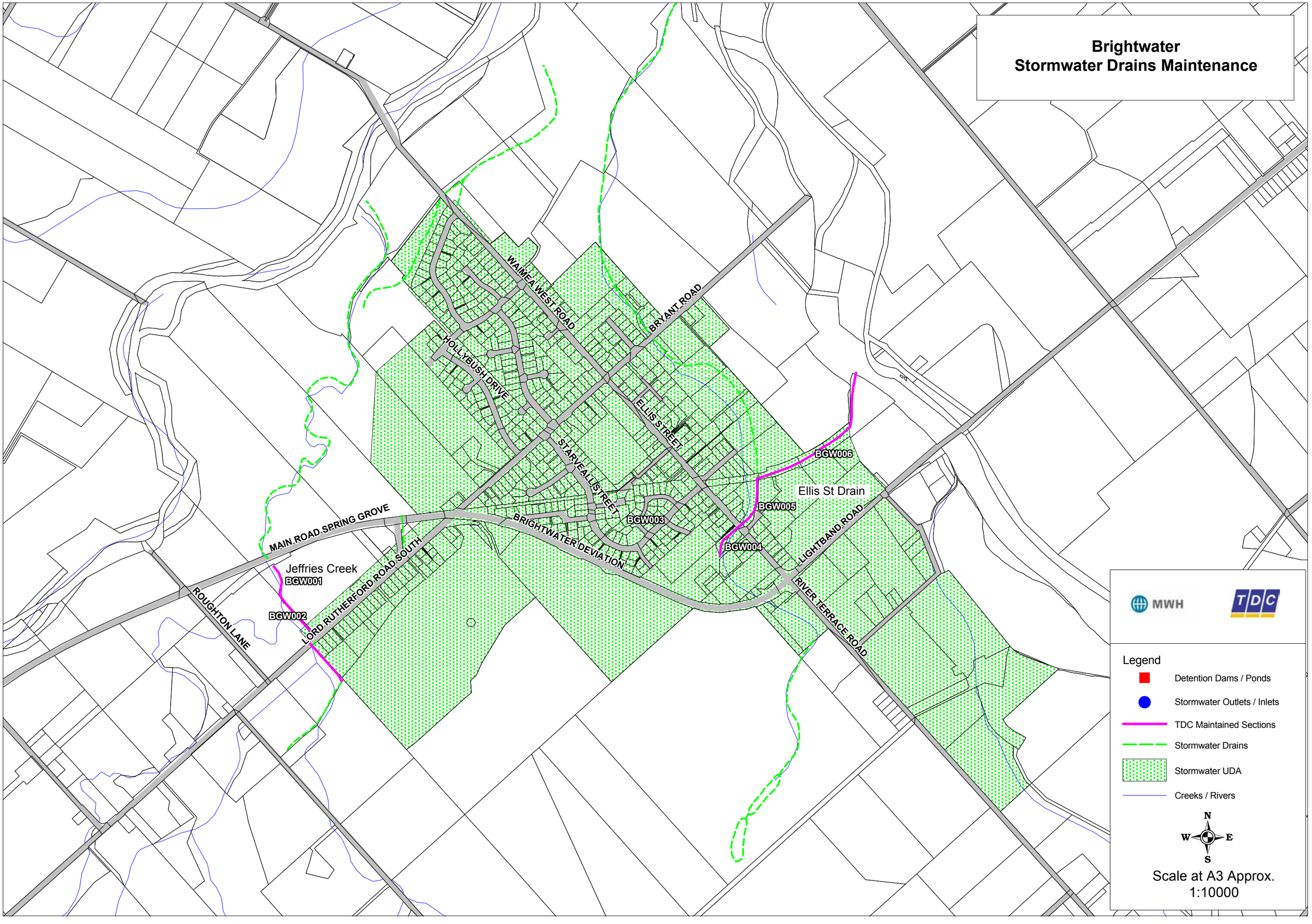
General Ledger Code	STORMWATER GENERAL OPERATING & MAINTENANCE	Growth Area	Total Over 20 yrs	2011/12 Budget	2012/13 Year 1	2013/14 Year 2	2014/15 Year 3	2015/16 Year 4	2016/17 Year 5	2017/18 Year 6	2018/19 Year 7	2019/20 Year 8	2020/21 Year 9	2021/22 Year 10	2022/23 Year 11	2023/24 Year 12	2024/25 Year 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
Maintenance																								
0601 2401	STO RICHMOND GEN MTCE	Richmond	1,569,711	70,617.97	71,324.15	71,724.78	72,125.40	72,823.27	73,521.13	74,218.99	74,916.85	75,614.72	76,312.58	77,062.14	78,099.88	79,151.61	80,217.49	81,297.73	82,392.52	83,502.04	84,626.51	85,766.13	86,921.09	88,091.60
0601 2401 01	STO RR SCHEDULED MAINT	Richmond	0	-																				
0601 2401 02	STO RR PROACTIVE MAINTENANCE	Richmond	0	-																				
0601 2401 03	STO RICHMOND - Harriet Court land purchase	Richmond - PURCHASED NO LONGER REQUI	0		-	-	-	-	-	-	-	-	-	-	-									
			0	-																				
0602 2401	STO MOTUEKA GEN MTCE	Motueka	1,149,278	48,180.83	53,662.64	54,095.94	54,512.58	55,012.54	55,512.50	56,012.46	56,512.43	57,012.39	57,512.35	58,028.98	58,228.97	58,429.64	58,631.01	58,833.06	59,035.82	59,239.28	59,443.43	59,648.29	59,853.86	60,060.13
0602 2401 01	STO MOT SCHEDULED MAINTENANCE	Motueka	0	-																				
0602 2401 02	STO MOT PROACTIVE MAINT	Motueka	0	-																				
			0	-																				
0603 2401	STO MAPUA/RUBY BAY GEN MTCE	Mapua Ruby Bay	627,471	27,588.44	27,864.33	28,139.91	28,384.87	28,782.93	29,150.37	29,548.43	29,915.87	30,313.94	30,712.00	31,048.82	31,453.01	31,862.45	32,277.23	32,697.41	33,123.05	33,554.24	33,991.04	34,433.53	34,881.78	35,335.86
0603 2401 01	STO MAPUA SCHEDULED MAINT	Mapua Ruby Bay	0	-																				
0603 2401 02	STO MAPUA PROACTIVE MAINT	Mapua Ruby Bay	0	-																				
			0	-																				
0604 2401	STO BRIGHTWATER GEN MTCE	Brightwater	238,816	10,095.07	10,196.02	10,350.51	10,489.55	10,690.38	10,875.76	11,061.14	11,246.52	11,431.91	11,617.29	11,756.32	11,955.61	12,158.27	12,364.37	12,573.97	12,787.11	13,003.87	13,224.31	13,448.48	13,676.45	13,908.28
0604 2401 01	STO BRIGHTWATER SCH MAINTENANC	Brightwater	0	-																				
0604 2401 02	STO BGW PROACTIVE MAINTENANCE	Brightwater	0	-																				
			0	-																				
0605 2401	STO WAKEFIELD GEN MTCE	Wakefield	222,894	10,176.17	10,277.93	10,323.01	10,368.09	10,458.25	10,533.38	10,623.54	10,698.67	10,773.80	10,848.93	10,909.03	11,048.78	11,190.31	11,333.66	11,478.84	11,625.88	11,774.81	11,925.65	12,078.41	12,233.14	12,389.84
0605 2401 01	STO WAKEFIELD SCH MAINTENANCE	Wakefield	0	-																				
0605 2401 02	STO WAKEFIELD PROACTIVE MAINT	Wakefield	0	-																				
			0	-																				
0606 2401	STO TAKAKA GEN MTCE	Takaka	228,952	11,334.25	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59	11,447.59
0606 2401 01	STO TAKAKA SCH MAINTENENCE	Takaka	0	-																				
0606 2401 02	SCH TAKAKA PROACTIVE MAINTENAN	Takaka	0	-																				
			0	-																				
0607 2401	STO MURCHISON GEN MTCE	Murchison	203,003	10,049.66	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15	10,150.15
0607 2401 01	STO MURCH SCH MAINTENANCE	Murchison	0	-																				
0607 2401 02	STO MURCH PROACTIVE MAINT	Murchison	0	-																				
			0	-																				
0610 2401	STO GENERAL DISTRICT MTCE	General District	1,386,870	64,929.18	65,578.47	65,989.31	66,400.15	66,789.74	67,179.33	67,568.92	67,958.51	68,348.10	68,737.69	69,127.28	69,519.07	69,913.09	70,309.34	70,707.84	71,108.59	71,511.62	71,916.93	72,324.54	72,734.46	73,146.70
0610 2401 02	STO GENERAL PROACTIVE MAINT	General District	211,482	-	10,000.00	10,062.65	10,125.30	10,184.71	10,244.11	10,303.52	10,362.93	10,422.34	10,481.75	10,541.15	10,600.90	10,660.98	10,721.41	10,782.17	10,843.28	10,904.74	10,966.55	11,028.70	11,091.21	11,154.07
			0	-																				
0621 2401	STO COLLINGWOOD GEN MTCE	Collingwood	138,155	23,671.03	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	63,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74	3,907.74
0621 2401 02	STO COLLINGWOOD - outlet maintenance	Collingwood	30,000		-	-	-	6,000.00	-	-	-	6,000.00	-	-	-	6,000.00	-	-	-	-	6,000.00	-	-	6,000.00
			0	-																				
0622 2401	STO KAITERI GEN MTCE	Kaiteriteri	125,100	6,080.18	6,140.99	6,140.99	6,140.99	6,153.94	6,153.94	6,153.94	6,166.90	6,166.90	6,166.90	6,179.85	6,210.95	6,242.20	6,273.60	6,305.17	6,336.89	6,368.78	6,400.82	6,433.03	6,465.39	6,497.92
			0	-																				
0623 2401	STO ST ARN GEN MTCE	St Arnaud	120,595	5,965.57	6,025.22	6,025.22	6,025.22	6,025.22	6,025.22	6,025.22	6,025.22	6,025.22	6,025.22	6,025.22	6,026.87	6,028.51	6,030.16	6,031.81	6,033.46	6,035.11	6,036.75	6,038.40	6,040.05	6,041.70
			0	-																				
06242401	LIGAR BAY UDA	Pohara/Tata/Ligar/Tarakohe	157,191	7,569.14	7,644.83	7,644.83	7,644.83	7,644.83	7,644.83	7,644.83	7,644.83	7,644.83	7,644.83	7,644.83	7,720.61	7,797.14	7,874.43	7,952.49	8,031.32	8,110.93	8,191.33	8,272.53	8,354.53	8,437.34
06262401	TATA BEACH UDA	Pohara/Tata/Ligar/Tarakohe	134,735	3,784.57	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,617.67	6,683.27	6,749.51	6,816.42	6,883.99	6,952.22	7,021.14	7,090.74	7,161.02	7,232.01
06272401	PATONS ROCK UDA	Pohara/Tata/Ligar/Tarakohe	224,559	10,813.06	10,921.19	10,921.19	10,921.19	10,921.19	10,921.19	10,921.19	10,921.19	10,921.19	10,921.19	10,921.19	11,029.45	11,138.78	11,249.19	11,360.70	11,473.31	11,587.04	11,701.90	11,817.89	11,935.04	12,053.35
06282401	TAPAWERA UDA	Tapawera	325,361	5,406.53	5,460.60	65,499.32	5,960.59	5,960.59	5,960.59	5,960.59	45,960.59	5,960.59	5,960.59	5,960.59	6,010.60	46,061.04	6,447.57	6,501.68	6,556.23	6,611.25	66,666.73	7,226.17	7,286.81	7,347.96
06292401	TASMAN UDA	Mapua Ruby Bay	122,966	5,406.53	5,460.60	5,514.60	5,562.61	5,640.61	5,712.62	5,790.63	5,862.64	5,940.65	6,018.66	6,084.66	6,163.87	6,244.11	6,325.40	6,407.74	6,491.15	6,575.65	6,661.25	6,747.97	6,835.81	6,924.80
06312401	POHARA UDA	Pohara/Tata/Ligar/Tarakohe	134,735	6,487.84	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,552.71	6,617.67	6,683.27	6,749.51	6,816.42	6,883.99	6,952.22	7,021.14	7,090.74	7,161.02	7,232.01
		Subtotal	7,351,874	328,156.03	329,167.89	391,043.18	333,272.27	341,699.11	338,045.90	340,444.33	442,804.07	351,187.48	347,570.88	349,900.99	352,809.39	401,750.17	359,059.38	362,068.93	365,112.10	374,189.30	431,300.97	374,951.03	378,137.14	387,359.06
Electricity																								
06022505	MOTUEKA ELECTRICITY	Motueka	45,718	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88	2,285.88
06042505	BRIGHTWATER UNDERPASS	Brightwater	10,706	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30	535.30
		Subtotal		2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18	2,821.18
Professional Services																								
06012203	STO RICH P/S CONSULTANTS	Richmond	343,765	20,568.60	16,289.04	16,380.54	16,472.55	16,565.07	16,658.12	16,751.69	16,845.78	16,940.40	17,035.56	17,131.24	17,227.47	17,324.23	17,421.54	17,519.40	17,617.81	17,716.76	17,816.28	17,916.35	18,016.99	18,118.19
06022203	STO MOT P/S CONSULTANTS	Motueka	269,690	15,757.87	12,479.25	12,580.01	12,681.59	12,783.99	12,887.21	12,991.27	13,096.17	13,201.91	13,308.51	13,415.97	13,524.30	13,633.50	13,743.59	13,854.56	13,966.43	14,079.20	14,192.88	14,307.49	14,423.01	14,539.47
06032203	STO MAPUA P/S CONSULTANTS	Mapua Ruby Bay	126,799	7,279.35	5,764.79	5,821.80	5,879.38	5,937.53	5,996.25	6,055.56	6,115.45	6,175.93	6,237.01	6,298.69	6,360.99	6,423.90	6,487.43	6,551.60	6,616.39	6,681.83	6,747.91	6,814.65	6,882.05	6,950.11
06042203	STO BGW P/S CONSULTANTS	Brightwater	100,166	5,461.68	4,325.31	4,390.84	4,457.37	4,524.90	4,593.46	4,663.06	4,733.71	4,805.44	4,878.25	4,952.16	5,027.19	5,103.36	5,180.68	5,259.18	5,338.86	5,419.76	5,501.87	5,585.24	5,669.86	5,755.77
06052203	STO WAKEFIELD P/S CONSULTANTS	Wakefield	90,207	5,461.68	4,325.31	4,344.28	4,363.33	4,382.47	4,401.69	4,420.99	4,440.38	4,459.86	4,479.42	4,499.07	4,518.80	4,538.62	4,558.53	4,578.52	4,598.60	4,618.77	4,639.03	4,659.37	4,679.81	4,700.34
06062203	STO TAKAKA P/S CONSULTANTS	Takaka	86,506	5,461.68	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31	4,325.31
06102203	STO GEN P/S CONSULTANTS	General District	482,845	30,304.68	23,999.41	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76	24,149.76
06212203	STO COLLINGWOOD P/S CONSULTANT	Collingwood	30,776	1,943.11	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82
06222203	STO KAITERI P/S CONSULTANT	Kaiteriteri	30,776	1,943.11	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82
06232203	STO ST ARN P/S CONSULTANT	St Arnaud	30,776	1,943.11	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82	1,538.82
		Subtotal	1,592,308.11	96,124.86	76,124.86	76,608.99	76,945.74	77,285.48	77,628.26	77,974.09	78,323.01	78,675.06	79,030.27	79,388.66	79,750.27	80,115.14	80,483.30	80,854.78	81,229.61	81,607.84	81,989.50	82,374.62	82,763.24	83,155.39
Strategic Studies	lookup row	3		SW2008	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0601220311	AMP Improvement Plan Activities	Annual allowance	1,015,000	50,000.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00	50,750.00
0601220310	AMP Review and Update	3 yearly reviews (20yr forecast)	384,000	40,000.00	-	24,000.00	36,000.00	-	24,000.00	36,000.00	-	24,000.00	36,000.00	-	24,000.00	36,000.00	-	24,000.00	36,000.00	-	24,000.00	36,000.00	-	24,000.00
06002203001	Assessments of Water and Sanitary Services	LGA 2002 requirement (stormwater component), review from time to time	90,000	-	-	-	-	30,000.00	-	-	-	-	-	30,000.00	-	-	-	-	-	30,000.00	-	-	-	-
06002203012	Asset Safety Review	ID and record in Confirm any assets that are dangerous, recommend repairs or monitoring.	10,000		-	-	-	10,000.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06002203010	CCTV	Continue with CCTV programme	400,000	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
06002203013	Data Capture	Locate and record in Confirm/GIS all outlets to open channels	10,000		-	-	-	10,000.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06002203015	Land Acquisition Project	Land acquisition strategy and agreements for long term maintenance of open channels, in particular the Thorpe Drain	10,000		-	-	-	-	-	-	-	-	-	10,000.00	-	-	-	-	-	-	-	-	-	-
06002203006	O&M Contract Tender	Retender allowance	182,700	60,000.00	-	-	-	-	-	62,118.00	-	-	-	-	-	60,291.00	-	-	-	-	-	60,291.00	-	-
06002203014	Policy Statement on private bridges	Project to address H&S issues with third party bridges	20,000		-	20,000.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06002203009	Receiving Environment Baseline Study	Detail of study to be defined by CMPs, but to establish existing in-stream and coastal values of receiving environments. Richmond done, Y1 Mot (30K), Y2 B'water&W'field (40K), Y3 Takaka (20K), rest 10K ea.	190,000	40,000.00	30,000.00	40,000.00	20,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	-	-	-	-	-	-	-
06002203016	Stormwater Bylaw	Develop Stormwater Bylaw in conjunction with next Bylaw Review due by 1/7/2018	18,000		-	-	-	-	-	18,000.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06002203017	Update Hydraulic Model	update existing hydraulic model	50,000		50,000.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06002205	Valuations	2 yearly reviews	45,000	-	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00	-	4,500.00
		Subtotal	2,424,700	210,000.00	150,750.00	159,250.00	126,750.00	135,250.00	104,750.00	201,368.00	80,750.00	109,250.00	116,750.00	125,250.00	104,750.00	181,541.00	80,750.00	99,250.00	106,750.00	105,250.00	94,750.00	171,541.00	70,750.00	99,250.00
CMPs & RC monitoring				lookup row	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0602220301	Brightwater Catchment Management Plan	General District	220,000		-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0621220301	Collingwood Catchment Management Plan	General District	170,000		-	-	-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0622220301	Kaiteriteri Catchment Management Plan	General District	200,000		-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0624220301	Ligar Bay/Tata Beach Catchment Management Plan	General District	180,000		-	-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0603220301	Mapua/Ruby Bay Catchment Management Plan	General District	240,000		-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
06022605	Motueka RC monitoring		180,000		-	-	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00

Ledger Code	GENERAL OPERATING & MAINTENANCE	Growth Area	Over 20 yrs	Budget	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
0607220301	Murchison Catchment Management Plan	General District	180,000		-	-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0627220301	Patons Rock Catchment Management Plan	General District	160,000		-	-	-	-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0631220301	Pohara Catchment Management Plan	General District	190,000		-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
06012605	Richmond RC monitoring		180,000		-	-	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0623220301	St. Arnaud Catchment Management Plan	General District	160,000		-	-	-	-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0606220301	Takaka Catchment Management Plan	General District	230,000		-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0628220301	Tapawera Catchment Management Plan	General District	170,000		-	-	-	-	-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0629220301	Tasman Catchment Management Plan	General District	210,000		-	-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
0605220301	Wakefield Catchment Management Plan	General District	220,000		-	-	-	60,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
		Subtotal	2,890,000.00	-	-	60,000.00	90,000.00	160,000.00	120,000.00	130,000.00	140,000.00	210,000.00	230,000.00	250,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00
		Grand Total	**14,258,881.68**	**637,102.07**	**558,863.93**	**689,723.35**	**629,789.19**	**717,055.77**	**643,245.33**	**752,607.60**	**744,698.26**	**751,933.72**	**776,172.33**	**807,360.83**	**690,130.84**	**816,227.49**	**673,113.86**	**694,994.89**	**705,912.89**	**713,868.33**	**760,861.65**	**781,687.83**	**684,471.56**	**722,585.64**

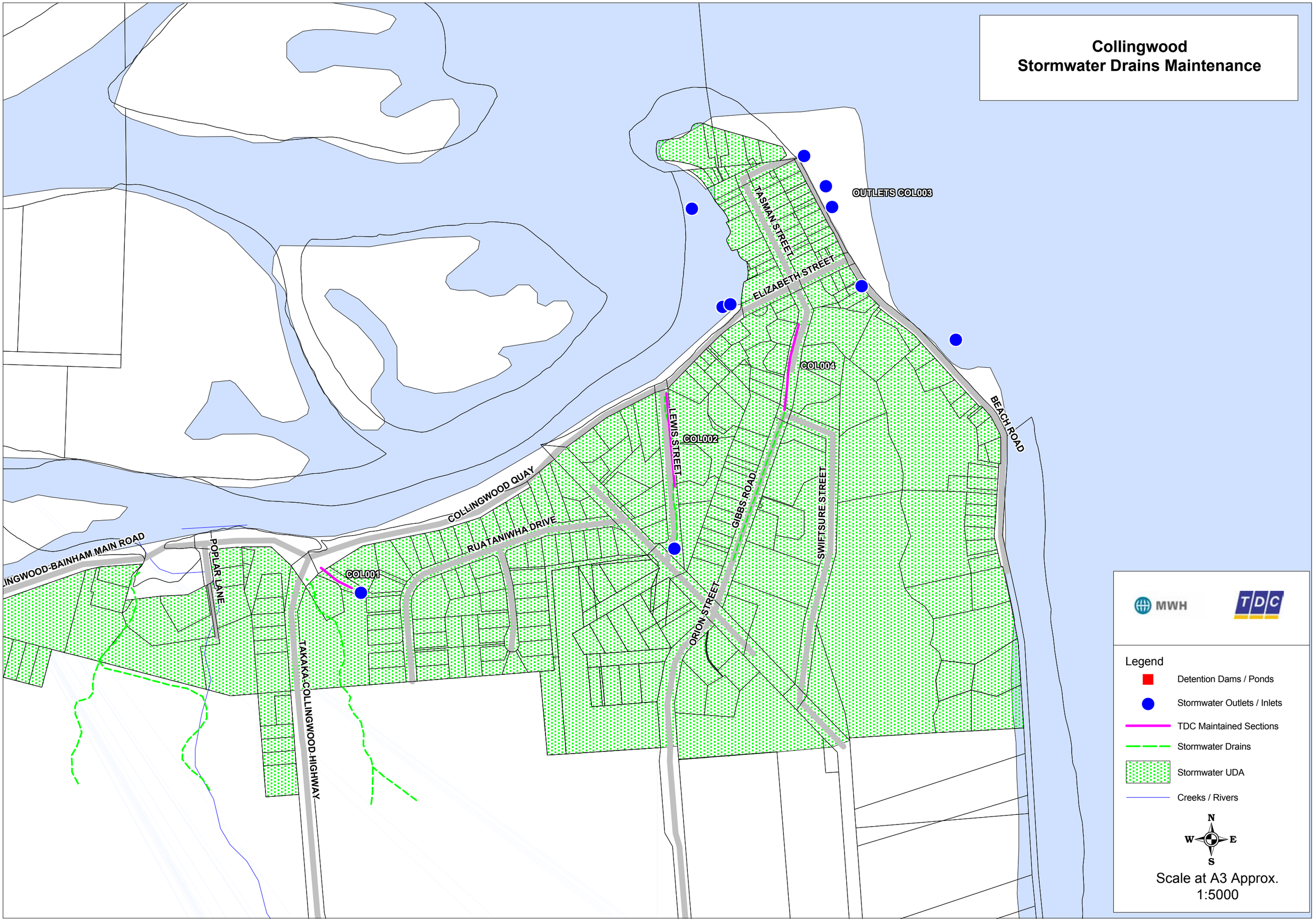
NB Harriet Court (row 8) has now been purchased. No longer required

Note: Does not include inflation

Brightwater
Stormwater Drains Maintenance



Collingwood
Stormwater Drains Maintenance



Kaiteriteri
Stormwater Drains Maintenance

KAITERITERI-SANDY BAY ROAD

Camp Beach Outlet
KAI003

INLET ROAD

MARTIN FARM ROAD

KAI001

Little Kaiteri Outlet
KAI002

RIWAKA-KAITERITERI ROAD

KOTARE PLACE

TALISMAN HEIGHTS

STEPHENS BAY ROAD

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:10000

Mapua
Stormwater Drains Maintenance

SEE DETAIL

TAIT ST OUTLET

RUB002

RUB003

BROADSEA AVENUE

POMONA ROAD

CRUSADER DRIVE

MAP002

BROADSEA AVE CHAMBER

RUB004

STAFFORD DRIVE

SEATON VALLEY ROAD

Seaton Valley Drain

ARANUI ROAD

Morley Drain

MAP001

THE COASTAL HIGHWAY

HIGGS ROAD

TORU STREET

IWA STREET

ITAHI STREET

MAPUA ARANUI RD OUTLET

DETAIL

BRABANT DRIVE

PINE HILL ROAD

THE COASTAL HIGHWAY

RUB001

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N

W E

S

Scale at A3 Approx.
1:10000

Murchison
Stormwater Drains Maintenance

FAIRFAX STREET

HAMPDEN STREET

HOTHAM STREET

MUR001

MUR002

FAIRFAX STREET

Open drain maintenance
2 times per year

Murchison has a local drain care group
that also does clearance and tidy up work.

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:10000

Patons Rock
Stormwater Drains Maintenance

Patons Rock Beach Outlet

Patons Rock Beach Outlet

OUTLETS PAT001

PATONS ROCK ROAD

Patons Rock Beach Outlet

Patons Rock Beach Outlet

BAY VIEW TERRACE

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:2500

Richmond
Stormwater Drains Maintenance

HEADINGLY LANE
RD001
Borcks Creek
MCSHANE ROAD
QUEEN STREET
RD002
BEACH ROAD
RD013 Beach Road Drain
RICHMOND DEVIATION
MAIN ROAD STOKE
RD012
Reservoir Creek
RD018
CHAMPION ROAD
Railway Yard
RD026
SALISBURY ROAD
RD014
RD015
APPLEBY HIGHWAY
RD003
GLADSTONE ROAD
LOWRY STREET
QUEEN STREET
TALBOT STREET
Humes Drain
RD007
Borcks Creek
CRESCENT STREET INLET
Washbourne Gardens
RD008
RD004
Blair Tce Detention Dam
RD020
RD021
WASHBOURNE GRILL
RD023
HILL STREET
RD009
Cemetery Dam
RD019
RD016
RD011
Reg Andrews Drain
BILL WILKES SCREEN
RD023
RD005
MAIN ROAD HOPE
Bill Wilkes Reserve
RD017
EASBY PARK GRILL
RD024
RD010
Olympus Way Detention Dam
RD025
Jimmy Lee Creek
LODESTONE RD GRILL
WHITE ROAD
RD006
PATON ROAD
HART ROAD
Lodestone Road Detention Dam
RD022
RANZAU ROAD EAST
HILL STREET

MWH
TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:20000

Riwaka
Stormwater Drains Maintenance

RIW001

School Rd Floodgates
Check & Clear Monthly

RIW002

Lodder Lane Outfall
Check & Clear two monthly

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:10000

Takaka
Stormwater Drains Maintenance

WAITAPU ROAD
ROTOTAI ROAD
MEIHANA STREET
HIAWATHA LANE
ROSE ROAD
TMP Drain
Reilly Drain
TAK001
REILLY STREET
MOTUPIPI STREET
Orange & others Drain
TAK002
WILLOW STREET

MWH
TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:10000

Pohara
Stormwater Drains Maintenance

SELWYN STREET

ABEL TASMAN DRIVE

POH001

POHARA VALLEY ROAD

Paradise Way Outlet & Detention Dam

RICHMOND ROAD

ABEL TASMAN DRIVE

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N

W E

S

Scale at A3 Approx.
1:10000

Motueka
Stormwater Drains Maintenance

STAPLES STREET
STAPLE ST OUTLET
MOT006
Lammas Drain No.2
PARKER STREET
FEARON STREET
Lammas Drain No.1
OUTLETS MOT007
POOLE STREET
PAH STREET
GREENWOOD STREET
THORP STREET
HIGH STREET
Queen Victoria Drain
MOT005
WHAKAREWA STREET
MOT002
MOT001
Thorpe Drain
MOTUEKA QUAY
MOTUEKA QUAY OUTLET 4
MOT003
Woodland Drain
GLENHAVEN DR DETENTION DAM
GLENAVEN DRIVE
MOT010
QUEEN VICTORIA STREET
KING EDWARD STREET
OLD WHARF RD GATE
MOT009
MOT004
MOTUEKA QUAY OUTLET 1
HIGH STREET
TREWAVAS STREET
WHARF ROAD
WHARF RD GATES
MOT008

MWH
TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:20000

Tapawera
Stormwater Drains Maintenance

TAP001

Diversion drain requires regular inspection and clearance 2 times a year.

TOTARA STREET

TADMOR VALLEY ROAD

Grass swale

RATA AVENUE

Inlet screens under roads require clearance 4 times a year.

TAP002

KOWHAI STREET

MATAI CRESCENT

TAP003

3 Culvert inlets along this boundary that require regular 3 times a year clean.

MAIN ROAD TAPAWERA

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:5000

Ligar Bay / Tata Beach
Stormwater Drains Maintenance

CORNWALL PLACE
TAT002
TATA HEIGHTS
TAT001
PENINSULA ROAD
ABEL TASMAN DRIVE
NYHANE DRIVE

MWH

TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W E
S

Scale at A3 Approx.
1:10000

Wakefield
Stormwater Drains Maintenance

PIGEON VALLEY ROAD
LORD AUCKLAND ROAD
WHITBY ROAD
WHITBY ROAD
CLIFFORD ROAD
EDWARD STREET
PITFURE ROAD
EDWARD STREET
TREETON PLACE
WK002
Faulkners Bush Drain
WK001
Eighty Eight Vly Drain
EIGHTY EIGHT VALLEY ROAD
Eden Detention Dam
WK003

MWH
TDC

Legend

- Detention Dams / Ponds
- Stormwater Outlets / Inlets
- TDC Maintained Sections
- Stormwater Drains
- Stormwater UDA
- Creeks / Rivers

N
W
E
S

Scale at A3 Approx.
1:10000

APPENDIX F DEMAND AND NEW FUTURE CAPITAL REQUIREMENTS

F.1 Growth Supply – Demand Model

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. As a result of the recession and general slowdown in development since 2008, Council has adopted the Statistics NZ "medium" projection for all SAs (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 subregional demand catchment of Nelson-Tasman, and at Motueka as the centre of the western subregional 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 Stormwater 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.

Table F-2: Summary Forecast Stormwater Connections inside Urban Drainage Areas

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 20
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	
Brightwater	652	660	670	679	692	704	716	728	740	752	761	890
Collingwood	652	652	652	652	652	652	652	652	652	652	652	652
Kaiteriteri	474	474	474	474	475	475	475	476	476	476	477	501
Ligar Bay	96	96	96	96	96	96	96	96	96	96	96	96
Mapua Ruby Bay	902	910	919	927	940	952	965	977	990	1,003	1,014	1,146
Motueka	3,195	3,220	3,246	3,271	3,301	3,331	3,361	3,391	3,421	3,451	3,482	3,602
Murchison	262	262	262	262	262	262	262	262	262	262	262	262
Patons Rock	63	63	63	63	63	63	63	63	63	63	63	63
Pohara	343	343	343	343	343	343	343	343	343	343	343	377
Richmond	5,489	5,519	5,550	5,581	5,635	5,689	5,743	5,797	5,851	5,905	5,963	6,766
St Arnaud	366	366	366	366	366	366	366	366	366	366	366	367
Takaka	449	449	449	449	449	449	449	449	449	449	449	449
Tapawera	140	141	142	143	143	143	143	143	143	143	143	155
Tasman	57	57	57	57	57	57	57	57	57	57	57	57
Tata Beach	153	153	153	153	153	153	153	153	153	153	153	153
Wakefield	681	684	687	690	696	701	707	712	717	722	726	819
Total	***13,974***	***14,049***	***14,129***	***14,206***	***14,323***	***14,436***	***14,551***	***14,665***	***14,779***	***14,893***	***15,007***	***16,355***
General district	9,200	9,258	9,316	9,374	9,429	9,484	9,539	9,594	9,649	9,704	9,759	

F.2.2. Effects of Population Growth on Stormwater Flows

The link between population growth and stormwater flows is not as direct as it is for other activities, however generally population growth leads to intensification of development (infill housing), new subdivisions, and urban development.

Development work can lead to quicker and higher runoff from rainfall as paved surfaces increase. Projections for future increases in stormwater flows must take into account additional flows not only from new developments but also from existing developed areas.

Potential effects from increased population growth on the stormwater systems are:

- increased flooding due to urbanisation; faster and higher runoff flows will exceed capacities of existing systems.
- deteriorating stormwater quality due to increasing urbanisation is strongly linked to reductions in stormwater quality with potential adverse effects on the receiving environment.

F.2.3. Implications of Changes in Community Expectations

Increasing demand for higher levels of flood protection and decreasing tolerance of flooding is becoming a topical issue in some areas. Particularly areas on the outskirts of UDAs (which do not contribute financially to the upkeep of the UDA) are demanding flood protection. Focused community consultation and network capacity assessments will be required prior to extending UDA boundaries further or allowing private assets to be vested in Council.

Higher environmental standards and greater community awareness are likely to require continued reductions in the environmental related effects of the operation of stormwater systems. This is expected to necessitate on-going capital and operational expenditure to improve catchment management practices. The following initiatives are currently being implemented (or considered) by Council:

- sediment management plans for construction projects (silt pond requirements for developers)
- management of contaminants associated with urban runoff in the urban areas (sump filters, ponds and wetlands, and routine monitoring of receiving waters)
- management of point source contamination risk from commercial and industrial areas
- public education programmes.

Levels of Service are reviewed every three years in association with the review of this Activity Management Plan and the Council's LTP. Community expectations are taken into account and undergo community consultation in association with the LTP.

Capital works identified to meet the Levels of Service are summarised in the Capital Works Programme below. Refer to Appendix R for further information on Levels of Service.

F.2.4. Implications of Technological Change

Technological change can reduce or increase the demand for stormwater services. It has been assumed that the predicted technological changes will not have a significant effect on the assets in the medium term. However, relevant examples are:

- new or more sustainable urban drainage design in subdivision development
- new or different treatment processes that provide a higher quality and more reliable discharge quality
- better technology to measure flood flows and analyse system performance
- better technology to rehabilitate pipelines (trenchless technology etc.).

F.2.5. Implications of Legislative Change

In the past three years there have not been any significant changes to legislation impacting on this activity.

F.3 Assessment of New Capital Works

During May to July 2011, a number of workshops with the project team (including Asset Managers, consultants and operations and maintenance stuff) 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/database 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.

Operations:	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[7].
Renewals:	significant work that restores or replaces an existing asset towards its original size, condition, or capacity[8].
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.

[7] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114
[8] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114

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.

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.5 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.6 Developer Created Assets

Private developers generally construct new subdivisions with consent from the Council. It is very seldom that the Council itself constructs 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.7 Forecast of New Capital Work Expenditure

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 Table F-3 following and summarised in Figure F-1 following.

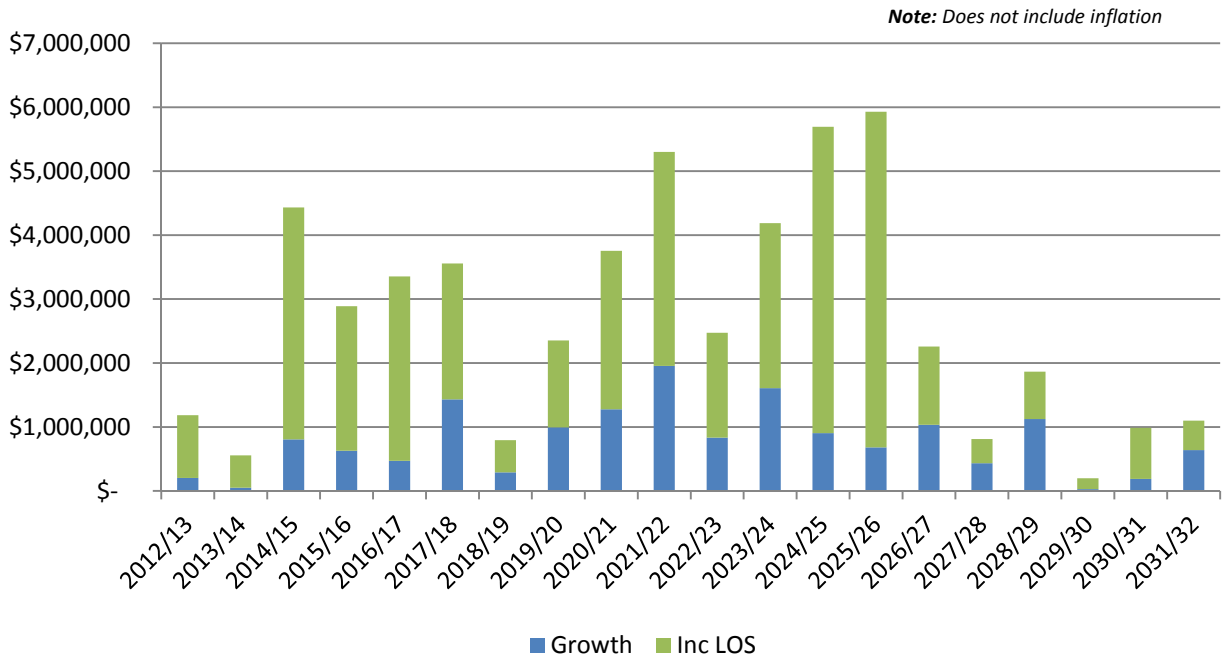


Figure F-1: 2012 – 2032 Stormwater New Capital Expenditure – by Driver

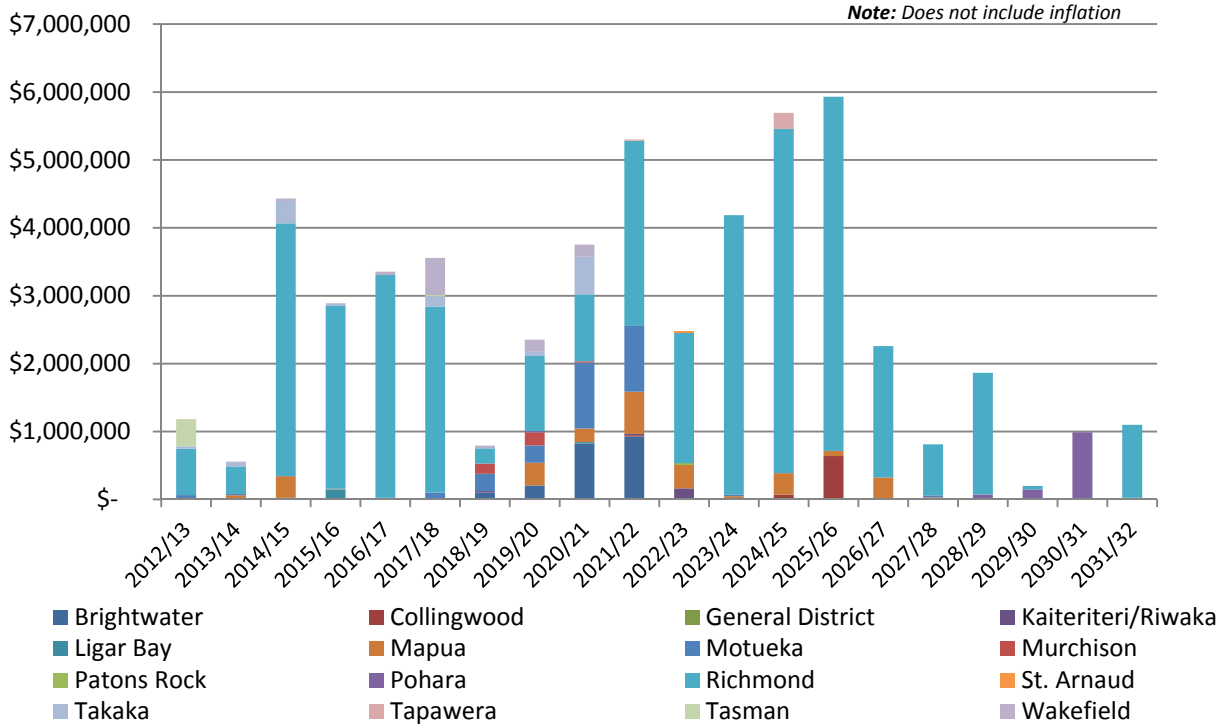
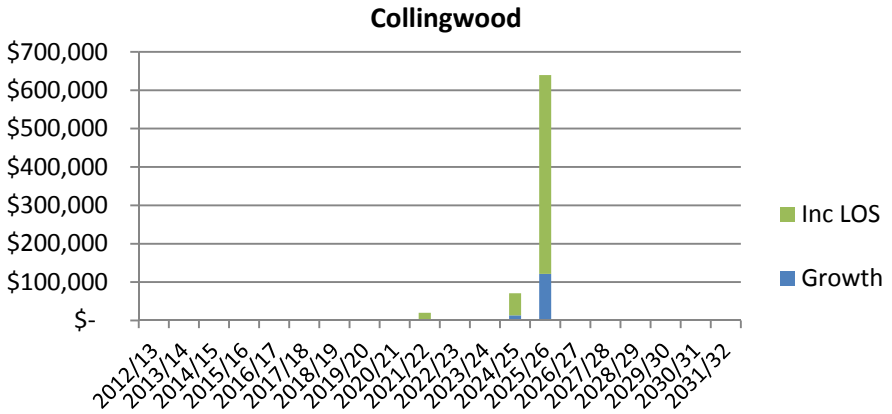
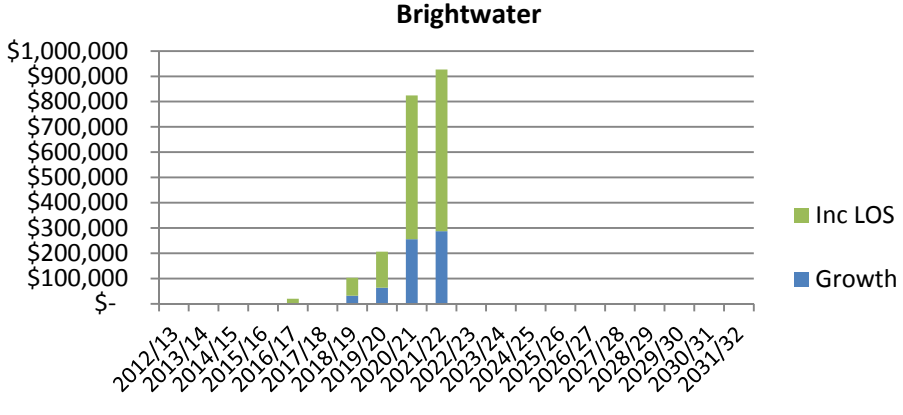


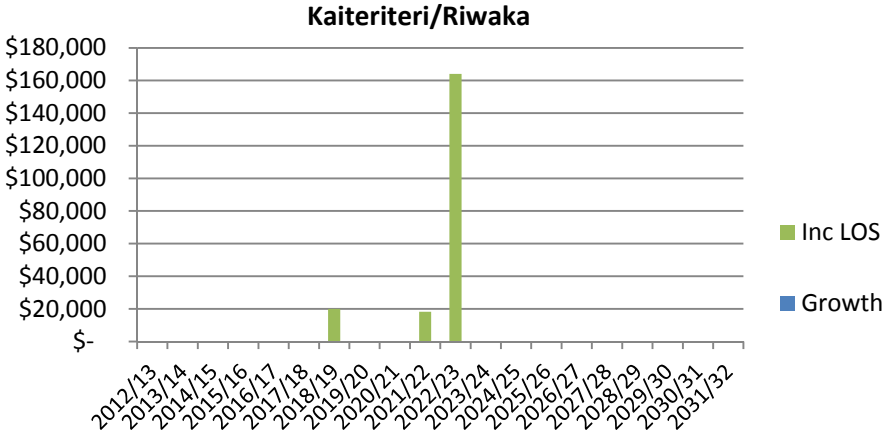
Figure F-2: 2012 – 2032 Stormwater New Capital Expenditure – by Scheme



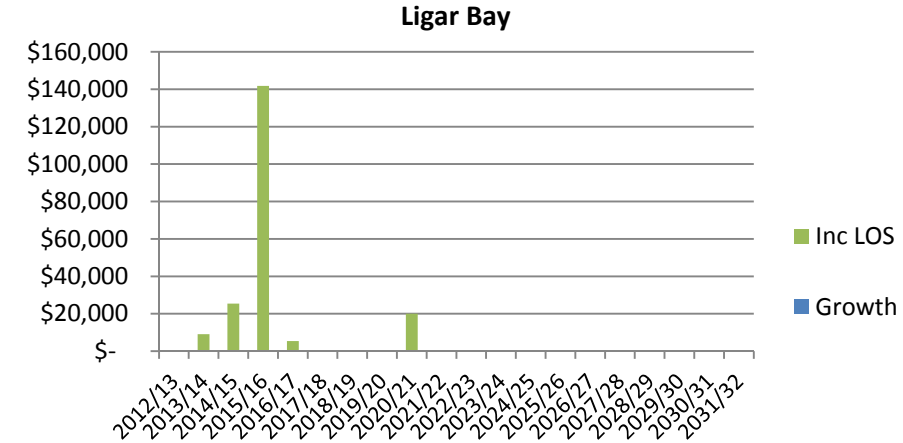
Major Capital Works:
- Gibbs Road Diversion (2024-2026)



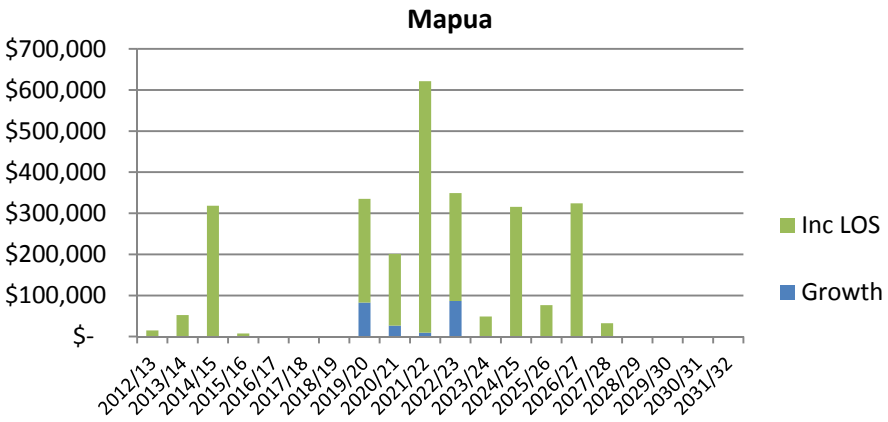
Major Capital Works:
- Mt Heslington Drain Diversion (2018-2022)



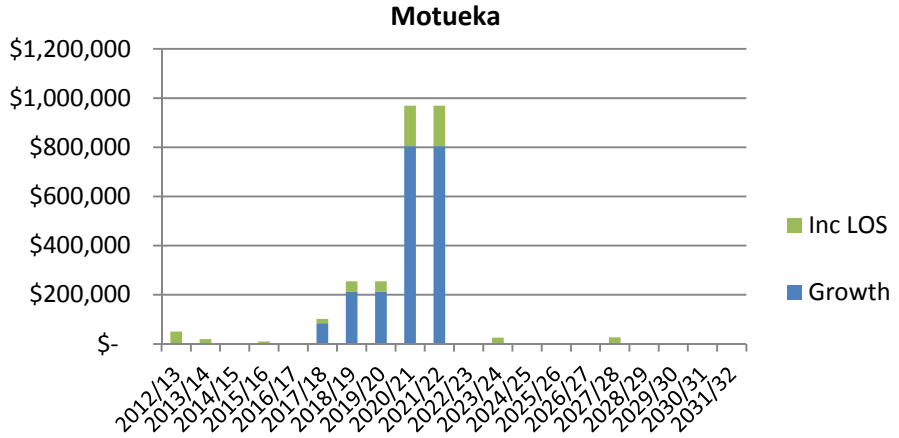
Major Capital Works:
- Motorcamp Outlet Pipe (2021-2023)



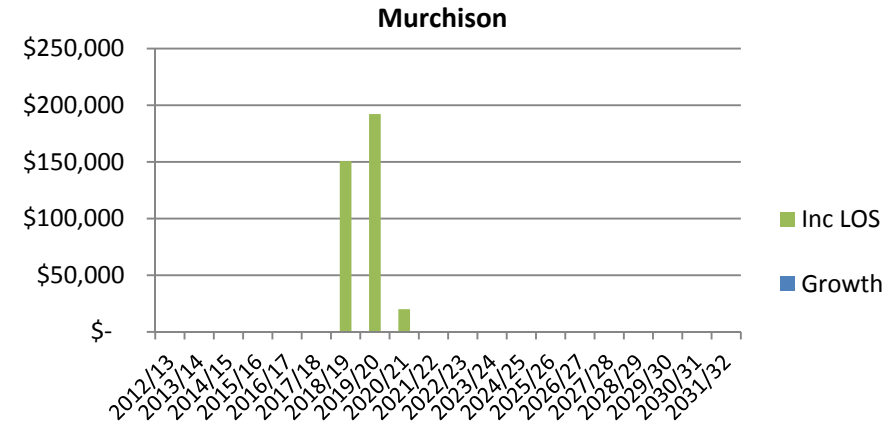
Major Capital Works:
- Abel Tasman Drive Culvert (2013-2017)



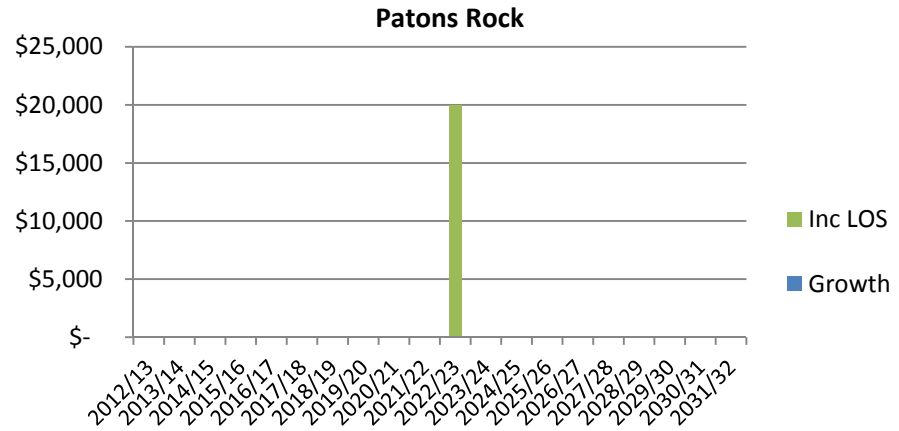
Major Capital Works:
- Seaton Valley Stream Stage 1 (2012-2016)
- Seaton Valley Stage 2 (2022-2026)
- Pomona Road/Stafford Drive (2019-2023)
- Crusader Drive (2019-2023)



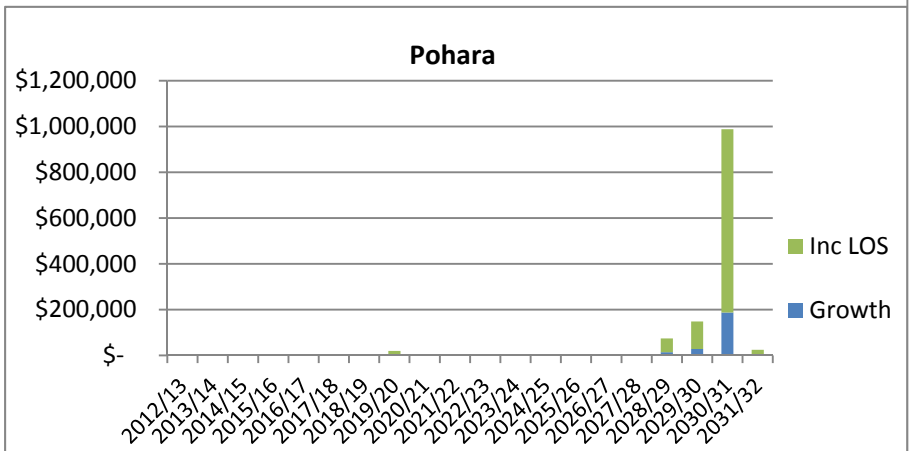
Major Capital Works:
- New Development Areas (2017-2022)



Major Capital Works:
- Recreation Centre (2019/20)
- Pipe Renewals (2018/19)

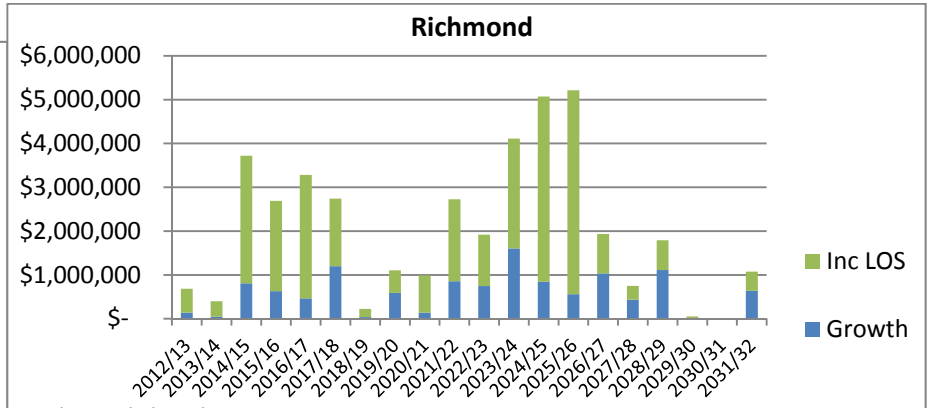


Major Capital Works:
- No major Capital Works



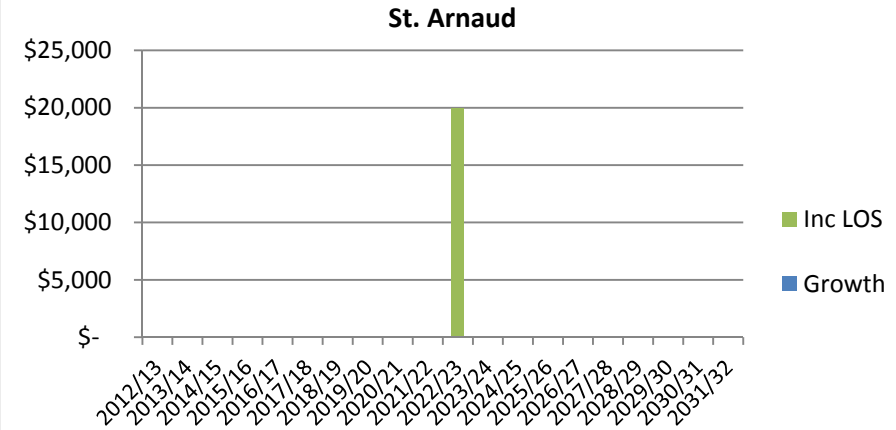
Major Capital Works:

- Pohara Main Settlement (2028-2032)



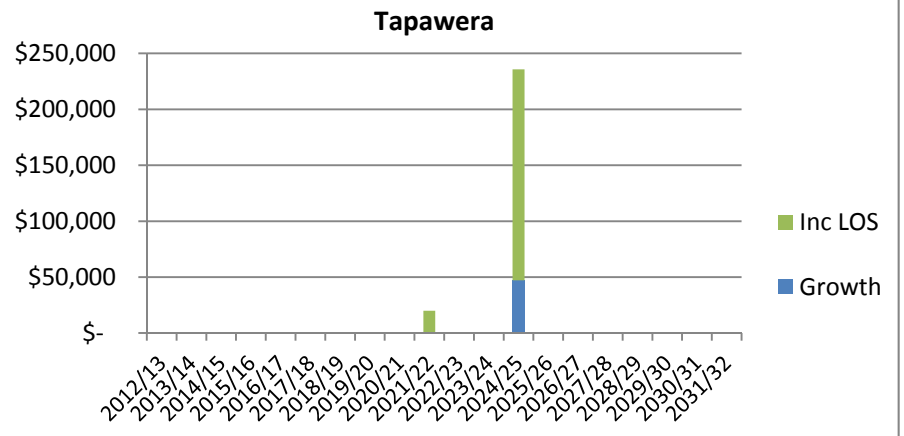
Major Capital Works:

- Hill Street (2020-2022)
- Queen Street (2012-2018)
- Beach Road (2022-2026)
- Oxford Street (2024-2026)
- Middlebank Drive (2014-2019)
- Reservoir Creek Dam (2012-2013)
- Ranzau rd/Paton Rd/White Rd (2012-2017)
- Park Drive (2018-2021)
- Poutama Drain (2012-2016)
- Borcks Creek (2014-2032)



Major Capital Works:

- No major Capital Works



Major Capital Works:

- Totara Street (2024/25)

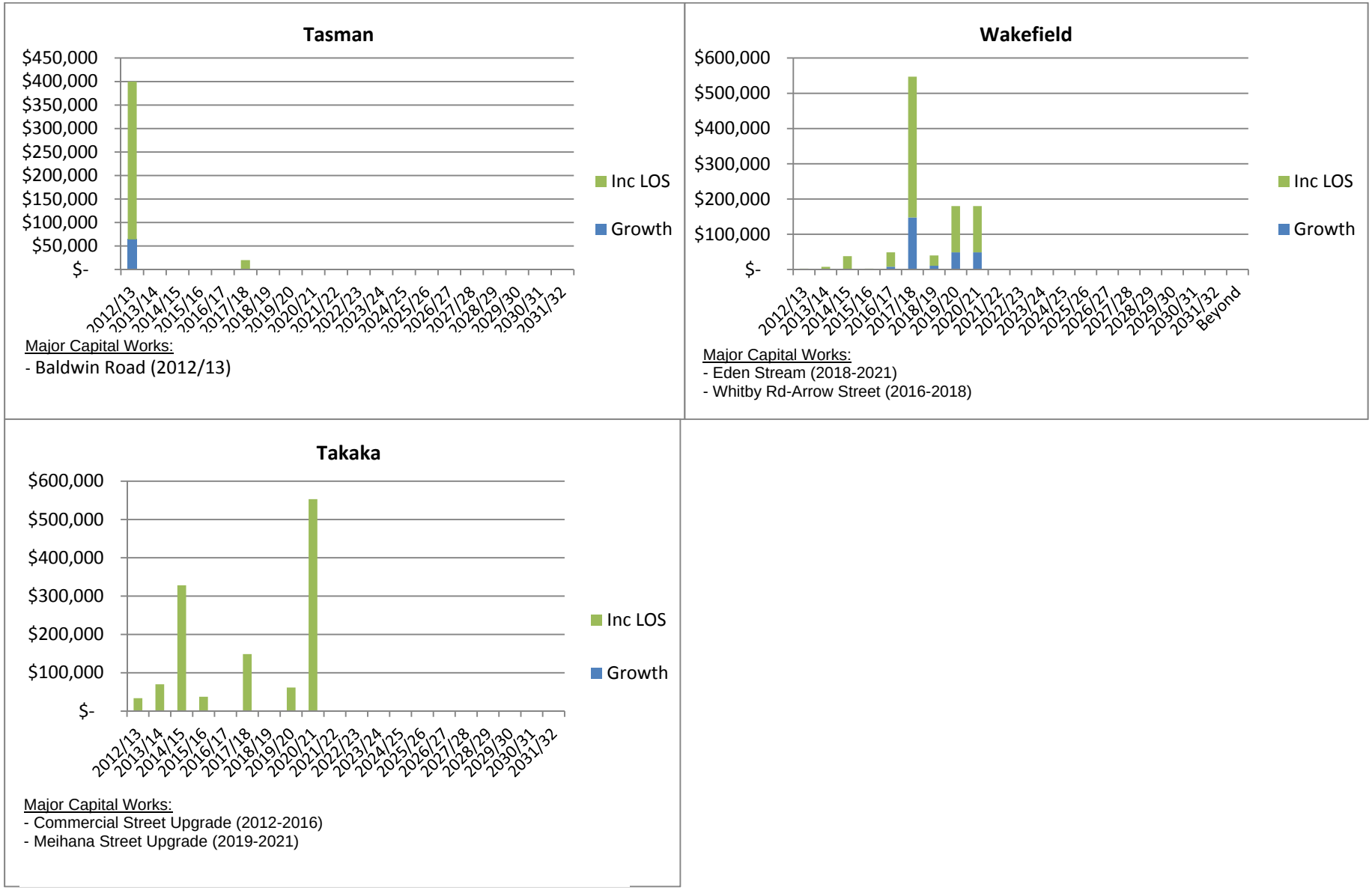


Figure F-3: 2012 – 2032 Stormwater New Capital Expenditure – by Individual Scheme

Table F-3: New Capital Expenditure for the Next 20 Years

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
2	Brightwater	Mt Heslington Drain Diversion	Improve Railway Diversion drain plus new Mt Heslington stream diversion. Rintoul Place, Block off 1 No. 375 dia. culvert and ditch along SH to drain towards the stock yard. Link to Storm ID #56.	6046216002	$ 2,060,400	$ 2,060,400	$ -	$ -	$ -	$ -	$ -	$ -	$ 103,020	$ 206,040	$ 824,160	$ 927,180	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
122	Brightwater	Discharge Consent	Discharge Consent	6046216004	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	Collingwood	Gibbs Road Diversion (previously Elisabeth St project)	New 600 pipe to intercept stormwater flows on Gibbs Road. Total length of new 600 dia pipe is 125m. Also construct gravel interception chamber at bottom of Gibbs road.	6216216001	$ 710,300	$ 710,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 71,030	$ 639,270	$ -	$ -	$ -	$ -	$ -	$ -	$ -
123	Collingwood	Discharge Consent	Discharge Consent	6216216003	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5	Kaiteriteri/Riwaka	Motorcamp outlet pipe	Includes modifications to improve flooding around the Motorcamp	6226216002	$ 182,300	$ 182,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,230	$ 164,070	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
124	Kaiteriteri/Riwaka	Discharge Consent	Discharge Consent	6226216003	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Ligar Bay	Abel Tasman drive culvert	Replace culvert on north side of Leisure Lane in Ligar Bay and drain improvement work	6246216001	$ 181,800	$ 181,800	$ -	$ 9,090	$ 25,452	$ 141,804	$ 5,454	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
125	Ligar Bay	Discharge Consent	Discharge Consent	6246216002	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	Mapua	School Road Drain	Upgrade culvert capacity crossing Aranui Rd at top end of School Rd drain	6036216001	$ 98,455	$ 98,455	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 98,455	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	Mapua	Langford, other small areas	Project Scope, based on solutions proposed in Mapua Stormwater Investigations, Higgs Road report, but including pipework upgrades in James Cross Place, Langford Drive and Coutts Place	6036216002	$ 305,820	$ 305,820	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 305,820	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
9	Mapua	Pinehill Heights	Connect to stormwater system at Brabant Drive /Pinehill Rd with 1050 pipe inc. culvert under Pinehill Road and pipe to connect to SH6 culvert further downstream. New 600 dia. pipe on Brabant Drive.	6036216003	$ 356,164	$ 356,164	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 35,616	$ 320,547	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
65	Mapua	Pomona Rd/Stafford Dr	Drainage improvements at intersection of Pomona Rd and Stafford Drive	6036216006	$ 325,000	$ 325,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,000	$ 45,500	$ 260,000	$ 6,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
66	Mapua	Crusader Drive	Drainage improvements from Crusader Dr to Stafford Dr (SP2)	6036216007	$ 275,100	$ 275,100	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,004	$ 38,514	$ 220,080	$ 5,502	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
69	Mapua	Stafford Drive		6036216008	$ 132,100	$ 132,100	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,284	$ 18,494	$ 105,680	$ 2,642	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
83	Mapua	Seaton Valley Stream - Stage 2	Stream widening at Clinton-Baker.	6036216009	$ 348,000	$ 348,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,920	$ 48,720	$ 278,400	$ 6,960	$ -	$ -	$ -	$ -	$ -	$ -	$ -
88	Mapua	Seaton Valley Stream - Stage 1	Stream widening at Senior and Evans	6036216010	$ 373,100	$ 373,100	$ 14,924	$ 52,234	$ 298,480	$ 7,462	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
89	Mapua	Toru Street	Drainage improvements at Toru St and the Aranui Rd tennis courts incl. investigations into best solution and est. of capital work	6036216011	$ 463,400	$ 463,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 37,072	$ 69,510	$ 324,380	$ 32,438	$ -	$ -	$ -	$ -	$ -
126	Mapua	Discharge Consent	Discharge Consent	6036216012	$ 20,000	$ 20,000	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	Motueka	Flap Gates	Investigate best solution; and improve/refurbish all existing flap gates.	6026216001	$ 111,650	$ 11,165	$ -	$ -	$ 1,117	$ 10,049	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
14	Motueka	New Development Areas	Network upgrade to accommodate new development and upgrade existing system from the area north of King Edward Street and connecting to the Woodland Drain	6026216003	$ 2,550,400	$ 2,550,400	$ -	$ -	$ -	$ -	$ -	$ 102,016	$ 255,040	$ 255,040	$ 969,152	$ 969,152	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
67	Motueka	Pah/Atkins Street Upgrade	Increase capacity	6026216008	$ 179,700	$ 26,955	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,348	$ 25,607	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
68	Motueka	Parker Street Upgrade	Increase culvert capacity	6026216009	$ 180,000	$ 27,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 27,000	$ -	$ -	$ -	$ -
102	Motueka	Motueka Upgrade Strategy	Develop strategy subject to recommendations of Stormwater Model 2011/12. Maybe Boyce/Clay Street (identified last AMP)	6026216011	$ 50,750	$ 50,750	$ 50,750	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
127	Motueka	Discharge Consent	Discharge Consent	6026216010	$ 20,000	$ 20,000	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19	Murchison	Recreation Centre	Improve existing stream behind the rec centre out to Fairfax Street.	6076216001	$ 192,200	$ 192,200	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 192,200	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
70	Murchison	Pipe Renewals	Fairfax Street (Asset Valuations 2009) and upgrade sumps (north and south)	6076216002	$ 350,400	$ 150,672	$ -	$ -	$ -	$ -	$ -	$ -	$ 150,672	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	Murchison	Discharge Consent	Discharge Consent	6076216003	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	Patons Rock	Discharge Consent	Discharge Consent	6276216002	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
21	Pohara	Pohara Main Settlement	Upgrade culverts and upsize channels	6316216001	$ 1,235,000	$ 1,235,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 74,100	$ 148,200	$ 988,000	$ 24,700	$ -	$ -
130	Pohara	Discharge Consent	Discharge Consent	6316216003	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	Richmond	Beach Road	Box culvert/ open channel conc ditch - Option 3, MWH Report	6146216001	$ 7,324,500	$ 7,324,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 732,450	$ 732,450	$ 2,929,800	$ 2,929,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -
25	Richmond	Borcks C - Queen Street to SH60	Borcks Creek Widening (LINK to Richmond WTP: design Y1, construct Y2)	6146216003	$ 5,124,431	$ 5,124,431	$ -	$ -	$ 256,222	$ -	$ -	$ 768,665	$ -	$ -	$ -	$ 1,024,886	$ -	$ -	$ -	$ -	$ 1,024,886	$ -	$ 1,024,886	$ -	$ -	$ 1,024,886	$ -
26	Richmond	Borcks C - SH60 to SH6	Borcks Creek Widening	6146216004	$ 2,117,290	$ 2,117,290	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,117,290	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
28	Richmond	Borcks C - Headingly lane	Borcks Creek Widening	6146216006	$ 957,247	$ 957,247	$ -	$ -	$ 47,862	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 143,587	$ -	$ -	$ -	$ -	$ -	$ 765,797	$ -	$ -	$ -	$ -
29	Richmond	Henley School	Stormwater pipe to Reservoir Creek	6146216007	$ 203,000	$ 203,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 203,000
30	Richmond	Hill Street	New stormwater system from Kingsley Place to Hill Street and along to Angelis Avenue.	6146216008	$ 1,243,588	$ 1,243,588	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 124,359	$ 1,119,229	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
32	Richmond	Middlebank Drive	Installation of stormwater pipe from Gladstone Road to Olympus Drive to Middlebank Drive. Links to WATER ID ??	6146216010	$ 3,720,600	$ 3,720,600	$ -	$ -	$ 186,030	$ 186,030	$ 2,232,360	$ 930,150	$ 186,030	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
33	Richmond	Oxford Street CBD	Partial Upgrade Option	6146216011	$ 2,529,100	$ 2,529,100	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,264,550	$ 1,264,550	$ -	$ -	$ -	$ -	$ -	$ -	$ -
34	Richmond	Park Drive	Increase capacity through Ridings Grove. Duplicate line in walkway reserve and upgrade Hill Street crossing to Q50. Do in two parts: Hill St culverts, then Riding Grove pipe.	6146216012	$ 978,600	$ 978,600	$ -	$ -	$ -	$ -	$ -	$ -	$ 39,144	$ 137,004	$ 743,736	$ 58,716	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	Richmond	Poutama Drain	New box culvert to divert stormwater from King/Gladstone and Waverly/Gladstone to new open drain out to Borck Ck.	6146216013	$ 2,829,800	$ 2,829,800	$ 141,490	$ 141,490	$ 2,405,330	$ 141,490	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	Richmond	Queen Street	Intercept flows upstream jct Salisbury Rd and provide additional hydraulic capacity, by replacing existing 900 dia. pipe with twin 1050 dia. pipe (over 520m) and single 900 dia. pipe over 360m. Link to ROADING ID ??	6146216014	$ 2,458,400	$ 2,458,400	$ 73,752	$ 147,504	$ 196,672	$ 983,360	$ 983,360	$ 73,752	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
38	Richmond	Richmond South - Reed Andrews	Reed Andrews Drain Widening	6146216016	$ 1,256,672	$ 1,256,672	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 125,667	$ 1,131,004	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
39	Richmond	Richmond South - Bateup Drain	Bateup Drain Widening	6146216017	$ 706,237	$ 706,237	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 706,237	$ -	$ -	$ -	$ -	$ -	$ -	$ -
40	Richmond	Richmond South - Eastern Hills	Eastern Hills Drain Widening	6146216018	$ 149,408	$ 149,408	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 149,408	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
41	Richmond	Richmond South - Hart Drain	Hart Drain Widening	6146216019	$ 329,165	$ 329,165	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 329,165	$ -	$ -	$ -	$ -	$ -	$ -
43	Richmond	Surrey Road (Blair Tce Drain)	Maintenance problem with access to ditch running behind houses on Surrey Road; solution, to pipe the 150m long section of open drain with 475 ribbed land drainage culvert (plastic)	6146216021	$ 80,794	$ 80,794	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 80,794	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	Richmond	(Richmond South and Borcks Creek)	Land purchase costs for Richmond South and Richmond West (Borcks Creek)	6146216023	$ 4,582,500	$ 4,582,500	$ -	$ -	$ 458,250	$ -	$ -	$ 916,500	$ -	$ 916,500	$ -	$ -	$ 916,500	$ -	$ 687,375	$ -	$ -	$ 687,375	$ -	$ -	$ -	$ -	$ -
71	Richmond	Sump Upgrades	Strategy and renewals/upgrades in in Richmond (Elisabeth and Darcy Streets (Asset Valuations 2009)) (Across all UDAs)	6146216026	$ 400,000	$ 400,000	$ -	$ -	$ 20,000	$ 180,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ 180,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -

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
72	Richmond	Soak Hole Upgrades	Strategy and renewals/upgrades in Richmond (Across all UDAs). Soakage improvements on Whiting Drive/Lord Auckland (proj #57) now included in this scheme and to be highest priority	6146216027	$ 400,000	$ 80,000	$ -	$ -	$ -	$ 4,000	$ 36,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,000	$ 36,000	$ -	$ -	$ -	$ -	$ -	$ -
73	Richmond	Queen St Salisbury Road Intersection improvements	Link to Transport 160T	6146216028	$ 442,400	$ 442,400	$ -	$ -	$ 44,240	$ 398,160	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
74	Richmond	Three Brothers Corner	New 750 dia pipe through Norman Andrews Place and continuing under SH6 to Collins St (Link to come after Borck Ck projects STORM ID #28)	6146216029	$ 655,400	$ 655,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 19,662	$ 78,648	$ 543,982	$ 13,108	$ -	$ -	$ -	$ -	$ -
76	Richmond	Salisbury Rd Upgrade	Extend to William St. Link to ROAD ID ??	6146216030	$ 590,300	$ 590,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 118,060	$ 472,240	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
77	Richmond	Ranzau Rd/ Paton Rd/White Rd	Upgrade to White Rd and Ranzau Rd at Paton Rd intersection.	6146216031	$ 969,400	$ 969,400	$ 48,470	$ 38,776	$ 106,634	$ 746,438	$ 29,082	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
79	Richmond	Discharge Consent	Discharge Consent	6146216033	$ 20,000	$ 20,000	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
80	Richmond	Quality Improvements	Quality improvements as identified in the CMP	6146216034	$ 507,500	$ 507,500	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ 50,750	$ -	$ -
131	St. Arnaud	Discharge Consent	Discharge Consent	6236216002	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
46	Takaka	Waitapu Road	New stormwater pipes	6066216001	$ 148,799	$ 148,799	$ -	$ -	$ -	$ -	$ -	$ 148,799	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	Takaka	Meihana Street Upgrade	New stormwater pipes	6066216002	$ 614,481	$ 614,481	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 61,448	$ 553,033	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
48	Takaka	Commercial Street Upgrade	New stormwater pipes	6066216003	$ 437,600	$ 437,600	$ 21,880	$ 70,016	$ 328,200	$ 17,504	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
91	Takaka	Te Kakau Stream	Realign outlets into Te Kakau Stream	6066216004	$ 12,000	$ 12,000	$ 12,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
132	Takaka	Discharge Consent	Discharge Consent	6066216005	$ 20,000	$ 20,000	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	Tapawera	Totara St	50m of 750 id culvert to replace 550 id culvert from Totara Street + new headwall	6286216001	$ 235,683	$ 235,683	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 235,683	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
133	Tapawera	Discharge Consent	Discharge Consent	6286216004	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	Tasman	Baldwin Road	Remaining portion of 110m of 900 internal diameter inclusive of a headwall for flow entry at the upstream pipe entrance and construction of 95m of open channel watercourse upstream (1m bottom width and 1m deep).	6296216001	$ 400,000	$ 400,000	$ 400,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
134	Tasman	Discharge Consent	Discharge Consent	6296216002	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
51	Wakefield	Eden Stream	Increasing size of existing channel, capacity through 7 No. culvert crossings, Construction of 160m of channel, Construction of new box culvert to cross under SH 6	6056216001	$ 400,012	$ 400,012	$ -	$ -	$ -	$ -	$ -	$ -	$ 40,001	$ 180,005	$ 180,005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
53	Wakefield	Whitby Rd to Arrow Street	Upsize the existing stormwater pipe along Whitby Road from Arrow Street to discharge into the Pitfure Stream	6056216003	$ 575,911	$ 575,911	$ -	$ -	$ -	$ -	$ 28,796	$ 547,115	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
82	Wakefield	Pitfure Rd	Replace existing stormwater pipe from SH6 and Pitfure Rd intersection out to an open drain into Pitfure Ck.	6056216005	$ 152,900	$ 50,457	$ 2,523	$ 7,569	$ 37,843	$ 2,523	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
135	Wakefield	Discharge Consent	Discharge Consent	6066216006	$ 20,000	$ 20,000	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1	Richmond	Reservoir Creek Dam	New Spillway	6146216035	$ 748,674	$ 419,257	$ 419,257	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Note: Does not include inflation			TOTALS		$ 56,799,095	$ 53,886,610	$ 1,185,046	$ 557,429	$ 4,432,331	$ 2,889,569	$ 3,355,052	$ 3,557,747	$ 793,907	$ 2,354,095	$ 3,753,468	$ 5,301,760	$ 2,472,733	$ 4,186,616	$ 5,692,980	$ 5,929,725	$ 2,258,413	$ 810,671	$ 1,864,783	$ 198,950	$ 988,000	$ 1,100,336	$ 203,000

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 Stormwater Development Contribution in place (as shown in Table G-1below)

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 the Stormwater Development Contributions expected over the 10 year period of the Long Term Plan has been prepared by Council's Corporate Service 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

H.1 Introduction

The statutory framework defining what activities require resource consent 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 quantify, level and flow of water in any water body
- the control of discharges or contaminants onto land and into water, and discharges of water into 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.

A very important aspect of the stormwater activity is to ensure that the district's natural waterways and water resources are managed responsibly.

Stormwater drainage systems have a significant role in the environment. Open channel stormwater systems can provide a buffer between the urban and rural environments, and high value receiving waters such as rivers, estuaries, wetlands, lakes and coastal waters. In themselves they are potentially an important environmental asset providing habitats for native plants, birds and aquatic life. Conversely all stormwater discharges, whether open channels or reticulated systems, introduce a significant risk of quickly conveying contaminants into highly valued environments. Cumulative adverse effects of the build-up of contaminants from urban stormwater (eg. heavy metals) are important environmental considerations.

Stormwater quality is an issue that is attracting national interest, and it is expected that in the future, there will be more pressure to improve stormwater quality. It is not expected that this will lead to national stormwater quality standards, however it is expected that regional authorities will be more vigilant of adverse effects associated with the quality of stormwater discharges.

Presently, the driver for action is the need to demonstrate compliance with the TRMP, and in particular Part VI of that Plan: Discharges, Chapter 36. In terms of those Plan provisions, most discharges from Council managed stormwater systems in Tasman are considered to be 'Permitted Activities' and therefore there are few discharge permits required for the stormwater activity. However, to be a Permitted Activity, a stormwater discharge has to comply with various conditions, one being that "…. the discharge does not cause or contribute to the destruction of any habitat, plant or animal in any water body or coastal water".

In order to formulate an approach to the district's stormwater quality, the Council intends to investigate current national practices and standards in stormwater quality management; current knowledge of Richmond stormwater quality and its impacts on the environment; and possible approaches and strategies Council could employ to better manage stormwater quality. These projects have been programmed in the Operations budget, refer to Appendix E for further details.

Resource consents may also be required for stormwater inlet and outlet structures including tide gates on rivers and streams and on the coast; for detention and ponding areas, and flood diversion bunds within stormwater systems; and also for modifying natural streams (such as widening stream channels to increase flood flow capacity).

Subdivision developments may involve new stormwater discharges or extensions to the existing network of stormwater assets which require resource consents that Council will become responsible for when the new stormwater assets are transferred from the developer to Council.

Designations are a way provided by the RMA of identifying and protecting land for future public works. Council has notified a proposed designation for stormwater drainage purposes in Richmond West (Poutama Drain), to ensure that improvements can be made to stormwater systems in the Richmond urban area.

H.2 Resource Consents

H.2.1. Discharges and Diversions

Most of the discharges and diversions associated with Council managed stormwater systems to natural waterways or the coast were established prior to September 1998 and are considered to be Permitted Activities provided that they comply with the conditions set out in Rule 36.4.2 of the TRMP.

Any new stormwater discharges or water diversions will require a resource consent, unless they are in rural or open space zones.

Water diversions include bunds and the situations where natural streams have been piped as part of an urban reticulation system. A resource consent will be required.

H.2.2. Inlet and Outlet Structures

Structures on or extending onto or over river or stream beds, or on a shoreline, may require resource consent. Inlet structures are usually installed where natural streams flow into piped systems.

Identifying the full suite of on-going resource consent requirements for stormwater structures will be influenced by provisions of the pending Part IV of the Tasman Resource Management Plan: Rivers and Lakes, which will determine what resource consents are required for structures in river and stream beds.

H.2.3. Detention Dams and Ponding Areas

Detention dams and ponding areas can be used to manage peak flood flows within specific stormwater catchments, especially where urban development increases the rate of run-off. Council now has responsibilities for 12 such detention dams and ponding areas within the following urban localities around the district:

- Richmond (7)
- Wakefield (1)
- Ruby Bay (1)
- Motueka (2)
- Pohara (1).

The number of detention structures in Richmond is likely to change in line with the proposed improvements to the stormwater systems in the Richmond urban area.

H.2.4. Channel Widening and Other Works in Waterways

Capital Works to modify stream beds usually require a resource consent. However, maintenance work is generally covered under River Protection and Maintenance Works Resource Consent (NN010109 – currently in the process of being renewed) under the jurisdiction of the rivers activity.

H.2.5. Schedule of Resource Consents

A detailed register of stormwater resource consents is listed in Table H-1 below. It should be noted that the list is accurate at the time of compilation (September 2011), and is subject to change.

Table H-1: Schedule of Current Resource Consents Relating to the Stormwater Activity

Location	Consent No.	Consent Type	Effective Date (ER)	Expiry Date
Pinehill Stream maintenance, Ruby Bay	RM061006	Coastal Permit (use of coastal marine area)	22/01/2007	12/12/2041
Kaiteriteri	RM070348/RM070349	Coastal Permit (use of coastal marine area)	20/07/2007	29/06/2042
Lewis Street, Collingwood	RM090204	Land Use Consent (other)	4/05/2009	4/05/2044
Cornwell Place, Tata Beach	RM080228/RM080230/RM080746	Discharge To Land Permit	26/08/2008	25/08/2043
Patons Rock Road, Patons Rock	RM060706	Coastal Permit (use of coastal marine area)	7/09/2006	15/09/2037
Jimmy Lee Creek, Richmond	RM090901/RM090902	Multiple Consents	22/03/2010	31/05/2030
Jimmy Lee Creek, Richmond	RM100059/RM100060	Multiple Consents	22/03/2010	31/05/2030
Lodestone Road, Richmond	RM100061/RM100062	Multiple Consents	22/03/2010	30/05/2030
Jimmy Lee Creek (Beach Road), Richmond	RM100662	Land Use Consent (use of the beds of lakes and rivers)		21/10/2045
Reservoir Creek (Champion Road), Richmond	RM100465	Land Use Consent (use of the beds of lakes and rivers)		1/09/2045
Reservoir Creek (Champion Road), Richmond	RM100466	Land Use Consent (other)		1/09/2045
Eden Dam on 88 Valley Stream (88 Valley Road), Wakefield	RM110111	Water Permit (water take, use, dam or divert)	4/04/2011	31/05/2031
Eden Dam on 88 Valley Stream (88 Valley Road), Wakefield	RM110112	Land Use Consent (use of the beds of lakes and rivers)	4/04/2011	31/05/2031
High and Eglinton Streets, Motueka	RM110089/RM110090	Multiple Consents	15/02/2011	15/02/2012

Source: NM2

NB: this table does not include expired consents, or the Poutama Drain, Richmond Designation consent.

Further detail of these resource consents is in the relevant section of Appendix B.

Where permits for discharges, water takes or coastal activities, or consents for river beds are required, the RMA restricts those consents to a maximum term of 35 years only. Hence there needs to be an on-going programme of "consent renewals" for those components of Council's stormwater activities, as well as a monitoring programme for compliance with the conditions of permitted activities or resource consents. Consent renewals have been programmed in the Capital Works budgets, refer to Appendix I for further details.

H.3 Resource Consent Reporting and Monitoring

Council aims to achieve minimum compliance with all consents and / or operating conditions. The achievement of stormwater 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 annually 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 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 also drives the overall stormwater annual monitoring programme. 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 NZ Limited 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

There is currently no category for Stormwater designations in the TRMP"[9].

However, the following designations have been granted post-TRMP as part of resource consent applications, see Table H-2 below.

Table H-2: Property Designations

Location	Consent No.	Consent Type	Effective Date (ER)	Expiry Date
Poutama Drain, Richmond	RM080291	Designation	28/09/2009	28/09/2029

Source: NM2

[9] Tasman Resource Management Plan Appendix 1 to Part II Land section A1.10

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 Renewals 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 the assets is sufficiently high.

Renewal decisions are supported by the consultant's and maintenance contractor's annual report and programme of work based on their knowledge of the systems. In addition, the theoretical life expectancies of asset components have been used for the purpose of financial projections.

Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

- structural failure
- repeated asset failure
- excessive rate of infiltration
- loss of hydraulic performance
- repeated joint failure
- ineffective and/ or uneconomic operation
- effluent breakthrough/ pollution events
- inefficient energy consumption.

The renewal programme will be reviewed at least annually, with any deferred work re-prioritised alongside new renewal projects and a revised programme established.

Assets requiring renewals including all mechanical, electrical, and civil works were identified from the Confirm database and the Asset Valuations Report. Assets with anticipated failure year and replacement costs were discussed at the project identification workshops.

To smooth the expenditure profile the timing of some renewal projects have been grouped together in a logical manner to minimise the cost of the renewal.

Prior to any assets being renewed, the operations and maintenance contractor will inspect these assets to confirm whether renewal is actually necessary. In the event it does not need to be renewed, a recommended date of renewal is then entered into the Confirm database. This new date will then be included in the next AMP update.

I.3 Delivery of Renewals

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

I.4 Renewal Standards

The work to be performed and materials to be used shall comply with the current Tasman District 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 Stormwater Renewals Strategy Draft Report – November 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.

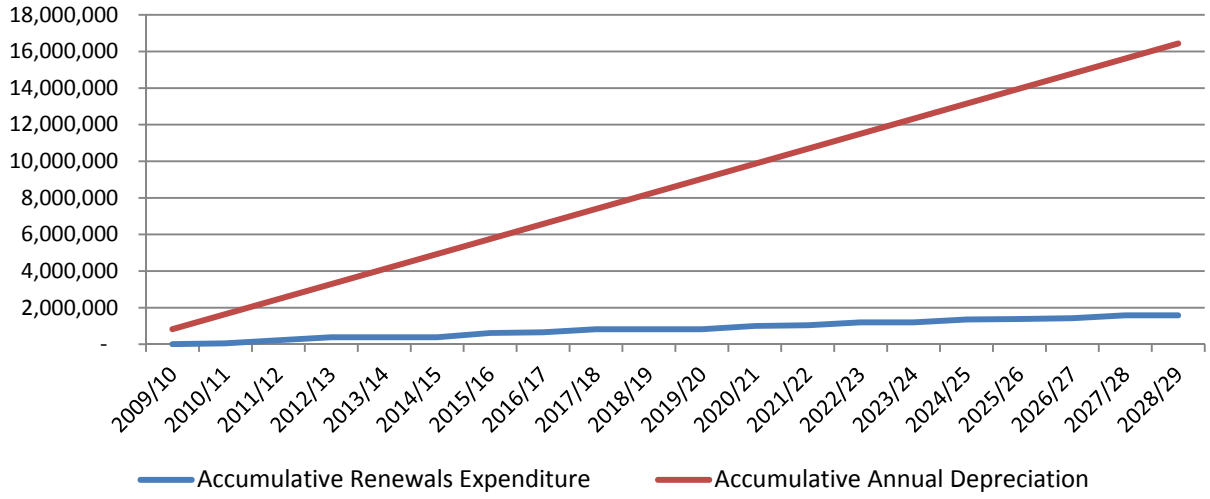


Figure I-1: Comparison of Accumulative Renewals Expenditure vs Annual Depreciation

Figure I-1 shows Council is not investing in renewals at anywhere near the level of depreciation. This would indicate that the assets are being consumed.

However, the stormwater assets are such long life assets and young in their life relatively, there is not much need for renewals. To be investing in renewals would be spending money on perfectly good assets with not real benefit.

It is therefore quite appropriate for Council to be accumulating deferred maintenance.

It would be expected that Council are collecting the shortfall between renewals and depreciation and holding it in reserves.

I.5.2. Management and Mitigation of Deferred Renewals

To improve the information base for the renewals strategy and replacement programme, Council should 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

Figure I-2 below shows a summary of the expenditure forecast for renewals over the next 20 years whilst Table I-1 at the end of this Appendix shows the full breakdown of expenditure.

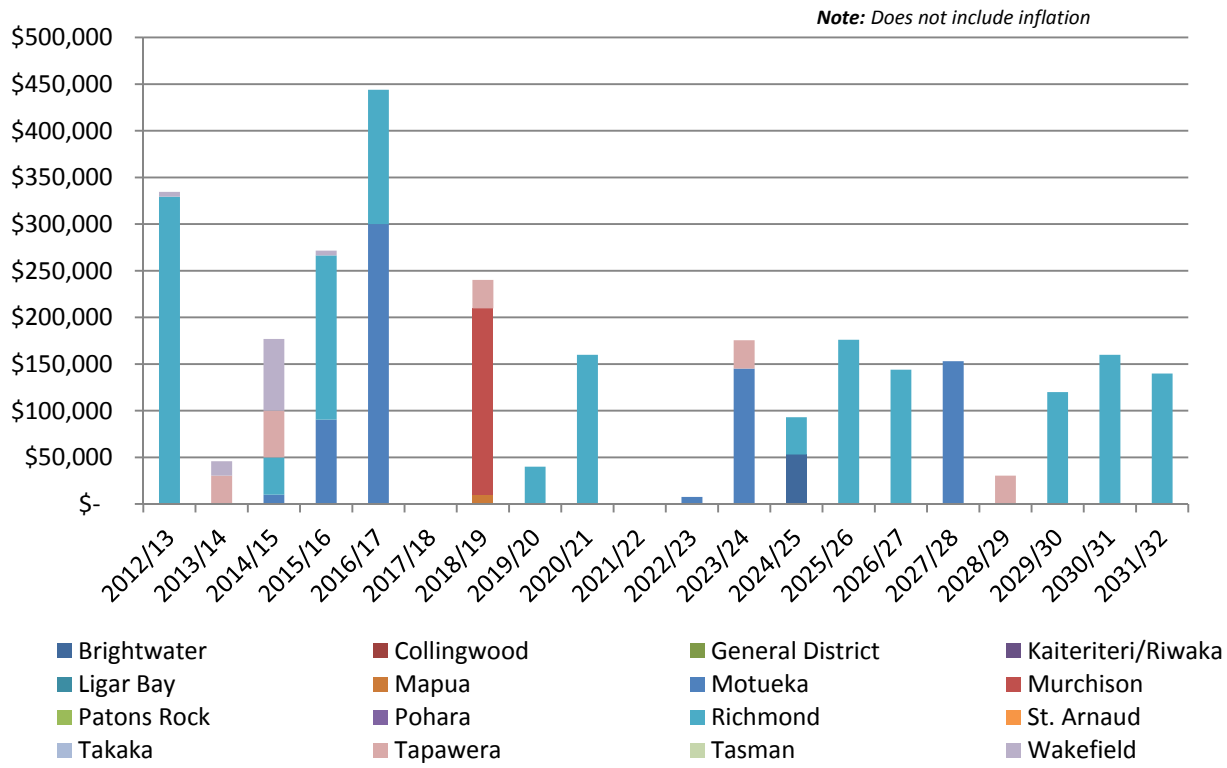


Figure I-2: 2012-2032 Stormwater Renewals Expenditure Forecast

Table I-1: Renewal Expenditure for the Next 20 Years

Stormwater Forecast Expenditure - Renewals

Item	Scheme	Project Name		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
55	Brightwater	Underpass Pumpstation Renewals	Renewal of pump, control cabinet, telemetry (Asset Valuations 2009)	6046216003	$ 53,000	$ 53,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 53,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
64	Mapua	Seaton Valley Resource Consent Renewal	Seaton Valley Drain consents expire 29 July 2019 (RM080112, RM08013, RM0800260, RM080261, RM080262, RM080113)	6036216005	$ 10,000	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	Motueka	Flap Gates	Investigate best solution; and improve/refurbish all existing flap gates.	6026216001	$ 111,650	$ 100,485	$ -	$ -	$ 10,049	$ 90,437	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
17	Motueka	Tidal gate renewal	Renewal of gates, hydraulics, control cabinets and telemetry at 2x Woodlands Drain Gates (Old Wharf Road at Woodlands Drain bridge) and at 1x Wharf Rd Gates (Asset Valuations 2009). Assess condition of remaining Thorp Drain Tidal Gate.	6026216006	$ 300,000	$ 300,000	$ -	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
67	Motueka	Pah/Atkins Street Upgrade	Increase capacity	6026216008	$ 179,700	$ 152,745	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,637	$ 145,108	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
68	Motueka	Parker Street Upgrade	Increase culvert capacity	6026216009	$ 180,000	$ 153,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 153,000	$ -	$ -	$ -	$ -
70	Murchison	Pipe Renewals	Fairfax Street (Asset Valuations 2009) and upgrade sumps (north and south)	6076216002	$ 350,400	$ 199,728	$ -	$ -	$ -	$ -	$ -	$ -	$ 199,728	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
31	Richmond	Lodestone Park	Replace existing inlet structure with new inlet structure for Loadstone Park temporary storage pond	6146216009	$ 139,867	$ 139,867	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 139,867
62	Richmond	Detention Dam Consent Renewals	Consents expire 31 May 2030 (Bill Wilkes, Washbourne, Lodestone, Eden)	6146216025	$ 80,000	$ 80,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 80,000	$ -	$ -	$ -	$ -
72	Richmond	Soak Hole Upgrades	Strategy and renewals/upgrades in Richmond (Across all UDAs). Soakage improvements on Whiting Drive/Lord Auckland (proj #57) now included in this scheme and to be highest priority	6146216027	$ 400,000	$ 320,000	$ -	$ -	$ -	$ 16,000	$ 144,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 16,000	$ 144,000	$ -	$ -	$ -	$ -	$ -
78	Richmond	Richmond Renewals	CCTV shows areas in McGlashen, Doran, Waverley, Salisbury. MH-MH renewal	6146216032	$ 800,000	$ 800,000	$ -	$ -	$ 40,000	$ 160,000	$ -	$ -	$ -	$ 40,000	$ 160,000	$ -	$ -	$ -	$ 40,000	$ 160,000	$ -	$ -	$ -	$ 40,000	$ 160,000	$ -
103	Tapawera	Tapawera Forestry Board Int Drain	Renew channel: clear out remove gravel, repair	6286216002	$ 121,800	$ 121,800	$ -	$ 30,450	$ -	$ -	$ -	$ -	$ 30,450	$ -	$ -	$ -	$ -	$ 30,450	$ -	$ -	$ -	$ -	$ 30,450	$ -	$ -	$ -
104	Tapawera	Tapawera Maitai Crescent Drain	Renew channel: clear out remove gravel, repair	6286216003	$ 50,000	$ 50,000	$ -	$ -	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
82	Wakefield	Pitfure Rd	Replace existing stormwater pipe from SH6 and Pitfure Rd intersection out to an open drain into Pitfure Ck.	6056216005	$ 152,900	$ 102,443	$ 5,122	$ 15,366	$ 76,832	$ 5,122	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1	Richmond	Reservoir Creek Dam	New Spillway	6146216035	$ 748,674	$ 329,417	$ -	$ 32,942	$ 296,475	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			TOTAL		$ 56,799,095	$ 2,912,485	$ 5,122	$ 78,758	$ 473,356	$ 271,559	$ 444,000	$ -	$ 240,178	$ 40,000	$ 160,000	$ -	$ 7,637	$ 175,558	$ 93,000	$ 176,000	$ 144,000	$ 153,000	$ 30,450	$ 120,000	$ 160,000	$ 139,867

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 stormwater infrastructure have been estimated as detailed in Appendix D – Asset Valuations.

The following stormwater asset components have not been depreciated:

- Stormwater channels (open drains)
- Detention Dams earthworks
- Erosion control

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 stormwater activity to meet a desired level of service. Council will monitor and assess the state of the stormwater infrastructure and upgrade or replace components over time to counter the decline in service potential at the optimum times.

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 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

Capital works to be funded by loan over the next 10 years are projected to add up to the following costs detailed in Table K-1.

Table K-1: Projected Capital Works Funded by Loan for Next 10 Years

Stormwater	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)**	1,301	465	4,150	2,829	3,916	3,654	878	2,588	4,880	7,334
Opening Loan Balance **(x 1,000)**	11,142	11,569	11,196	14,421	16,168	18,845	21,106	20,344	21,398	24,639

Note: Figures do not include for inflation and are in thousands of dollars (ie. x1000)

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.

Council is still paying off loans raised by the previous county councils and boroughs, these are called pre amalgamation loans ie. pre 1989. All loans raised since 1989 have been by the Tasman District Council.

Table K-2: Projected Annual Loan Repayment Costs for Next 10 Years

Stormwater	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)**	681	694	807	1,009	1,190	1,398	1,534	1,482	1,680	1,999
Loan Principal **(x 1,000)**	874	839	925	1,082	1,237	1,394	1,641	1,534	1,639	1,845

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 presents a summary of the overall future financial requirements for the Stormwater activity in the Tasman district.

Table L-1: Summary of Projected Costs and Income for the Next 10 Years

Stormwater	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	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	2,547,610	2,709,817	2,935,692	3,056,692	3,560,087	3,833,696	4,390,961	4,595,516	4,679,477	5,072,474	5,534,756
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges and targeted rates for water supply	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	-	-	-	-	-	-	-	-	-	-	-
Local authorities fuel tax, fines, infringement fees, and other receipts	133,022	82,247	83,541	84,070	84,668	85,300	85,922	86,561	87,248	88,012	88,802
TOTAL OPERATING FUNDING	2,680,632	2,792,064	3,019,233	3,140,762	3,644,755	3,918,996	4,476,883	4,682,077	4,766,725	5,160,486	5,623,558
APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	1,061,206	798,001	964,714	929,036	1,063,360	1,019,284	1,189,545	1,225,505	1,281,250	1,365,592	1,463,700
Finance costs	752,569	681,327	694,321	806,920	1,009,438	1,190,497	1,398,340	1,533,659	1,481,834	1,680,348	1,999,031
Internal charges and overheads applied	380,594	394,187	391,153	402,090	408,439	424,138	446,245	449,828	470,330	495,634	502,046
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
TOTAL APPLICATIONS OF OPERATING FUNDING	2,194,369	1,873,515	2,050,188	2,138,046	2,481,237	2,633,919	3,034,130	3,208,992	3,233,414	3,541,574	3,964,777
SURPLUS (DEFICIT) OF OPERATING FUNDING	486,263	918,549	969,045	1,002,716	1,163,518	1,285,077	1,442,753	1,473,085	1,533,311	1,618,912	1,658,781

Stormwater

	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
	Budget $	Budget $	Budget $	Budget $	Budget $	Budget $	Budget $	Budget $	Budget $	Budget $	Budget $
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	341,187	410,568	437,940	421,517	640,487	618,590	635,012	618,590	624,064	624,064	624,064
Increase (decrease) in debt	700,047	427,357	(373,581)	3,225,429	1,747,051	2,678,487	2,259,689	(761,996)	1,053,443	3,241,709	5,489,320
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
TOTAL SOURCES OF CAPITAL FUNDING	1,041,234	837,925	64,359	3,646,946	2,387,538	3,297,077	2,894,701	(143,406)	1,677,507	3,865,773	6,113,384
APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
- to meet additional demand	-	50,312	41,739	966,233	858,209	34,640	2,209,654	327,944	1,571,200	1,358,257	2,923,179
- to improve the level of service	1,604,447	741,958	550,135	3,918,892	2,444,991	3,918,782	2,189,112	499,160	1,585,971	3,902,191	4,848,987
- to replace existing assets	-	785,061	57,464	240,001	331,276	571,743	-	502,575	53,646	224,238	-
Increase (decrease) in reserves	(76,950)	179,143	384,066	(475,464)	(83,420)	56,989	(61,312)	-	1	(1)	(1)
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
TOTAL APPLICATIONS OF CAPITAL FUNDING	1,527,497	1,756,474	1,033,404	4,649,662	3,551,056	4,582,154	4,337,454	1,329,679	3,210,818	5,484,685	7,772,165
SURPLUS (DEFICIT) OF CAPITAL FUNDING	(486,263)	(918,549)	(969,045)	(1,002,716)	(1,163,518)	(1,285,077)	(1,442,753)	(1,473,085)	(1,533,311)	(1,618,912)	(1,658,781)
FUNDING BALANCE	-	-	-	-	-	-	-	-	-	-	-

N.B. Figures do include inflation.

APPENDIX M FUNDING POLICY, FEES AND CHARGES

M.1 Funding Strategy

Stormwater expenditure is funded by:

- stormwater rates
- loans
- development contributions
- sundry income (dividends etc.).

The stormwater assets are funded in the main from a targeted rate called the “stormwater rate”. The stormwater services are, therefore, operated on a “user” or “beneficiary” pays basis and are not funded by any general rate appropriation.

Council operates a closed group account for all Council owned urban stormwater schemes, and a separate closed account for the General District Area.

Major capital projects may be loan funded. When loans are established, the loan is taken out 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.

M.2 Schedule of Fees and Charges

M.2.1. Stormwater Rates

Council sets a targeted rate for the purposes of stormwater works. This rate will be based on the capital value of each rating unit. The categories of property and the rates (in cents per dollar of capital value) for 2012/2013 are detailed in Table M-1.

Table M-1: Targeted Rates for Properties

Category	2011/2012	2012/2013
Richmond Urban Drainage Area	0.04715 cents	0.0474 cents
Brightwater Urban Drainage Area	0.04715 cents	0.0474 cents
Wakefield Urban Drainage Area	0.04715 cents	0.0474 cents
Murchison Urban Drainage Area	0.04715 cents	0.0474 cents
St Arnaud Urban Drainage Area	0.04715 cents	0.0474 cents
Tapawera Urban Drainage Area	0.04715 cents	0.0474 cents
Motueka Urban Drainage Area	0.04715 cents	0.0474 cents
Mapua/ Ruby Bay Urban Drainage Area	0.04715 cents	0.0474 cents
Tasman Urban Drainage Area	0.04715 cents	0.0474 cents
Kaiteriteri Urban Drainage Area	0.04715 cents	0.0474 cents
Takaka Urban Drainage Area	0.04715 cents	0.0474 cents
Pohara Urban Drainage Area	0.04715 cents	0.0474 cents
Ligar Bay/ Tata Beach Urban Drainage Area	0.04715 cents	0.0474 cents
Collingwood Urban Drainage Area	0.04715 cents	0.0474 cents
Patons Rock Urban Drainage Area	0.04715 cents	0.0474 cents
Balance of the Tasman District not in the above areas	0.00472 cents	0.0052 cents

APPENDIX N DEMAND MANAGEMENT

N.1 Introduction

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

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

N.2 Council's Approach to Demand Management

There is a move within many New Zealand councils to improve the quality of stormwater discharges and developing/ upgrading the stormwater system with sustainability issues in mind.

This has picked up momentum in recent years and is driven by the requirements embedded in the Resource Management Act 1991. Regulatory authorities have made it clear that stormwater quality improvements should be made by local councils and that the impact on discharging to the surrounding environment should be taking into consideration to determine the level of treatment required.

Many councils have started a programme of stormwater quality improvement works and it is hoped that all parties will recognise that immediate changes cannot be made, but properly planned and targeted, significant improvements can be made as part of the AMP process.

N.3 Project Stormwater

N.3.1. Overview

Project Stormwater is a cross-council project incorporating Engineering, Planning, and Environmental Science.

Project Stormwater is focused on improving Council's management of stormwater to achieve better stormwater values, including quality, quantity and ecological aspects. It covers many departments, affects multiple council processes and represents a fundamental change to Council philosophy regarding stormwater and associated land and activity management.

The scope of the project has progressively widened to encompass a low impact philosophy and to include various aspects of land and activity management, for example, subdivision development, that impact either directly or indirectly on stormwater values.

The term 'stormwater' in this project has been taken to mean all aspects of surface and ground water across both rural and urban land uses. However, the initial work undertaken has focused primarily on urban stormwater management and in particular those areas where the Council has direct management responsibilities.

It is envisaged that as the Council achieves their own stormwater goals, we will be in a better position to lead by example and direct other groups to achieve better stormwater management also.

N.3.2. Key Project Objectives

The key goals/objectives of Project Stormwater are.

- Council wide adoption of a low impact, multi-value philosophy towards stormwater management and associated land/activity management.

- Reflection of the low impact, multi-value philosophy in all council documents, processes and activities associated with stormwater.
- Obtaining relevant consents for all Council managed stormwater outfalls and discharges.
- Identifying and initiating improved Council stormwater management practices within each Urban Drainage Area – starting with Richmond.
- A programme of enhancement projects to improve stormwater values within natural, modified and reticulated stormwater systems within the UDAs.
- Better information on stormwater assets within UDAs including existing and potential stormwater values and GIS data.
- Improved management of stormwater assets including better integration of Engineering and Parks and Reserves responsibilities and outcomes, including lifecycle management of Low Impact Design (LID) devices – eg. rain gardens and naturalised streams (as assets).
- An increasing voluntary uptake of low impact approaches and successful design and implementation of these developments amongst local developers.
- Consistent consideration by all parties of stormwater projects within a catchment context, including both upstream and downstream, as well as temporal issues.
- An improvement in the riparian biodiversity and functioning within the region – starting within the UDAs.
- An increased awareness amongst residents and businesses, both urban and rural, of stormwater values, issues, solutions and opportunities for improvement.

N.4 Sustainable Development

N.4.1. Changing Climatic Patterns

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[10] 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.4.2. Temperature Change

Table N-1 shows that the mean annual temperatures in Tasman-Nelson are expected to increase in the future.

Table N-1: 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[11] 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.

[10] Climate Change Effects and Impacts Assessment A Guidance Manual for Local Government in NZ (MfE, May 2008)
[11] Climate Change and Variability – Tasman District (NIWA, June 2008)

N.4.3. Rainfall Patterns

Table N-2 shows an expected increase in mean annual precipitation in Tasman-Nelson from 1990 to 2090.

Table N-2: 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.4.4. Heavy Rainfall

A warmer atmosphere can hold more moisture (about 8% more for every 1^0C 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.

Table N-3 shows current rainfall depth-duration-frequency statistics for Richmond.

Table N-3: Current Rainfall Statistics for Richmond (in mm)

ARI (years)	Duration								
	10min	30min	1hr	2hr	6h	12hr	24h	48h	72h
2	7.5	14.4	20.7	28.3	46.5	57.2	72.8	87.4	97.9
5	1.08	19.9	28.1	37.8	61.4	74.9	95.0	114.1	128.6
10	13.6	24.2	33.8	45.0	72.3	87.7	110.7	132.7	149.6
20	16.6	28.9	39.8	52.5	83.8	100.8	126.6	151.2	170.1
30	18.6	31.9	43.7	57.2	90.8	108.7	136.1	162.2	182.1
50	21.3	36.0	48.8	63.5	100.0	119.1	148.4	176.3	197.4
100	25.6	42.0	56.4	72.6	113.3	134.0	165.7	195.8	218.4

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

Table N-4: Projected Rainfall Depth-Duration-Frequency Statistics for Richmond in 2040, for a mid-range temperature scenario (0.9^{0}C warming)

ARI (years)	Duration								
	10min	30min	1hr	2hr	6h	12hr	24h	48h	72h
2	8	15	22	30	49	60	76	90	101
5	12	21	30	40	65	79	100	119	134
10	15	26	36	48	77	93	117	140	158
20	18	31	43	56	89	107	135	161	181
30	20	34	47	61	97	117	146	174	195
50	23	39	52	68	107	128	159	189	212
100	27	45	60	78	121	144	178	210	234

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

Table N-5: Projected Rainfall Depth-Duration-Frequency Statistics for Richmond in 2090, for a mid-range temperature scenario (2.0^{0}C warming)

ARI (years)	Duration								
	10m	30m	60m	2hr	6h	12hr	24h	48h	72h
2	9	16	23	32	51	63	79	94	105
5	13	23	32	43	69	84	105	126	141
10	16	28	39	51	82	99	125	149	167
20	19	33	46	60	96	116	145	173	194
30	22	37	51	66	105	126	158	188	210
50	25	42	57	74	116	138	172	205	229
100	30	49	65	84	131	155	192	227	253

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

N.4.5. 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.4.6. Wind

NIWA concludes that there has not yet been enough research and modelling undertaken to allow a confident projection of how extreme wind speeds might change over the Tasman district, but that a small increase cannot be ruled out by 2100.

N.4.7. 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.4.8. Potential impacts on Council's Infrastructure and Services

Table N-6: 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 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	All.	Inappropriate location of urban expansion areas. Inadequate or inappropriate infrastructure, costly retro-fitting of systems.

Function	Affected Assets or Activities	Key Climate Influences	Possible Effects
	communications planning.		
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 urban open spaces.	Temperature and rainfall changes Extreme wind and rainfall events.	Changes/reduction in water availability. Changes in biodiversity. 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.

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 NOT RELEVANT TO STORMWATER ACTIVITY

APPENDIX P SIGNIFICANT EFFECTS

Schedule 10 of the Local Government Act (LGA) requires an outline of any significant negative effects that an activity may have on the social, economic, environmental, or cultural well-being. Potential negative effects associated with the Stormwater Activity are outlined in Table P-1.

Significant positive effects are described in terms of how this activity contributes to the Community Outcomes, and are outlined in Table P-2.

Table P-1: Potential Significant Negative Effects

Activity	Effect on Community Wellbeing	Significance	Current Controls
Flooding.	**Social:** Localised flooding in some residential areas due to overloading of the stormwater system. **Economic:** Localised flooding in some commercial areas due to overloading of the stormwater system. **Environmental:** Sediments, oils, greases, metals and organic material can be washed into natural water courses. **Cultural:** Flooding may have adverse effect on quality of receiving environment.	Moderate.	Catchment management planning. Hydraulic modelling. Capital works.
The discharge of untreated stormwater to rivers, streams and lakes.	**Environmental:** The discharge of untreated stormwater may have adverse effect on quality of receiving environment, eg. stormwater runoff following a dry period often contains many contaminants including sediments, oils, greases, metals and organic material washed from roads and other impervious areas, rubbish and contaminants illegally discharged into the stormwater system. In rural areas, runoff may be contaminated with herbicides, pesticides, fertilisers and animal waste. **Cultural**: Discharges may have adverse effect on quality of receiving environment.	Significant	Catchment management planning. Resource consenting Capital works.
The discharge of untreated wastewater to rivers, streams and lakes	**Environmental:** Discharges may have adverse effect on quality of receiving environment. **Cultural**: Discharges may have adverse effect on quality of receiving environment.	Moderate	Council has an active programme to reduce inflow, see Wastewater AMP.
Open Channel Maintenance	**Social:** Disruption to private property Environmental - Physical works may impact on in-stream values **Cultural** - Physical works may have adverse effect on quality of receiving environment.	Insignificant	Land Entry Agreements. Stakeholder consultation Tasman-Nelson Regional Pest Management Strategy 2007-2012.
Potential to affect historic and wahi tapu sites.	**Cultural** - Physical works may have adverse effect on quality of receiving environment.	Minor	Consultation prior to works. Record of known heritage sites.

Table P-2: Potential Significant Positive Effects

Effect	Description
Flooding (social benefits)	Council maintains stormwater collection and treatment systems to minimise disruption to normal community activities.
Flooding (economic benefits)	Council maintains stormwater collection and treatment systems to minimise damage to private and public assets.
Contaminant discharge (environmental and cultural benefits)	Council stormwater discharges to a receiving environment can be controlled to minimise any negative environmental impact from the discharge.
Aquatic life (environmental and cultural benefits)	Fish passage and aquatic life is considered when implementing capital projects.
Low impact design (environmental and cultural benefits)	Council's engineering standards promote the enhancement of recreational and environmental amenity value when developing new assets.
Financial Impact	Council's management of the Stormwater activities uses best practice and competitive tendering to provide value for money for rate payers and provides jobs for contractors..

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

1. All expenditure is stated in dollar values as at 1 July 2011, with no allowance made for inflation over the planning period.
2. 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.

As more knowledge is gained, a better forecast of capital expenditure will be incorporated into future forecasts. Refer to Appendix S for more information on completeness and confidence in asset data.

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 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.

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 has developed a computational hydraulic model for the Richmond and Mapua catchments, and is considering implementing these for other catchments.

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.

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 consents, especially where community input is necessary
- securing land purchase and/or land 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. 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 and how much should be funded from development contributions.
- whether the work will force the need to extend or create new Urban Drainage Area
- whether land owners will contribute directly to the works
- whether Council or other parties will subsidise the development of the projects.

The correctness of these assumptions has major consequences on the affordability of the works. The Council has a funding strategy for each project. This will form one part of the consultation process as these schemes are advanced toward construction.

Refer to Appendix M for further information.

Q.1.7. 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 to cost estimating, the following has 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 below, and from this an estimated 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% (±25% for projects >$1m)
Preliminary Design / Investigation	± 20% (±15% for projects >$1m)
Detailed Design	± 10%
Construction	± 5%
Commissioning	± 0%

The following table details significant uncertainties and percentage accuracies for major projects in the next three years of this AMP.

Table Q-2: Major Schemes (>$500K) Assigned to the First Three Years of this AMP

Project	Project Stage and Estimate Accuracy	Project Value in First 3 Years	Factors that could affect Estimate Accuracy
Richmond – Reservoir Creek – New Spillway.	Preliminary Design	$748,674	Landowner negotiations.
Richmond - Poutama Drain.	Detailed Design	$2,688,310	Ground conditions, consultation with key stakeholders.
Richmond - Richmond Land Purchase (Richmond South and Borck Creek).	Commissioning	$458,250	Landowner negotiations.

Q.1.8. Stormwater Discharge Quality

Until catchment management plans (CMPs) have been undertaken, the quality of the receiving environment is unknown, hence the quality required of stormwater discharges are unknown. At this stage, no allowance has been made for the treatment of stormwater. Individual catchments requiring stormwater treatment will be reassessed for inclusion in future AMPs.

Q.1.9. Resource Consents

The assumption has been made that Council has sufficient knowledge of discharge quality and receiving environments to apply for resource consents and that it will be granted resource consents for key projects and stormwater discharges. Catchment Management Plans will be undertaken prior to application for resource consent. Comprehensive catchment management plans will minimise the risk of failing to obtain resource consent

Q.1.10. Resource Consent Monitoring

The assumption has been made that the costs identified in this AMP for the monitoring of Resource Consents is sufficient. Until CMPs have been developed and resource consents applied for, the conditions requiring monitoring are unknown. Once this information is understood, Council may need to allocate additional costs for monitoring compliance against consent conditions.

Q.1.11. Changes in Legislation and Policy

It has been assumed that there will be no major changes in legislation or policy except for the need for Council to obtain resource consents for stormwater discharges. The risk of major change is high due to the changing nature of the government and politics. If major changes occur it is likely to have an impact on the required expenditure. Council has not mitigated the effect of this.

Q.1.12. Land Purchase

Council have made the assumption that it will be able to purchase land to undertake the capital works project. 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.1.13. Council's Disaster Fund Reserves

The assumption has been made that the level of funding held in Council's disaster fund reserves and available from insurance claims will be adequate to cover reinstatement following emergency events. The risk of inadequate reserves and 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.*"

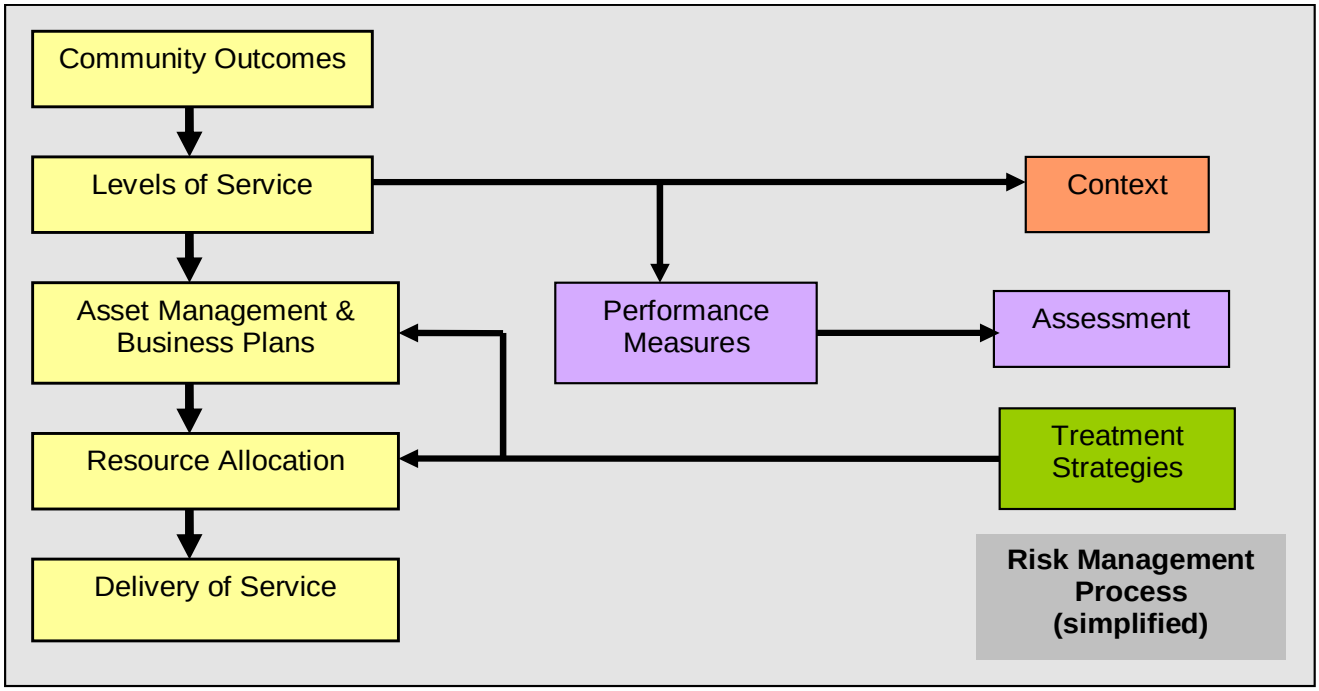


Figure Q-1: Integration of Risk Management Process into LTP Process

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.

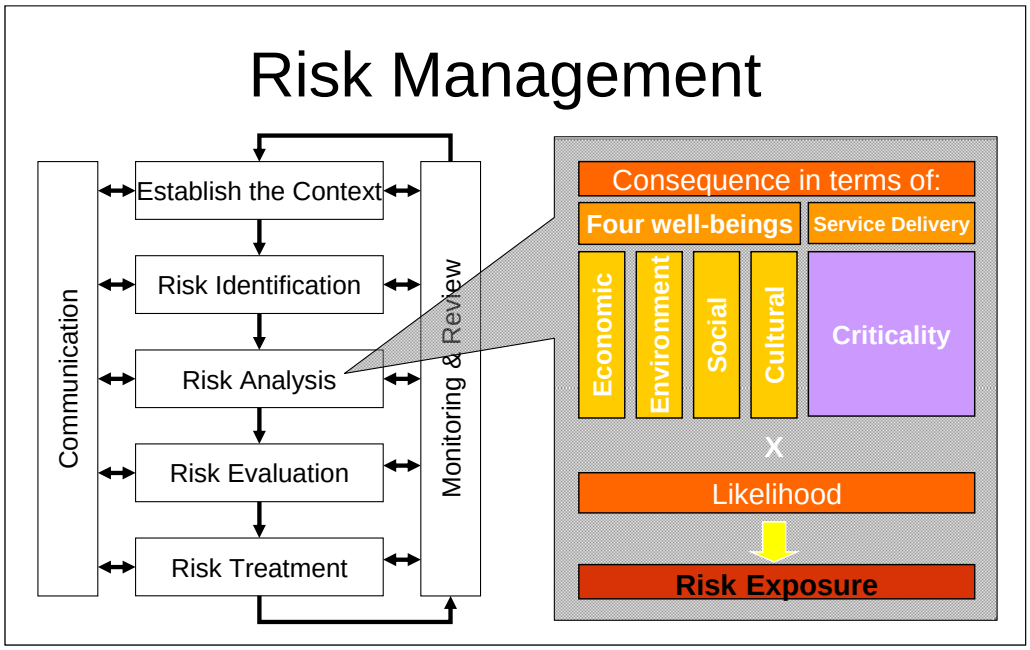


Figure Q-2: Integrated Risk Management Process

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.

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.

Category		Description
	Built Environment	Effect on the amenity, character, heritage and cultural, and economic aspects of the built environment and level of satisfaction with the amenity of the built environment.
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. 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.

Table Q-4: Current Risk Profile

RISK MATRIX - STORMWATER CURRENT RISK						
		CONSEQUENCE				
		Negligible (+/-1)	Minor (+/-10)	Medium (+/-40)	Major (+/-70)	Extreme (+/-100)
LIKELIHOOD	Almost Certain (5)					
	Likely (4)	2	2			
	Possible (3)		44	8	4	
	Unlikely (2)		17		4	
	Very Unlikely (1)		16	2	1	

By undertaking the projects and asset management activities detailed below, Council can reduce their risk profile to that shown in Table Q-5.

Asset Management Activity

- Test Emergency Management Plan
- Change TRMP to control earthworks better
- Improved integration with planning for future land zoning
- Design to give more consideration to access requirements
- Improve HAZOPs

Strategic Study

- Catchment Modelling
- New sub-divisions to be assessed for secondary flow paths
- Stormwater dam break failure assessments
- Stormwater By-law

Operational Project

- Increase monitoring
- Proactive maintenance ahead of bad weather
- Improve manhole and storm drain security
- Improved education of landowners

Table Q-5: Target Risk Profile

RISK MATRIX - STORMWATER TARGET RISK						
		CONSEQUENCE				
		Negligible (+/-1)	Minor (+/-10)	Medium (+/-40)	Major (+/-70)	Extreme (+/-100)
LIKELIHOOD	Almost Certain (5)					
	Likely (4)	2	2			
	Possible (3)		39	4	1	
	Unlikely (2)		25		4	
	Very Unlikely (1)		17	6		

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						
Landowners	Changing land use impacts volume and quality of water entering our systems.	District.	TRMP and Compliance. Engineering Standards. Input to zonal changes.	HIGH	Monitor.	HIGH
Iwi	Ineffective relationship impacts operations, maintenance and renewal works.	Coastal / Culturally sensitive areas.	Regular meetings.	HIGH	Monitor.	HIGH
Natural Hazards						
River Floods (1:400)	Impacts networks conveyance.	District.	No controls in place for this level.	HIGH	Monitor.	HIGH
Extreme Weather (Rain)	Impacts networks conveyance - surface water.	District.	Weather warnings, pre-checks in place following weather warnings, regular maintenance and inspections. Increased maintenance following warnings.	VERY HIGH		VERY HIGH
Extreme Weather (Rain)	Impacts networks conveyance - soakage network.	District.	Roading network maintenance.	VERY HIGH	More frequent maintenance from roading dept. Better sediment protection and assessment of soakage capacity. More input to development proposals.	HIGH
Extreme Weather (Rain)	Impacts access to infrastructure.	District.	Appropriate vehicles and resources in place.	VERY HIGH	Consider access requirements in more detail at design stage. Self cleaning units on intake structures.	HIGH
Storm Surge / Tide	Damages infrastructure.	Coastal.	Flood gates at Motueka. Early warning, increased checks and maintenance.	HIGH	Better liaison with civil defence. Planning controls for development.	HIGH
Storm and Tide Surge	Impacts ability to discharge.	Coastal.	Flood gates at Motueka. Early warning, increased checks and maintenance.	HIGH	Better liaison with civil defence. Planning controls for development.	HIGH

These high risks have been generalised at the activity level and do not necessarily apply to every site. The following clarification is provided on current controls for each high risk event shown above.

- Landowners – Council engages with affected landowners at the earliest possible stages of design to ensure their input to proposed solutions and agree land entry and or land purchase agreements.
- Iwi – The Council's professional services consultant (MWH New Zealand Ltd) has an Iwi Liaison Representative who attends regular meetings with Tiakina te Taiao. The Representative also attends meetings and facilitates consultation on an as-needed basis with Nga ti Kuia, Nga ti Toa Rangatira, Manawhenua ki Mohua in Golden Bay, and Ngai Tahu in Murchison.
- Natural Hazards – Council's professional services consultant (MWH New Zealand Ltd) monitors weather warnings and dispatches the operation and maintenance contractor to do pre-storm checks on critical open channel assets, inlets, and outlets. Council has also taken account of potential climatic changes in the recent update of its Engineering Standards and Policies 2008 to ensure all new assets have sufficient capacity in the future.

Q.2.3. Level 3 – Critical Assets Risk Assessment

Critical assets and those assets considered to be significant within each stormwater scheme have been identified. A high level risk assessment was undertaken to determine the issues arising from each asset group (not individual asset) 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-7 lists the critical and significant assets for each stormwater 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: Significant Assets Level 3 Assessment (following)

Key	Measure to be considered
	Measure in place
	No measure in place - not necessary
	No measure in place - Project needed

Catchment	Asset Type	Critical or Significant Asset	Project ID	Project Name	Containment/ Storage	Telemetry System	Buried/ Covered Asset	Spill Kits	Water Quality Improvements	Secondary Spillway / Outlet	Secondary Flowpath	Resolve land agreements	Interception	Improve Capacity	Health and Safety	Pre-flood inspections	Proactive Maintenance / Renewal	As Built Records	Detention Dam Certification	Call Centre	Asset Management System/ Confirm	Emergency Evacuation Plans (Civil Defense)	Hydraulic Model	Stormwater Catchment Management Plans	Environmental Monitoring	Regulatory Consents	Engineering Standards
District	All	All	59	Data Capture of outlets to open channels																							
			55	Data Capture																							
			61	Policy Statement on Private Bridges																							
			81	Stormwater Bylaw																							
			87	Land Acquisition project																							
			92	Asset Safety Review																							
Richmond	General Catchment		79	Discharge Consent																							
			80	Quality Improvements																							
			75	Hydraulic model																							
	Detention Ponds	Olympus Way																									
		Cemetry Dam																									
		Blair Terrace																									
		Washbourne Gardens																									
		Bill Wilkes Reserve																									
		Lodestone Road	31	Lodestone Park																							
		Reservoir Creek																									
	Distribution Systems (piped)	Oxford Street	33	Oxford Street																							
		Queen Street	36	Queen Street																							
		Park Drive	34	Park Drive upgrade																							
		Salisbury Road	73/76	Salisbury Rd Roundabout																							
		Gladstone Road	35	Poutama Drain																							
	Distribution Systems (open)	Reservoir Creek																									
		Jimmy Lee Creek																									
		Blair Terrace Drain	43	Surrey Road																							
		Poutama Drain	35	Poutama Drain Culvert																							
		Eastern Hills Drain																									
		Whites Drain																									
		Borck Creek	25/26/28	Borcks Creek Widening																							
			45	Land Purchase																							
		Beach Road Drain	23	Beach Road Upgrade																							
Brightwater	General Catchment		122	Discharge Consent																							
			60	Catchment Management Plan																							
	Distribution Systems (open)	Jeffries Creek																									
		Railway Reserve Drain	2	Mt Heslington Drain Diversion																							
		Ellis Street Drain																									
	Other Structures	Underpass PS																									
Wakefield	General Catchment		135	Discharge Consent																							
			a	Catchment Management Plan																							
	Detention Ponds	Eden Detention Dam																									
	Distribution Systems (open)	Eighty-Eight Valley Drain																									
		Domain Drain																									
		Eden Stream	51	Eden Stream upgrade																							
Murchison	General Catchment		128	Discharge Consent																							
			63	Catchment Management Plan																							
	Distribution Systems (open)	Neds Creek	19	Murchison Rec Centre																							
St Arnaud	General Catchment		131	Discharge Consent																							
			96	Catchment Management Plan																							
	Distribution Systems (open)																										
Tapawera	General Catchment		133	Discharge Consent																							
			84	Catchment Management Plan																							
	Distribution Systems (open)	Totara Street	49	Totara Street Culvert																							
		Cut off Drain																									
	Other Structures	Culvert inlets																									
Motueka	General Catchment		127	Discharge Consent																							
	Detention Ponds	Glenavon Drive Detention Dam																									
	Distribution Systems (open)	Lamas Drain																									
		Staples Drain																									
		Parker Street	68	Parker Street Upgrade																							
		Woodlands Drain																									
		Thorpe Drain	87	Land Aquistion Project																							
	Other Structures	Wharf Road Tide Gate	17	Tidal Gate Renewal																							
		Old Wharf Road Tide Gates	17	Tidal Gate Renewal																							
		Various Outlet Structures	12	Flap Gates Refurbish																							
Mapua/Ruby Bay	General Catchment		126	Discharge Consent																							
			114	Catchment Management Plan																							
	Detention Ponds	Crusader Drive Dam																									
	Distribution Systems (open)	Morley Drain																									
		Toru Street Drain	89	Toru Street drain improvements																							
		Seaton Valley Drain	83/84	Seaton Valley Stream Widening																							
		Crusader Drive	66	Crusader Drive Drainage improvements																							
	Other Structures	outlets																									
Tasman	General Catchment		134	Discharge Consent																							
			115	Catchment Management Plan																							
	Distribution Systems (open)	Main Road Ditch	60	Daldwin Road																							
Kaiteriteri	General Catchment		124	Discharge Consent																							
			116	Catchment Management Plan																							
	Distribution Systems (piped)	Camp beach outlet pipe	5	Motorcamp Outlet Pipe																							
	Distribution Systems (open)	Rowling Road drain																									
Takaka	General Catchment		132	Discharge Consent																							
			117	Catchment Management Plan																							
	Distribution Systems (open)	Various	46/47/48	New Stormwater Pipes																							
		Motupipi Street - Motupipi river																									
Pohara	General Catchment		21	Pohara Main Settlement upsizing																							
			130	Discharge Consent																							
			118	Catchment Management Plan																							
	Distribution Systems (open)	Watino Place																									
Ligar Bay/Tata Beach	General Catchment		125	Discharge Consent																							
			119	Catchment Management Plan																							
	Distribution Systems (piped)	Cornwell Place																									
	Distribution Systems (open)	Abel Tasman Drive	6	Abel Tasman Drive Culvert																							
Collingwood	General Catchment		123	Discharge Consent																							
			120	Catchment Management Plan																							
	Distribution Systems (piped)	Beach Road outlets																									
	Distribution Systems (open)	Ruataniwha Drive																									
		Lewis St Drain																									
		Swiftsure Street																									
		Gibbs Road	3	Gibbs Road Diversion																							
Patons Rock	General Catchment		129	Discharge Consent																							
			121	Catchment Management Plan																							
	Other Structures	Outlets to beach																									

Q.2.4. Projects to Address Risk Shortfalls

The specific risk mitigation measures that have been planned within the 20 year water programme include:

- catchment modelling
- proactive maintenance ahead of bad weather
- improved security of manholes and stormdrains
- assessment of new sub-divisions for secondary flow-paths.

Q.2.5. Asset Insurance

Tasman District Council is a member of The Local Authority Protection Programme Disaster Fund (LAPP) which is a mutual pool created by local authorities to cater for the replacement of infrastructure following catastrophic damage by natural disaster. All member authorities undergo a full risk management assessment programme. As a result, high risk exposures are identified and remedial action taken to help reduce the potential drain on the Fund and to minimize the impact on communities.

The Fund is designed to cover local authority owned infrastructural assets. These include storm water drainage and dams.

The Fund is designed as catastrophe protection only, covering serious disruptive loss or damage caused by sudden events or situations which may or may not involve the declaration of a Civil Defence Emergency. Perils include but are not necessarily limited to earthquake, storms, floods, cyclones, tornados, volcanic eruption, tsunami and other disasters of a catastrophic nature such as a major gas explosion.

Central government will pay 60% of restoration costs. Council use their General Disaster Fund is used to fund the balance of restoration costs.

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

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.

The following critical assets were identified in the Vulnerability Assessments at Critical Risk in the Lifelines report.

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 stormwater services in the event of a major emergency or natural hazard event.

- Council have limited business continuity plans that were developed around influenza pandemic planning in 2006.
- Council's stormwater contractors have up to date Health and Safety Plans in place.
- Council's professional services consultant (MWH Ltd) have 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 stormwater 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 stormwater 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 Stormwater 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 Well-beings, 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.		Community support services	• Community facilities • Emergency management • Community housing • Governance
Our communities engage with Council's decision-making processes.			
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.

Table R-2 following describes how the stormwater activities contribute to the Community Outcomes.

Table R-2: How the Stormwater Activities Contribute to Community Outcomes

Community Outcomes	How Our Stormwater Activity Contributes to the Community Outcome
Our unique natural environment is healthy and protected.	Stormwater arising within urban development areas is controlled, collected, conveyed and discharged safely to the receiving environment. This activity can be managed so the impact of the discharges does not adversely affect the health and cleanliness of the receiving environment.
Our urban and rural environments are pleasant, safe and sustainably managed.	Our stormwater activity ensures our built urban and rural environments are functional, pleasant and safe by ensuring stormwater is conveyed without putting the public at risk or damaging property, businesses or essential infrastructure.
Our infrastructure is safe, efficient and sustainably managed.	The stormwater activity is considered an essential service that should be provided to all properties within urban drainage areas in sufficient size and capacity. 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 stormwater 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 stormwater 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 stormwater 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?

There are many factors that need to be considered when deciding what level of service the Council will aim to provide. These factors include:

- Council needs to aim to understand and meet the needs and expectations of the community
- Council must meet its statutory obligations
- the services must be operated within Council policy and objectives and
- the community must be able to fund the level of service provided.

Two tiers of levels of service are outlined, Strategic and Operational.

The operational levels of service and performance measures are used to ensure the service and facilities are able to achieve the strategic levels of service and Councils objectives.

Level of services need to be reviewed and upgraded on a continuous basis in line with legislative and regulatory changes and feedback from customers, consultation, internal assessments, audits and strategic objectives

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 AMPs. They take in account feedback from various parties including Audit New Zealand, industry best practice and ease of measuring and reporting of performance measures.

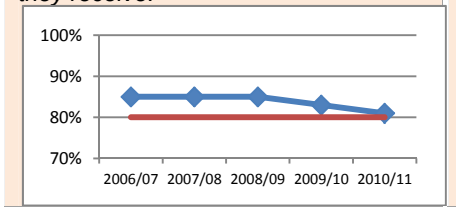
Council has decided to reduce the number of levels of service reported in the LTP, showing only those that are considered to be customer focussed. The AMP extends the levels of service and performance measures to include the more technical measures associated with the management of the activity.

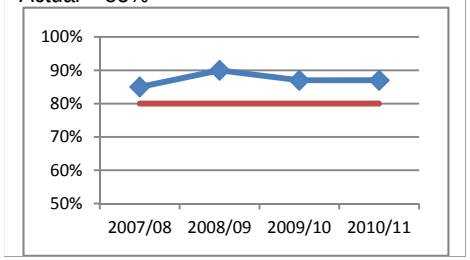
Table R-3 details the levels of service and associated performance measures for the stormwater activity. Those shaded are the customer focussed measures which are included in the LTP. The table sets out Councils current performance and the targets they aim to achieve within the next three years and by 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.

Table R-3: Performance against Current Levels of Service, and Intended Future Performance

ID	Levels of Service (we provide)	Performance Measure (We will know we are meeting the level of service if…...)	Current Performance	Future Performance			Future Performance (targets) in Years 4-10
				Year 1	Year 2	Year 3	
Community Outcome: Our unique natural environment is healthy and protected.							
1	Our stormwater systems do not adversely affect or degrade the receiving environment.	*Council has resource consent in place for each of the 16 stormwater UDAs.* *Resource consents are held in Council's Confirm database.*	Actual = Resource consents will be obtained once a Stormwater Catchment Management Plan has been developed for each UDA.	*0*	*1 / 16 (Richmond)*	*2 / 16 (Richmond and Motueka)*	*16 / 16*
2		We have stormwater UDA management plans (SWCMPs) for each urban drainage area.	Actual = Work has begun on the Stormwater Catchment Management Plan for Richmond. This will be complete and in place by the end of Year 1.	1 / 16 (Richmond)	2 / 16 (Richmond and Motueka)	3 / 16 (Richmond, Motueka and Mapua)	16 / 16
Community Outcome: Our urban and rural environments are pleasant, safe and sustainably managed.							
3	Our stormwater systems collect and convey stormwater safely through urban environments, reducing the adverse effects of flooding on people and residential and commercial buildings.	*There are no public complaints to Council of residential or commercial buildings being flooded as a result of failure of Council stormwater systems to cope with the current design capacity (this excludes capacity from rivers, private drainage failure).* *As measured through complaints received through Council's customer services and recorded in the Confirm database.*	Actual = This is a new measure which is not currently measured. Council needs to ensure this information is adequately recorded in Confirm.	*0*	*0*	*0*	*0*

ID	Levels of Service (we provide)	Performance Measure (We will know we are meeting the level of service if…...)	Current Performance	Future Performance			Future Performance (targets) in Years 4-10
				Year 1	Year 2	Year 3	
4		Existing systems are capable of containing a 1 in 5 year storm event.	Actual = The table below shows the % of areas currently capable of containing a 1 in 5 year storm. This table will be reassessed on a three yearly basis. UDA — ≥ 1 in Year Storm Richmo d — 80% Brightwater — 70% Wakefield — 60% Murchison — 40 St Arnaud — 80% Tapawera — 90% Motueka — 80% Mapua/Ruby Ba — 90% Tasman — 60% Kaiteriteri — 80% Takaka — 70% Pohara — 40% Ligar Bay/Tata Beach — 70% Collingwood — 70% Patons Rock — 30% Average — 67%	75%	75%	75%	100%
Community Outcome: Our stormwater and essential services are sufficient, efficient and sustainably managed.							
5	Our stormwater activities are managed at a level which satisfies the community.	*% of customers satisfied with the stormwater service.* *As measured through the annual resident survey.*	*Actual = 81%* *The Communitrak™ residents survey was undertaken in May/June 2011. 81% of receivers of the service were found to be satisfied with the service they receive.* 	*80%*	*80%*	*80%*	*80%*

ID	Levels of Service (we provide)	Performance Measure (We will know we are meeting the level of service if…...)	Current Performance	Future Performance			Future Performance (targets) in Years 4-10
				Year 1	Year 2	Year 3	
6		*Number of complaints relating to health nuisance (odour, mosquitoes, noise…).* *As measured through complaints received through customer services and recorded in the Confirm database*	Actual = This is a new measure which is not currently measured. Council need to ensure this information is adequately recorded in Confirm.	*<10 complaints*	*<10 complaints*	*<10 complaints*	*<10 complaints*
7	We have measures in place to respond to and reduce flood damage to property and risk to the community within stormwater UDAs.	*% of faults responded to within Contract time frames. (eg. Priority = clear obstructions in stormwater system 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. This is monitored through Contract 688.*	*>90%*	*>90%*	*>90%*	*>90%*
8		All open drains are maintained in a flood ready state As measured through audits undertaken by the Engineer.	Actual = 88% 	80%	80%	80%	80%
9		Critical stormwater assets are maintained in a flood ready state and checked prior to any event in which weather warnings are notified. As recorded through audits carried out by the Contract Engineer.	Actual = Critical assets are identified and assessed for Risk. Where mitigations measures are required, they have been included for action in the AMP.	100%	100%	100%	100%

R.5 What Plans Have Council Made to Meet The Levels of Service?

Council is making a capital works investment of approximately $56 million over the next 20 year period to upgrade existing stormwater assets to improve levels of service in the stormwater system.

In preparing the future financial forecasts, Council has included the following specific initiatives to meet the current or intended future Levels of Service:

- upsizing pipelines and widening open channels to improve capacity
- obtaining resource consents for stormwater discharges
- realignment projects to improve system performance
- installation of new infrastructure to improve capacity
- sump and soak hole improvements.

Please refer to Appendix F for specific projects.

R.5.1. Levels of Service Linked to Legislation

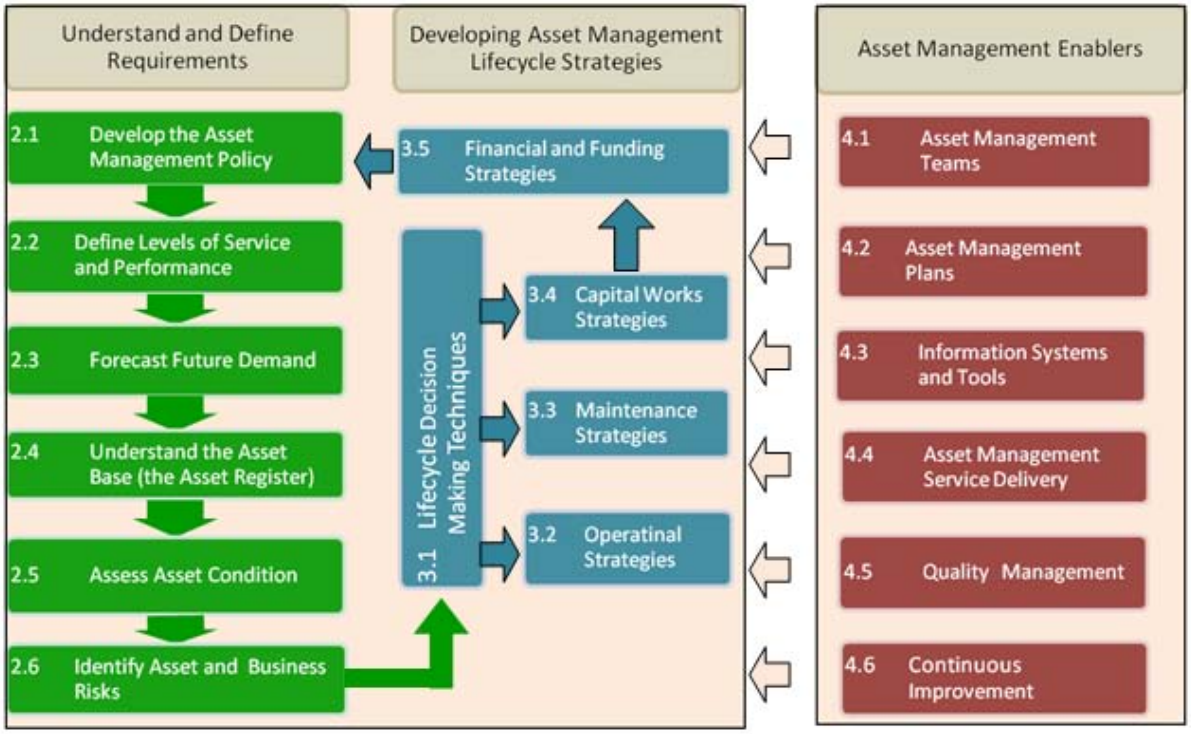
Whilst Council are required to comply with various legislation and regulations when managing the stormwater activity, no specific levels of service are included which relate to legislation.

APPENDIX S COUNCIL'S DATA MANAGEMENT, ASSET MANAGEMENT PROCESSES AND SYSTEMS

S.1 S1 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 Council's 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. 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.

Upon completion of the process, Council has set **Core Plus** as the target level at which they want to be managing the Stormwater 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 Stormwater 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 Stormwater Activity Management Processes, MWH 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 than 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, priorities 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 following.

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. Valuation 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	Council's Asset Register is held in Confirm. It contains information on asset extent, age, remaining life, condition etc. Asset hierarchy capability is available in Confirm but Council do not see the need to implement this function at this stage.	2	2
	Customer Service	All customer enquiries and service requests are logged and can be assigned, tracked and analysed. The Customer Service Requests help drive the day to day reactive maintenance programme.	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 Contractor's SETI system. Council intend to migrate this historical data into a SQL database accessible from Confirm. Tracking repairs and response times is carried out and reported to ensure key performance measures are being achieved.	3	3
	Asset Condition data	Condition data on non-pipe assets at major installations is collected through the maintenance contract on a three yearly basis, the most recent being in 2011/12. Asset condition data is also collected through the maintenance contract when undertaking works at an installation or asset.	2	2
	Historical data	Confirm holds data on jobs and maintenance for approximately five years. This allows the interrogation of the system for historical data on specific assets.	2	2
	Asset Performance	A significant amount of asset performance data relating to assets such as flow meters and pumps is collected on a regular basis by Council's contractors and consultants. This information has previously been held in other information systems but is now being recorded into Confirm.	2	2
	Critical Assets	The critical assets have been identified as part of the Activity Management Plan process and are shown in Appendix Y as part of the schematics and are also covered in Appendix Z in relation to risk assessments. These assets have not yet been separately identified within Councils Confirm system. There is an item in the Improvement Plan to ensure that the critical assets are separately identified with Confirm to allow easier assessment and reporting.	n/a	0
	Valuation	Council now undertakes it Asset Valuations through the Confirm system.	2	2

Information System	Data Type	Management Strategy	Data Confidence	
			Accuracy	Completeness
Infonet	CCTV	CCTV results and reports are currently stored on DVD and held by MWH. Council are in the process of establishing Infonet as a suitable repository for CCTV information to aid in their optimised decision making process for renewals prioritisation.	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 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.	n/a	n/a
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
Hilltop	Environmental Monitoring	Holds records and results of consent monitoring for wastewater treatment plants and for resource recovery centres. Hilltop is not suitable for viewing, managing or manipulating data, so this is done through alternative software.	2	2
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
Growth Model Database	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

Information System	Data Type	Management Strategy	Data Confidence	
			Accuracy	Completeness
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.	2	2
	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 (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 stormwater 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 history where all pipe breaks are located by GPS to allow mapping on an annual basis to establish trends
- operator knowledge.

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 in Table S-4.

Table S-4: Asset Management Strategies Summary

Strategy	Processes and Systems
Renewals Management (Appendix I)	• Renewals first identified from valuation data base – 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.
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 CCTV, hydraulic modelling, demand management.

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 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 stormwater 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 were last reviewed.

There are no bylaws of direct relevance in to this activity.

Provision has been made in the Operations budget to develop a Stormwater Bylaw in conjunction with next bylaw review in Year 6, refer to Appendix E for further information. The purpose of this bylaw will be to give Council power to meet anticipated resource consent conditions relating to discharge quality.

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	Environmental sustainability Risk mitigation
Regulatory	Compliance
Service providers / suppliers	Customer service Reliability / responsiveness
Council internal	Compliance Risk mitigation
Elected members	Customer Service
Media	Customer Service
Approval 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[12] (NRB), but more recently on an annual basis. These Communitrak™ surveys assess the levels of satisfaction with key services, including stormwater 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 stormwater 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 Error! Reference source not found.

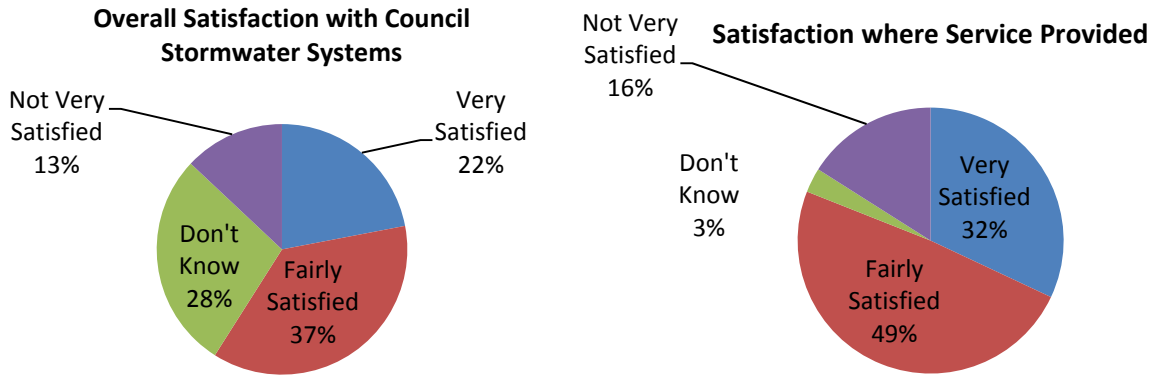


Figure U-1: Customer Satisfaction with Council Stormwater

A large proportion (28%) were unable to comment on their satisfaction with Council's stormwater services. This is likely to be due to the fact that 43% of residents interviewed are not provided with a piped stormwater collection service.

Figure U-2 shows that customer satisfaction levels with the stormwater service have declined since 2008. The overall satisfaction level has decreased since 2008 from 63% to 59%. This is less than Council's Peer Group average (65%) and below the National Average (78%). For the people that are serviced by a Council stormwater system the level of satisfaction is 81%, a decrease from 2008 of 4%.

[12] Communitrak™: Public Perceptions and Interpretations of Council Services / Facilities and Representation, NRB Ltd May/June 2011.

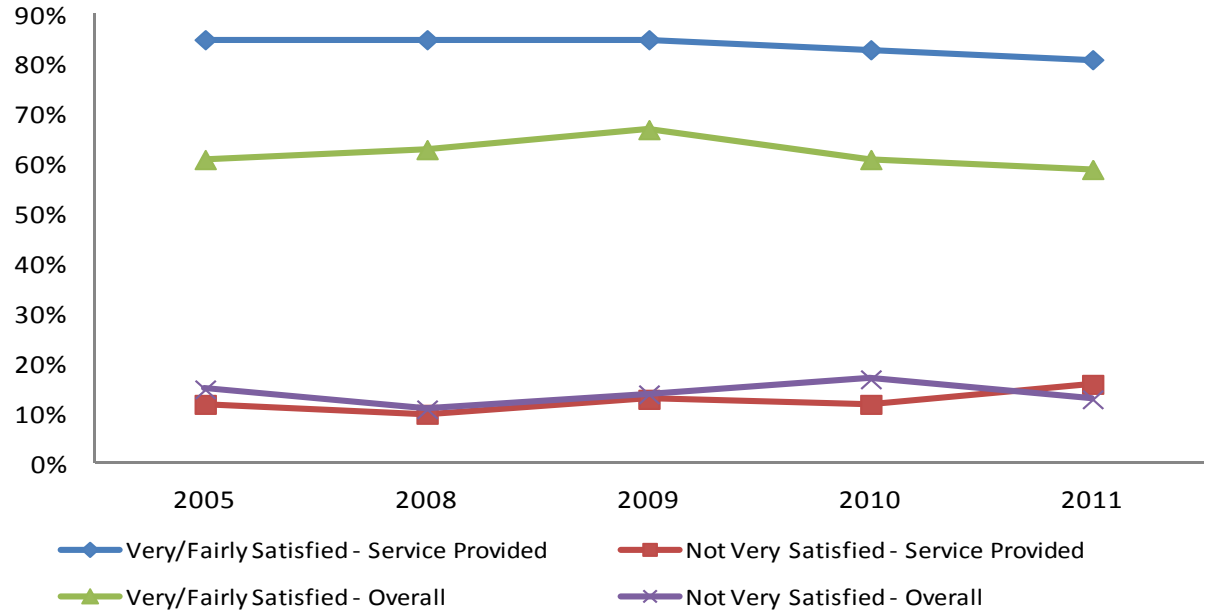


Figure U-2: Satisfaction with Stormwater

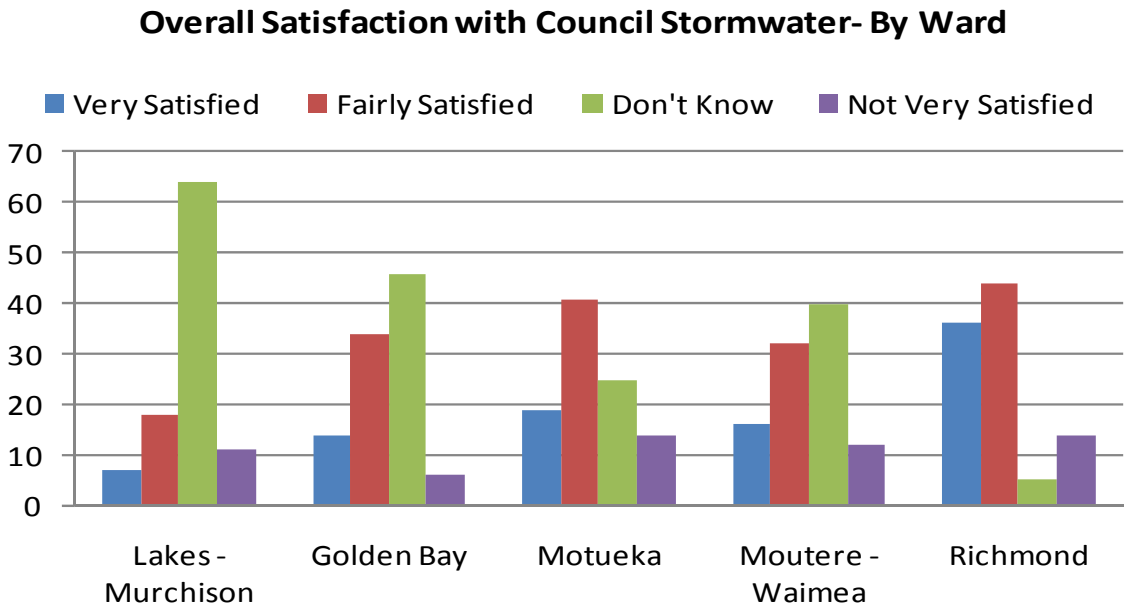


Figure U-3: Overall Satisfaction by Ward

The main reasons residents are not very satisfied with stormwater services are:

- flooding / surface flooding
- drains / culverts blocked / need cleaning
- poor drainage / inadequate system / needs upgrading / improving.

When asked whether they would like more to be spent, less, or about the same for stormwater service provision, 85% said they would like to see the same or more (given that Council cannot spend more without increasing rates or user charges). This is shown in Figure U-4 and compared to previous results.

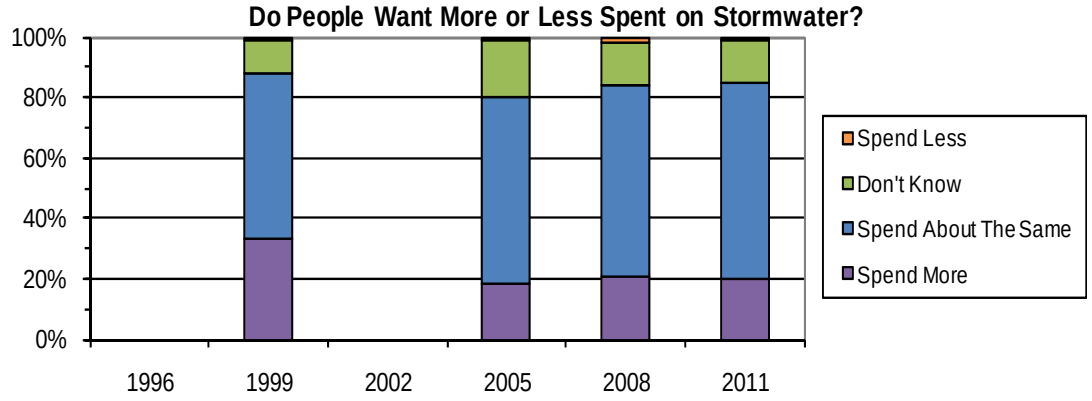


Figure U-4: More or Less Spending on Stormwater

This shows that few people want to spend less, and most want to spend the same or more.

Overall, the survey shows that:

- residents connected to Council stormwater services are satisfied with the service received and are comfortable with the cost relative to the level of service provided
- a small number of people want to spend less on stormwater services
- the percent not very satisfied (13%) is on a par with the Peer Group Average and the National Average.
- 20% want more spent on stormwater knowing that this will mean higher charges
- there is a lower level of satisfaction with Council's stormwater service when residents not on a Council scheme are considered.

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 in the following figure (Figure V-1) for this activity. Overall the targeted level (hollow bars) of improvement has been achieved or exceeded (results are shown as solid colour bars).

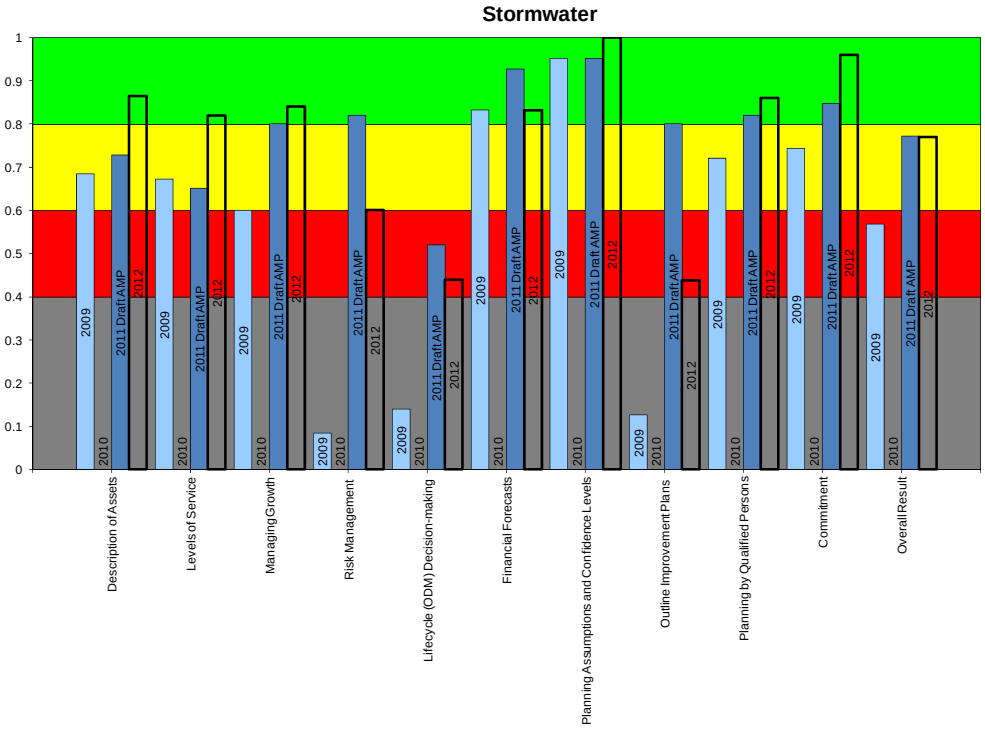


Figure V-1: Results of Benchmarking Review on Draft AMP

The methodology and the findings from the review are detailed in a separate report (*Performance Review of Stormwater Activity Management Practices*; MWH, 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 review processes 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 Table V-1 below, and are split by the year that they were identified.

Table V-1: Status of Improvement Items

Count of AMP Action Reference	Column Labels			
Row Labels	In Progress	Not Started	Complete	Grand Total
2009	**9**	**5**	**2**	**16**
1 - Description of Assets	2	1		3
2 - Levels of Service		3	1	4
3 - Managing Growth	1			1
4 - Risk Management			1	1
5 - Lifecycle (Optimised) Decision-making	3			3
6 - Financial Forecasts	1	1		2
10 - Commitment	2			2
2010	**6**	**2**	**19**	**27**
1 - Description of Assets	1	1	5	7
2 - Levels of Service	2		2	4
3 - Managing Growth	1		1	2
4 - Risk Management			1	1
5 - Lifecycle (Optimised) Decision-making	1		3	4
7 - Planning Assumptions & Confidence Levels			1	1
8 - Outline Improvement Programmes	1			1
9 - Planning by Qualified Persons		1	1	2
10 - Commitment			5	5
2011		**31**		**31**
1 - Description of Assets		2		2
2 - Levels of Service		1		1
3 - Managing Growth		4		4
4 - Risk Management		5		5
5 - Lifecycle (Optimised) Decision-making		13		13
6 - Financial Forecasts		2		2
8 - Outline Improvement Programmes		2		2
9 - Planning by Qualified Persons		1		1
(blank)		1		1
Grand Total	**15**	**38**	**21**	**74**

V.7 Improvement Actions Completed

Improvement items completed for the period (or requiring no future action) are shown in Table V-2 following.

Table V-2: Improvement Actions Completed

AMP Action Reference	Improvement action	Further Information	Status	Year Improvement Action 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	2010
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	2010
A.004	Links to Activity Related Plans: Improve documentation in the AMP of linkages to other related strategies.	Due for Draft version complete by Oct 2011	Complete	2010
A.005	Links to Other Council Plans: There are clear linkages to the Water and Wastewater AMPs 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	2010
A.006	Links to Other Council Plans: Document linkages to procurement policies in the AMP.	Documenting - standard paragraph detailing AMP links to procurement policies	Complete	2010
B.001	Asset Renewals: Add a one-liner to Appendix B under each scheme to document that there are no renewal projects that have been deferred in the 20 year period of this plan.	Due for Draft version complete by Oct 2011	Complete	2010
E.002	Regular Safety Audits: Records available for inspection - contractor's maintenance schedule		Complete	2009
E.004	Maintenance: List the relevant maintenance standards and specifications in Appendix E of the AMP.	Due for Draft version complete by Oct 2011	Complete	2010
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	2010
I.001	Asset Renewals: Improve documentation of the framework for renewals in the AMP.	Due for Draft version complete by Oct 2011	Complete	2010
I.002	Asset Renewals: Improve documentation of how renewals are delivered.	Due for Draft version complete by Oct 2011	Complete	2010
N.002	Demand management: Detail the new capital projects in the AMP.	Due for Draft version complete by Oct 2011	Complete	2010
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.	Combined project for Organisational IRM, also need to develop at Ops level per activity	Complete	2009
Q.002	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.	Due for completion August 10 - Activity Level	Complete	2010
R.002	LOS Development: Document how LOS have been developed internally within Council in the AMP (currently stated in LTCCP).		Complete	2010
R.003	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	2010
S.004	ODM Approach: Formalise and document the processes for decision making in the AMP.		Complete	2010
S.005	ODM Tools and Techniques: Improve and document the processes for selection of pipe material in the AMP.		Complete	2010

AMP Action Reference	Improvement action	Further Information	Status	Year Improvement Action Identified
S.006	ODM Integration: Document the links between ODM decision making in cross-infrastructure work planning in the AMP.		Complete	2010
S.007	Asset Systems: Improve documentation of the weaknesses of the asset systems in the AMP.	Due for Draft version complete by Oct 2011	Complete	2010
Z.001	AMP Development: Document in the AMP all the departments who provided input to the AMP (eg. Finance).	Documenting - Standard paragraph on AMP development and input	Complete	2010

V.8 Current Improvement Actions

Current improvement actions are detailed in the table below:

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 Years 1 - 3
A.001	**AMP Update:** Review and update AMP on a 3 year cycle. Next due in 2014.	Financial provision made in the O&M budget.	H	In Progress	2009	End Oct 14	Consultant	Jeff Cuthbertson	$55,000
C.001	**WSSA:** Identify areas where the community appear to want a higher level of service through completing a Water and Sanitary Services Assessment every three years.	Financial provision made in the O&M budget.	M	Not Started	2009	2016	Consultant	Jeff Cuthbertson	$30,000
C.002	**Condition performance monitoring:** Undertake formal catchment analyses and system capacity assessments in remaining communities and document results in AMP.		M	In Progress	2010	2022	Consultant	Jeff Cuthbertson	$120,000
C.003	**Condition performance monitoring:** Complete condition assessment for remaining rock protection in urban channels and document in AMP.		M	Not Started	2010	2015	Consultant	Jeff Cuthbertson	
D.001	**Asset Valuations:** Review and update the water Asset Valuation on a 2 yearly cycle. Next review due in 2012		H	Not Started	2009	1-Jul-12	Consultant		$15,000
E.001	**Asset Condition Identification:** Completion of CCTV surveys to inspect the internal condition of stormwater pipes and also to continue to complete visual checks on the condition of culverts, other stormwater structures, detention dams etc.	Financial provision made in the O&M budget.	H	In Progress	2009	2015	Consultant	Jeff Cuthbertson	$60,000

E.003	**Stormwater Quality Catchments Management Plans:** Complete monitoring programme to identify current environmental values, identify areas for improvement where stormwater quality is poor. Complete SQCMP for the main urban areas, starting with Richmond.	Financial provision made in the O&M budget.	M	In Progress	2009	2022	Consultant	Jeff Cuthbertson	$120,000
E.005	**Lifecycle Decision Making:** Detail how options have been identified for asset maintenance to achieve optimal costs over life.		H	Not Started	2011	2014	Consultant	Jeff Cuthbertson	
F.002	**Lifecycle Costings:**		L	Not Started	2011	2015	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.		M	Not Started	2011	2014	In-House	Peter Thomson	
H.001	**Detention Dam RMA Consents:** Review Councils Detention Dams to obtain consents required under the RMA, which may include water diversion consent, water retaining structures consent or a building consent	Financial provision made in the O&M budget. Item 15 on the Strategic Studies list	M	Not Started	2009	2011	Consultant	Jeff Cuthbertson	
H.002	**Foreshore Study:** Monitoring water quality in estuarine environments.	Financial provision made in the O&M budget.	M	In Progress	2009	2013	In-house with consultant support	Jeff Cuthbertson	$90,000
K.001	**Financial Assessment:** Explore if Councils policy around debt funding is specific enough.		M	Not Started	2011	2014	In-House	Peter Thomson	
M.001	**Funding for land drainage improvements outside UDAs:** Review methods for funding from Council to upgrade stormwater drainage systems outside UDAs.		L	In Progress	2009	2015	In-house with consultant support	Jeff Cuthbertson	$20,000

N.001	**Demand Management:** Review Council's policy to encourage/require reductions in stormwater runoff from new and existing developments.	To be developed for inclusion in the AMP - start 2010/11	L	In Progress	2009	2016	Consultant	Jeff Cuthbertson	
N.003	**Demand management:-** Provide more detail on demand reduction options in the AMP eg low impact design.		L	In Progress	2010	2015	Consultant	Jeff Cuthbertson	
N.004	**Assess Capacity:** Assess culvert/outlet capacity in Pohara, Collingwood, Takaka, Kaiteriteri, Tasman, St. Arnaud, Motueka.		L	Not Started	2011	2015	Consultant	Jeff Cuthbertson	
N.005	**Demand Management:** Collate historical information on demand to enable demand trending and analysis.		M	Not Started	2011	2014	Consultant	Jeff Cuthbertson	
N.006	**Demand Management**: Provide greater detail on the effects of changing demographics rather than population growth.		M	Not Started	2011	2014	Consultant	Jeff Cuthbertson	
N.007	**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	**System Risk Analysis**		L	Not Started	2011	2015	Consultant	Jeff Cuthbertson	
Q.004	**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	
Q.005	**Risk Management:** Implement IRM across Council. Currently being used within individual activities.		H	Not Started	2011	2014	In-House	Peter Thomson	

Q.006	**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.007	**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.008	**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.009	**Assumptions & Uncertainties:** Identify the uncertainty level of the more significant assumptions and detail the possible effects.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	
Q.010	**Asset Data:** Identify and document process for knowing and updating/reporting on confidence levels of asset condition and performance.		M	Not Started	2011	2014		Jeff Cuthbertson	
Q.011	**Assumptions & Uncertainties:** Identify and state the confidence levels for the growth/demand forecasts.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	
R.001	**Compliance with Levels of Service:** Increased monitoring to record compliance with new levels of service.		H	Not Started	2009	2014	Consultant	Jeff Cuthbertson	$10,000
R.004	**Performance measures:** Identify measures that -are currently not being monitored and start a monitoring programme for them.		H	In Progress	2010	2012	Consultant	Jeff Cuthbertson	$10,000

R.005	**Gap Analysis:** Document the gaps where current LoS is less than the desired LoS that are currently not identified in Appendix R eg. condition of existing receiving environment and assessment of stormwater quality is incomplete and needs to be addressed for resource consent applications. This will be partially addressed through the improvement action to complete Water and Sanitary Services Assessment every three years.		H	In Progress	2010	2014	Consultant	Jeff Cuthbertson	$50,000
R.006	**Levels of Service:** Develop and incorporate sustainability strategies and operations into Levels of Service and performance measures.		L	Not Started	2011	2014	In-house with consultant support	Peter Thomson	
S.001	**Asset Management System Development:** Continue to develop Council's Asset Management System and integration with its related asset information systems, GIS, SilentOne etc.	To be reviewed and progressed by the Asset Information System department	H	In Progress	2009	2015	In-house with consultant support	Jeff Cuthbertson	
S.002	**Stormwater Catchment Management Plans (SCMP) including hydraulic modelling:** Hydraulic modelling of stormwater systems is planned to be completed for Council's major urban areas (Richmond and Motueka).	Financial provision made in the O&M budget.	M	In Progress	2009	2011	Consultant	Jeff Cuthbertson	
S.003	**Decision Making & Prioritisation:** Use results of hydraulic models to assess criticality of stormwater assets to improve prioritisation for renewals and document this in AMP.	Link to hydraulic modelling projects	H	In Progress	2010	2015	Consultant	Jeff Cuthbertson	$50,000
S.008	**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.		M	Not Started	2010	End Oct 11	Consultant	Jeff Cuthbertson	

S.009	**CSR Recording:** Start collecting UDA against CSRs to allow easier analysis of issues.		L	Not Started	2011	2015	in-house	Jeff Cuthbertson	
S.010	**Description of Assets:** - consider adding asset hierarchy into the Confirm system. The capabilities are there, but not yet used by Council.		M	Not Started	2011	2014	In-House	Peter Thomson	
S.011	**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.012	**Critical Assets:** Create ability to separately identify Critical Assets in Confirm. Be able to report on this information easily.		M	Not Started	2011	2014	In-house	Jeff Cuthbertson	
S.013	**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.014	**Asset Condition Data:** Detail how asset condition is monitored and reported for key asset types.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	
S.015	**Asset Performance Data:** Detail how asset performance is monitored and reported for key asset types.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	
S.016	**Lifecycle Decision Making:** detail and demonstrate how trade-offs are made between renewals and maintenance expenditure.		M	Not Started	2011	2014	Consultant	Jeff Cuthbertson	
S.017	**Lifecycle Decision Making**: show alignment with maintenance plan for auditing, supervision and performance measures.		M	Not Started	2011	2014	In-house with consultant support	Jeff Cuthbertson	
T.001	**Stormwater Bylaws:** Review the need for a stormwater bylaw.	review priority at AMP update	L	In Progress	2009	2014	In-house	Jeff Cuthbertson	
U.001	**Public Information Brochure:** Produce handouts or post information on the website showing a concise summary of Council's ownership of stormwater assets.		M	Not Started	2009	2015	In-house with consultant support	Jeff Cuthbertson	$15,000

V.001	**Gap Analysis and Improvement Programme:** Improve this improvement programme particularly: timelines, required resources and approval of resources.		M	In Progress	2010	2015	In-house	Jeff Cuthbertson	
V.002	**Improvement Plans:** formalise timeframes and budgets for improvement actions.		M	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.9 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.

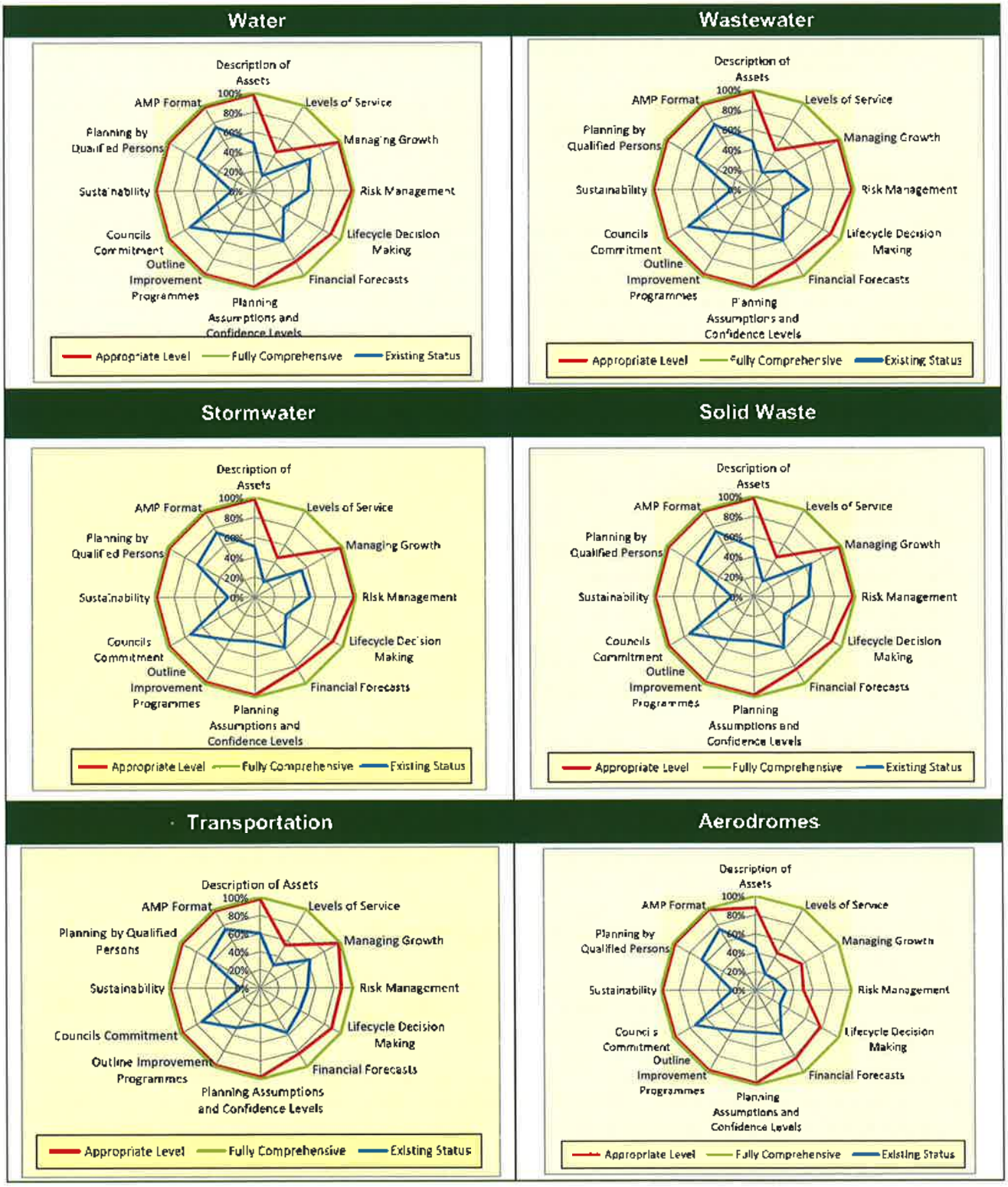
The AMP's provided in May 2012 indicates that many of the issues raised in the October review have been addressed in the subsequent version of the AMPs as amendments or improvement plan items. Competition of these actions would assist to achieve the Councils targeted asset management level.

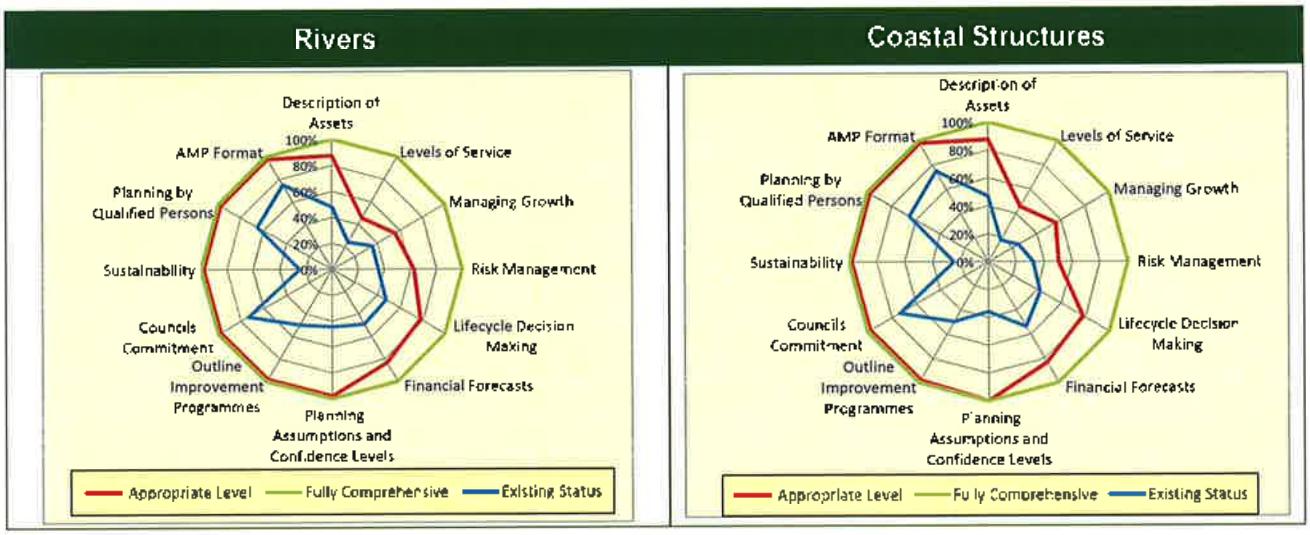
The AMPs assessed in May 2012 do provide Council with an adequate basis on which to make decisions between competing priorities for infrastructure funding and to understand the impact on

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
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- Risk Management
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- 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

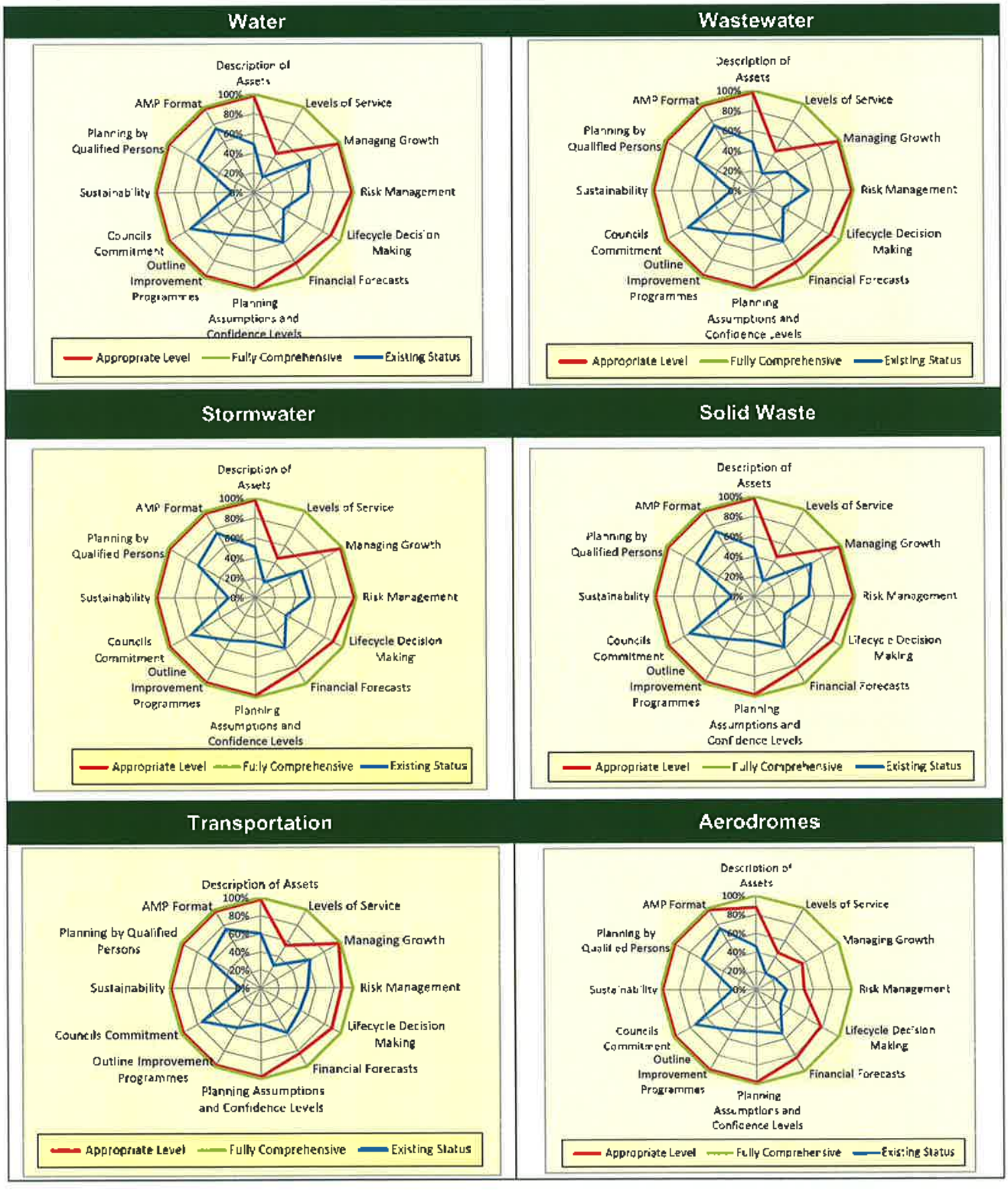
Asset and activity with appropriate AM practice set as Core. An important Council activity with relatively minor expenditure. AMP weakness in asset description, levels of service, managing growth and asset lifecycle decision making are reflective of the entire AMP suite and the template approach.

Table 5-1: AMP Compliance Status

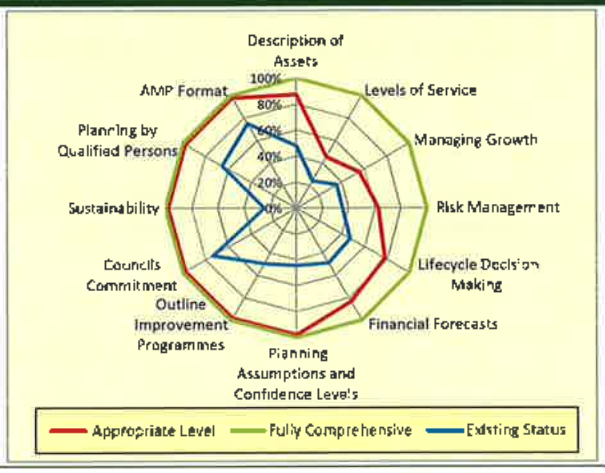
Service		Description of Assets	Levels of Service	Managing Growth	Risk Management	Lifecycle Decision making	Financial Forecasts	Planning Assumptions & Confidence Levels	Outline Improvement Programmes	Councils Commitment	Sustainability	Planning by Qualified Persons	AMP Format
Water	Existing Status	49%	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

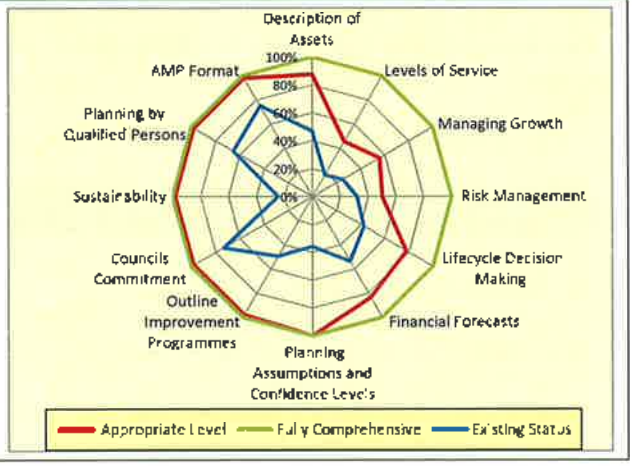
Figure 5-1: AMP Compliance Status Graphs



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 a formal strategy on 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 other 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.

W.3 Forecast Asset Disposals

There are currently no significant stormwater assets programmed for disposal.

APPENDIX X GLOSSARY OF ASSET MANAGEMENT TERMS

Abbreviations and Acronyms

AMP	Activity Management Plan
LGA	Local Government Act
LTP	Long Term Plan
PS	Pump Station
TRMP	Tasman Regional Management Plan
RMA	Resource Management Act
TDC	Tasman District Council
UDA	Urban Drainage Area
WSSA	Water and Sanitary Services Assessments

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.

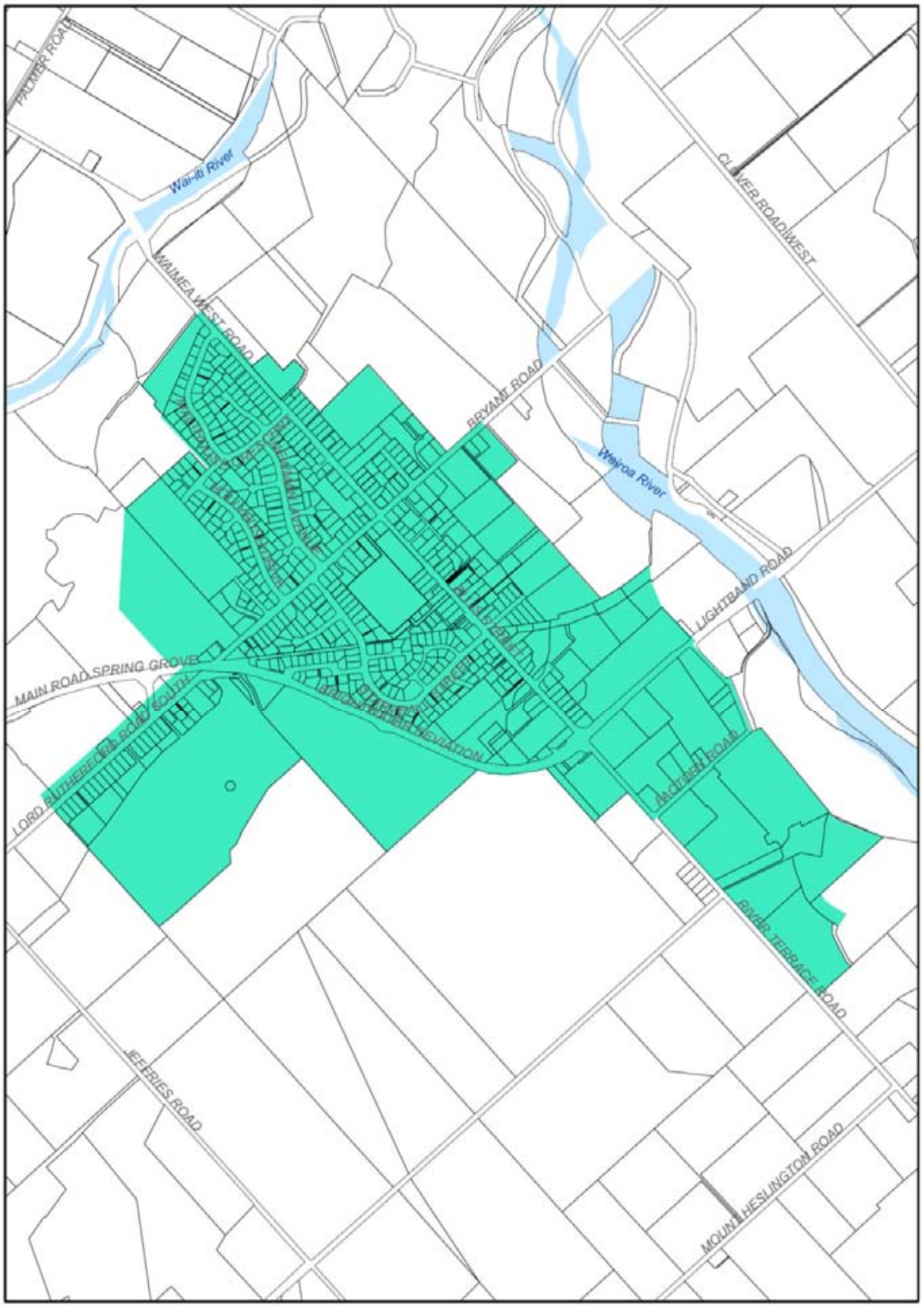
Long Term Plan (LTP)	The Long Term Plan (LTP) is the primary strategic document through which Council communicates its intentions over the next 10 years for meeting community service expectations and how it intends to fund this work. The LTP is a key output required of Local Authorities under the Local 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 STORMWATER UDA BOUNDARIES

The area boundaries are correct as at July 2012. The boundaries are revised periodically.

The current version is located in the LTP.

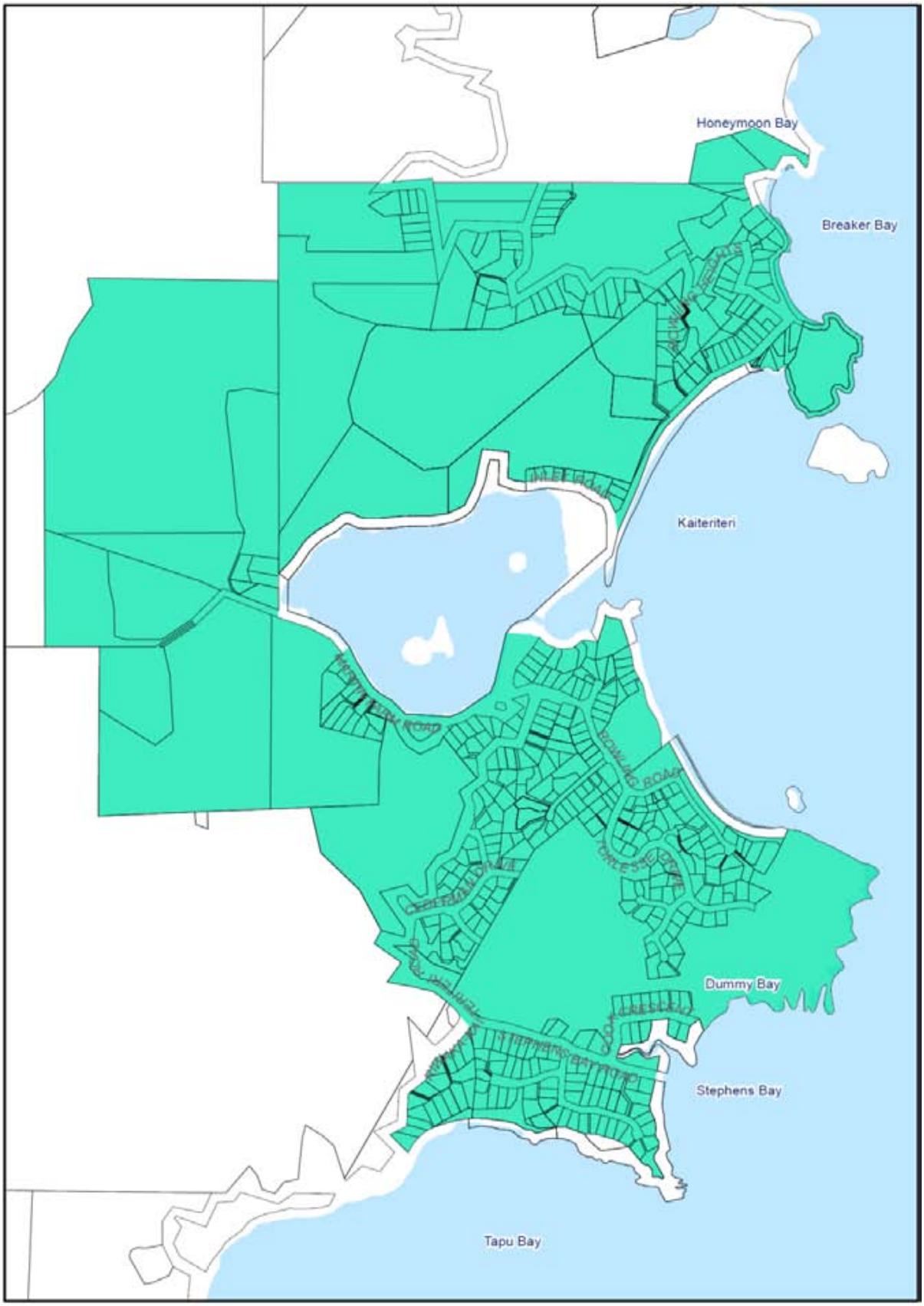


Brightwater
Stormwater Urban Drainage Rating Area

0 325 650 975 1,300 m

N

1:13,500

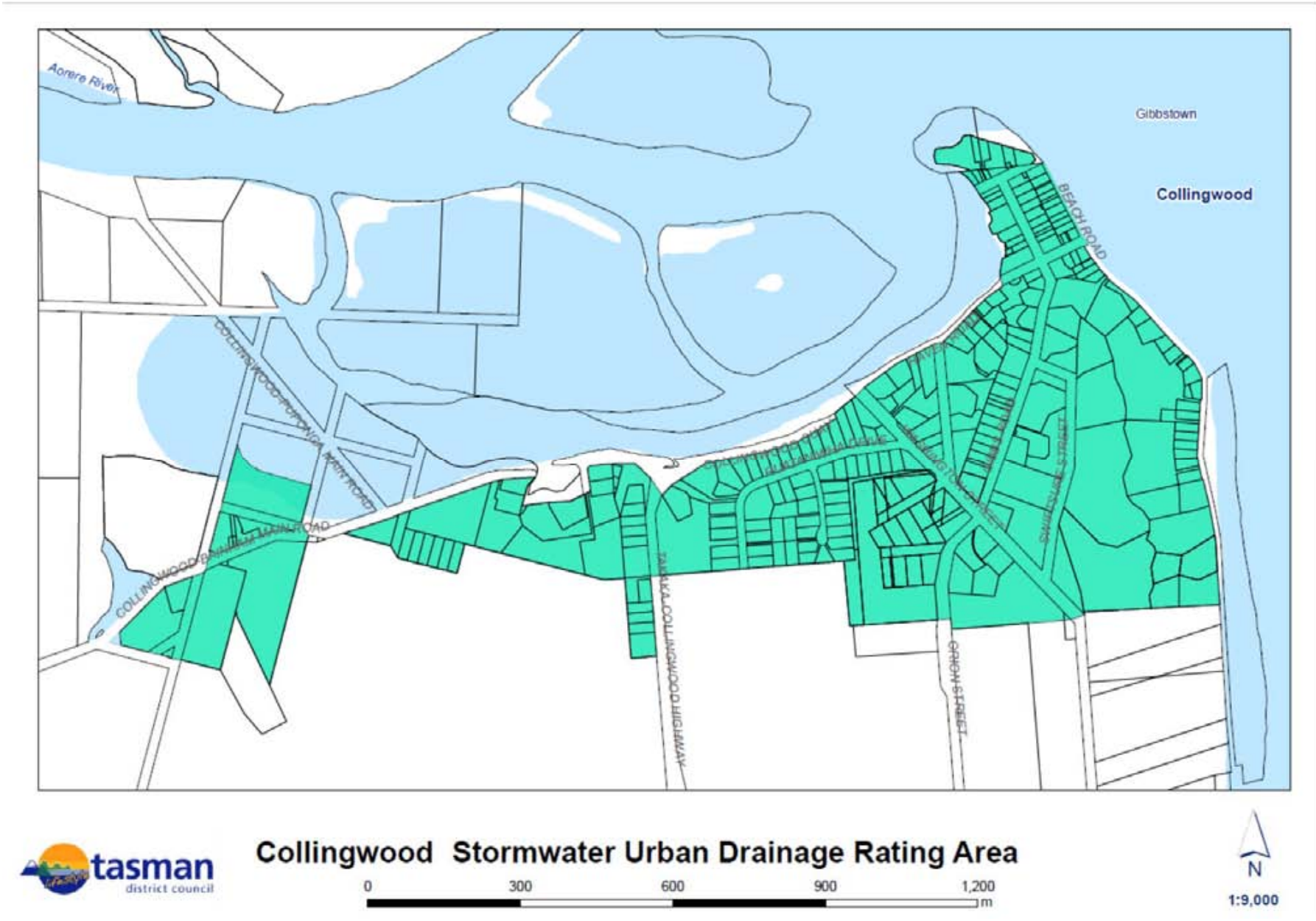


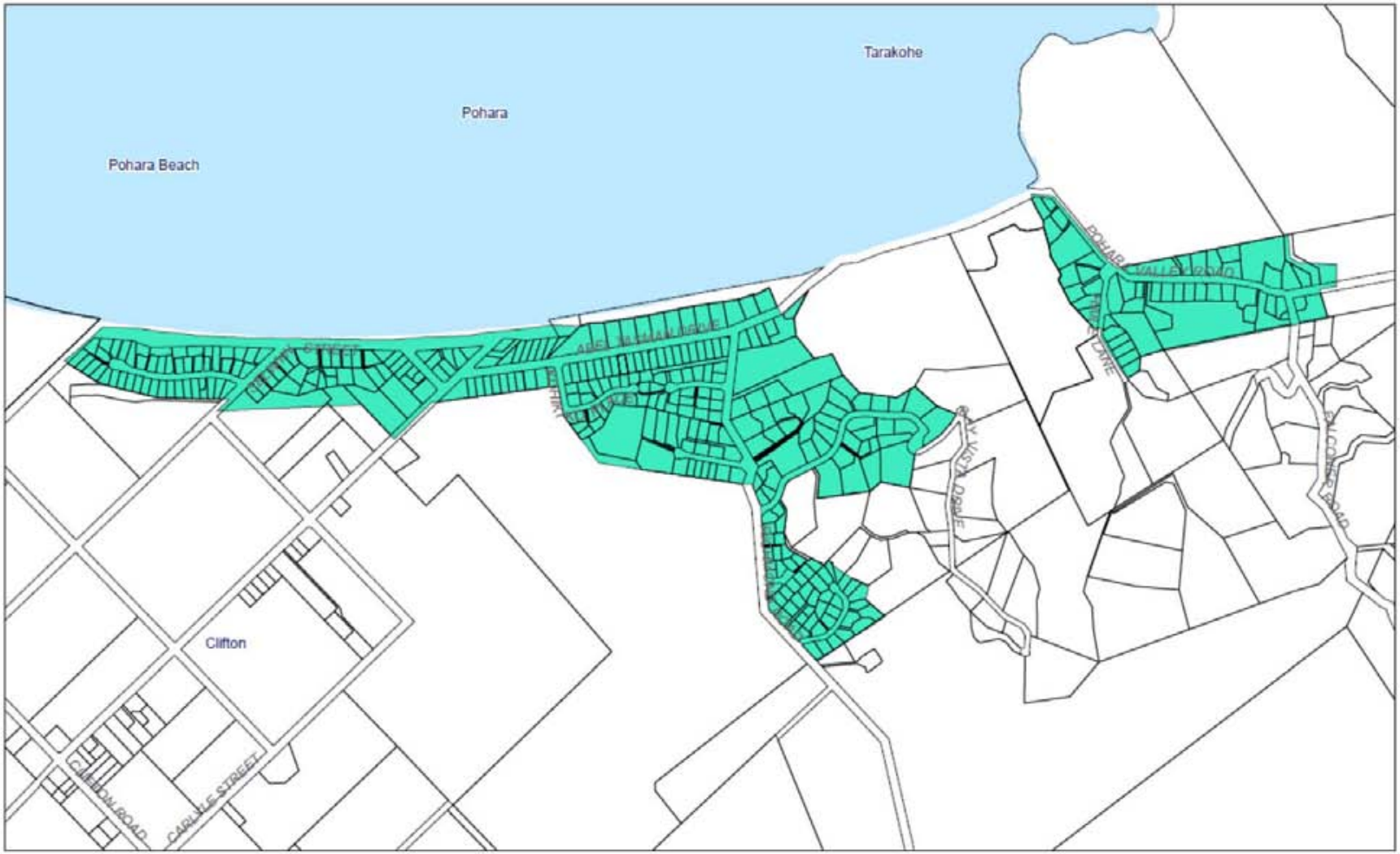
Kaiteriteri
Stormwater Urban Drainage Rating Area

0 250 500 750 1,000 m

N

1:10,500


Aorere River
Gibbstown
Collingwood
BEACH ROAD
COLLINGWOOD-PUPONGA MAIN ROAD
COLLINGWOOD BAINHAM MAIN ROAD
TARAKA COLLINGWOOD HIGHWAY
ORION STREET
Collingwood Stormwater Urban Drainage Rating Area
0
300
600
900
1,200
m
N
1:9,000



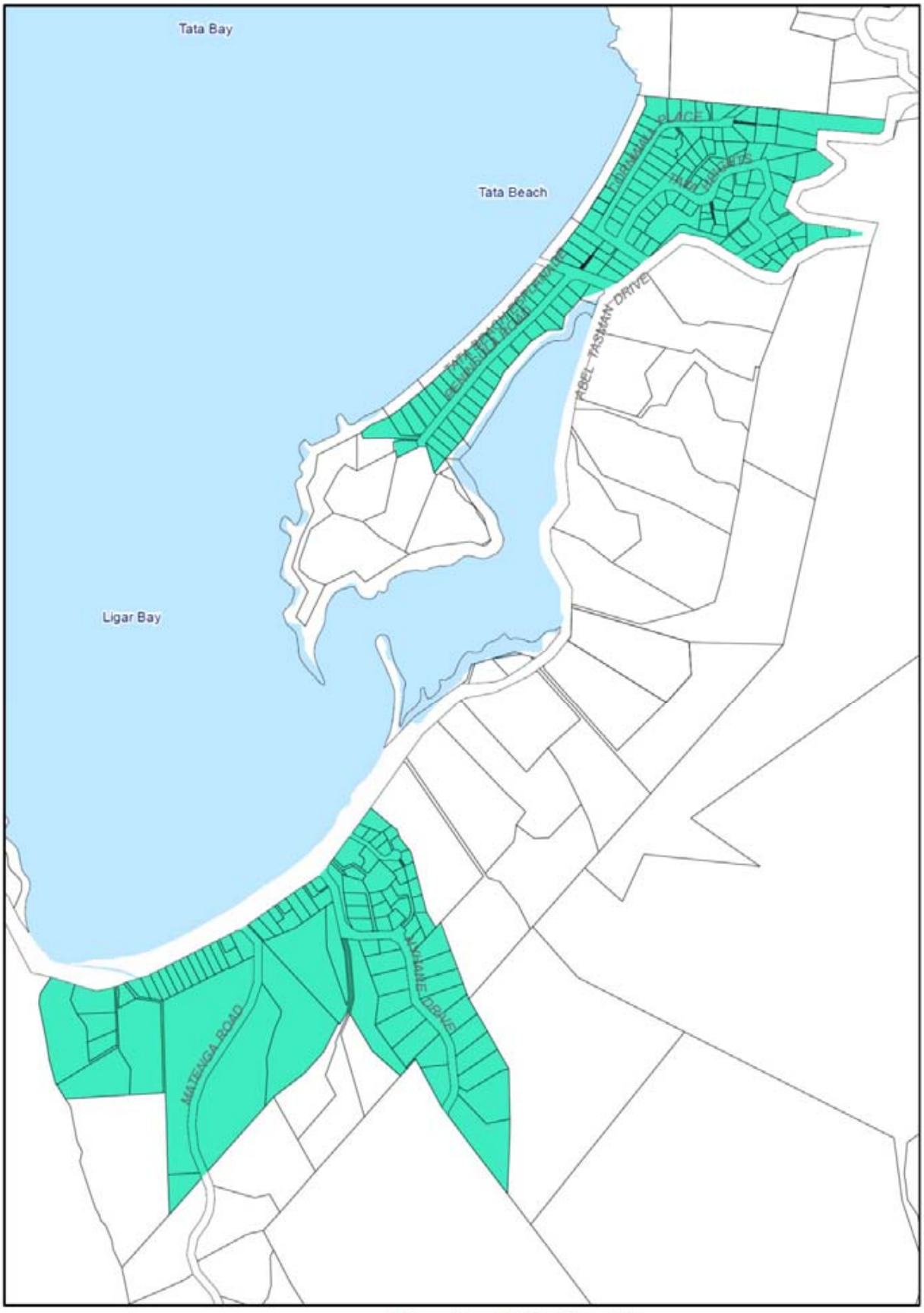
tasman district council

Pohara Stormwater Urban Drainage Rating Area

0 375 750 1,125 1,500 m

N

1:11,500

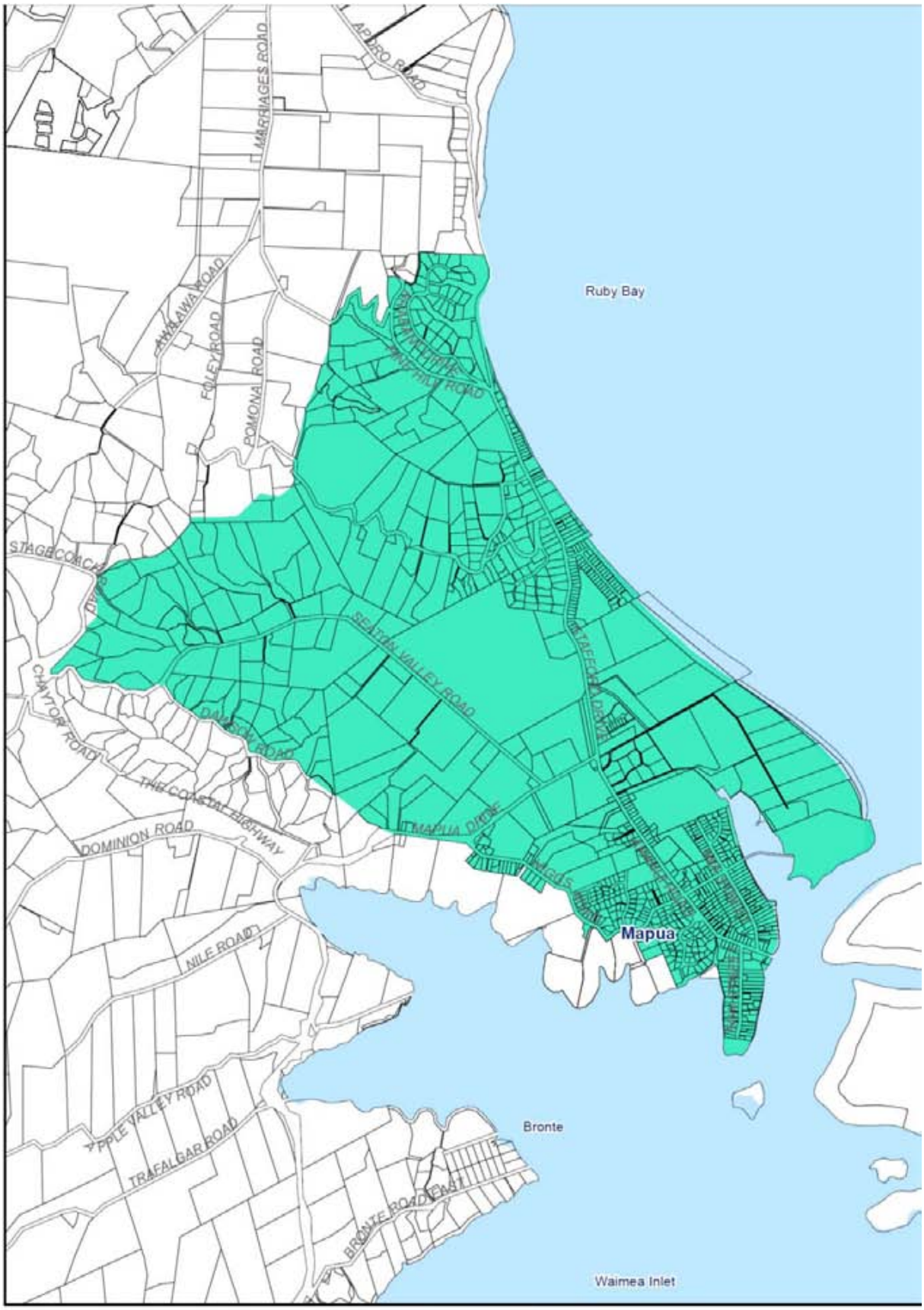


Ligar Bay/Tata Beach
Stormwater Urban Drainage Rating Area

0 220 440 660 880 m

N

1:9,000

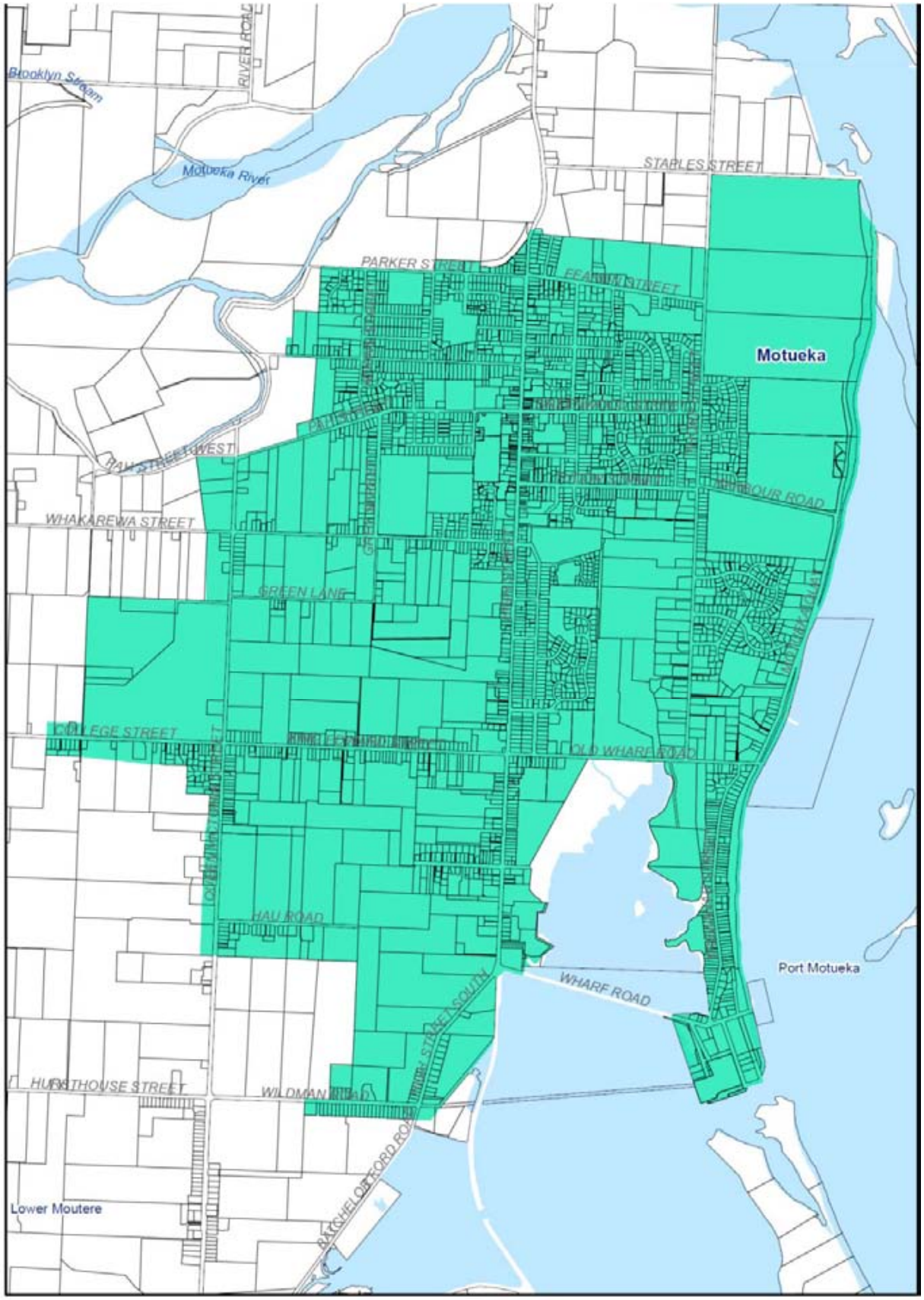


Mapua/Ruby Bay
Stormwater Urban Drainage Rating Area

0 620 1,240 1,860 2,480 m

N

1:26,000

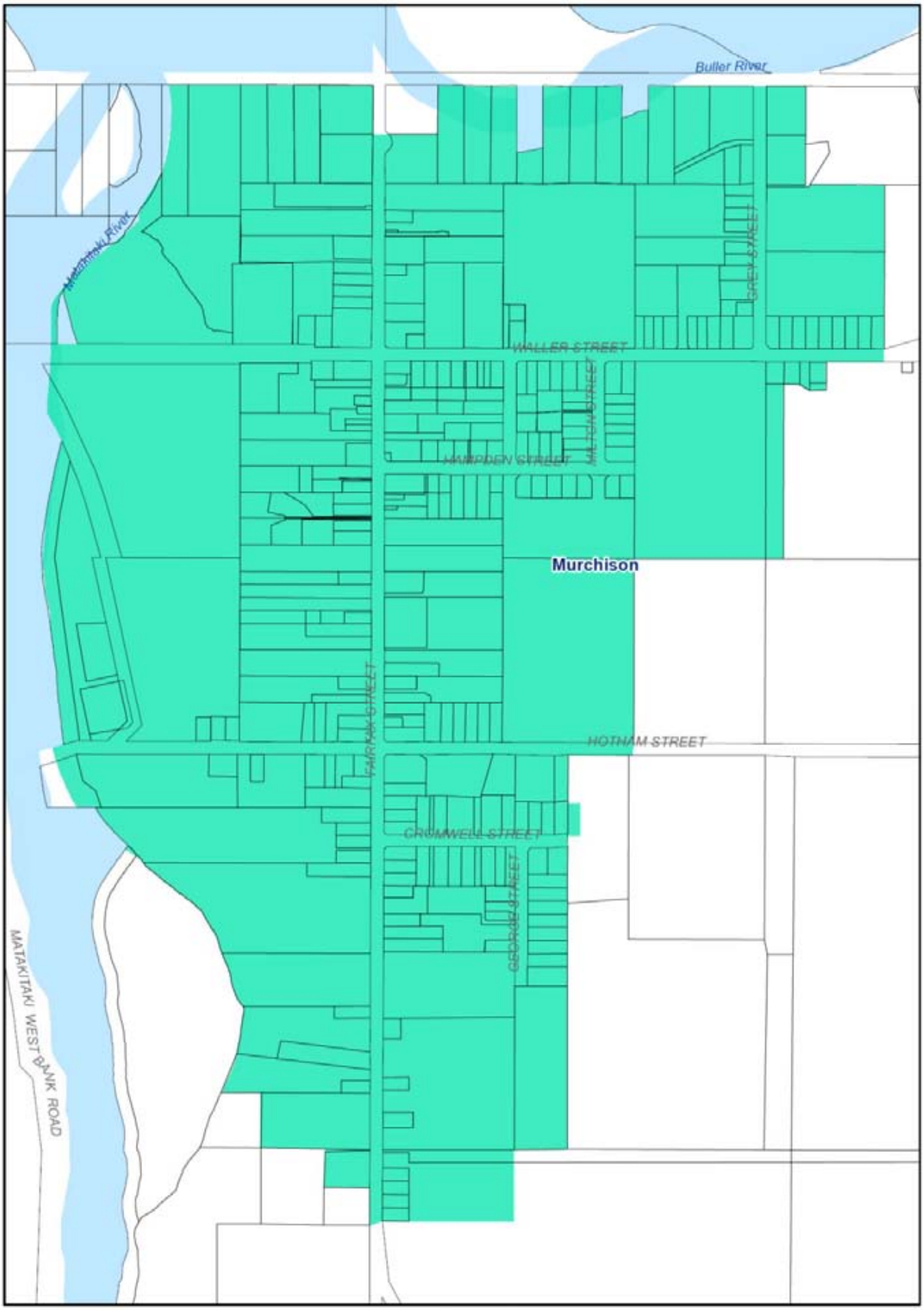


Motueka
Stormwater Urban Drainage Rating Area

0 540 1,080 1,620 2,160 m

N

1:22,500

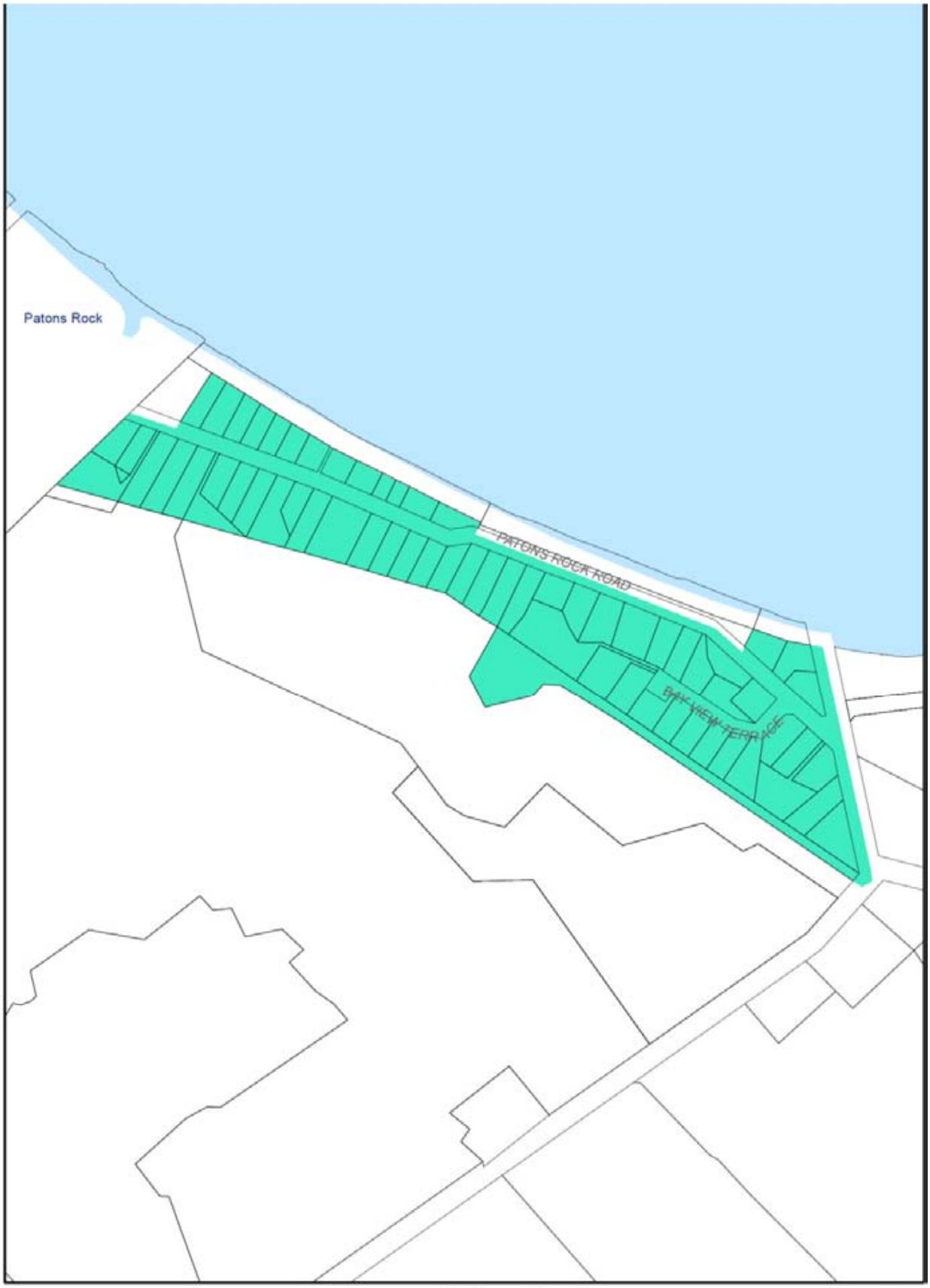


Murchison
Stormwater Urban Drainage Rating Area

0 175 350 525 700 m

N

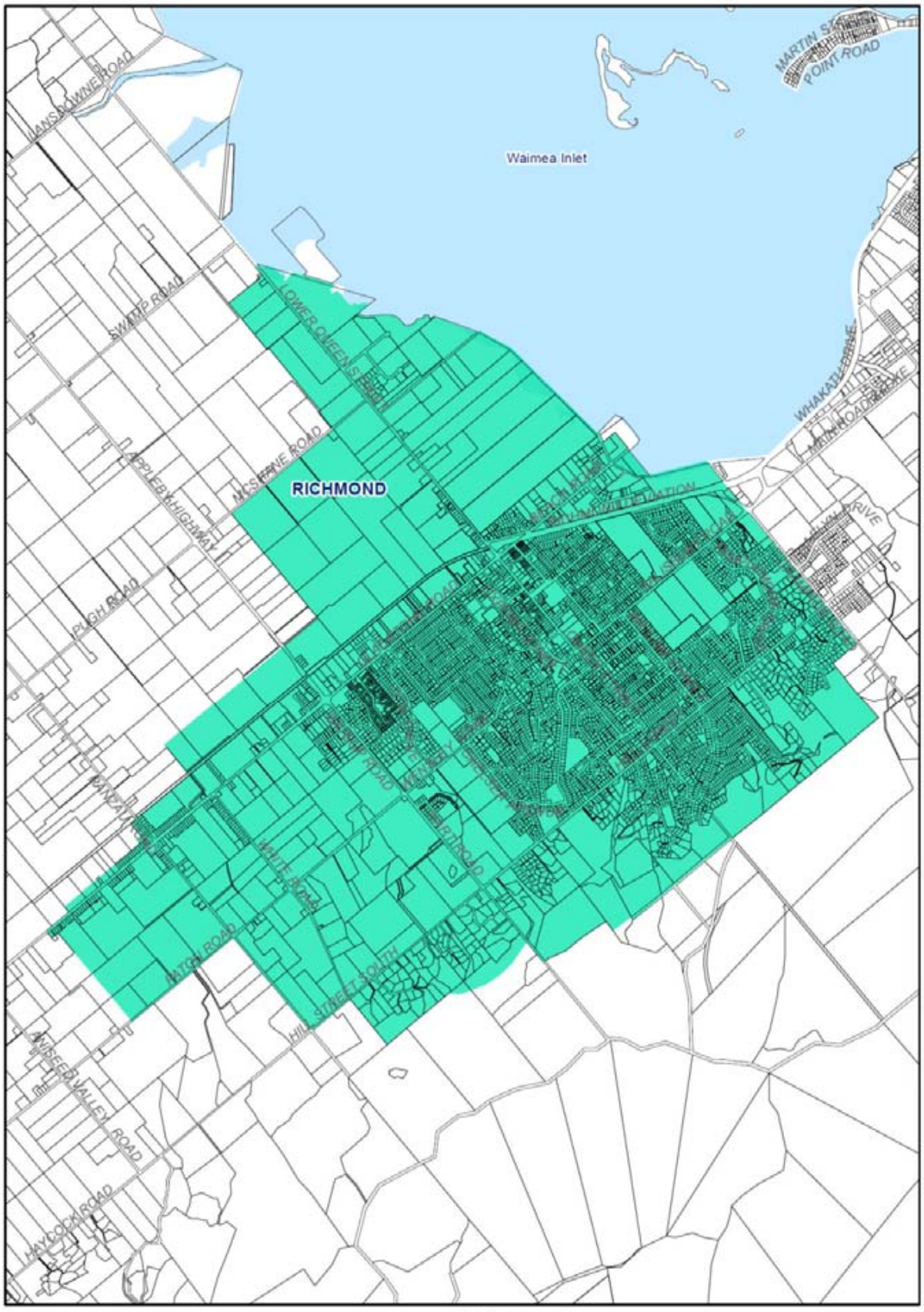
1:7,500



Patons Rock
Stormwater Urban Drainage Rating Area

0 110 220 330 440 m

N
1:4,500

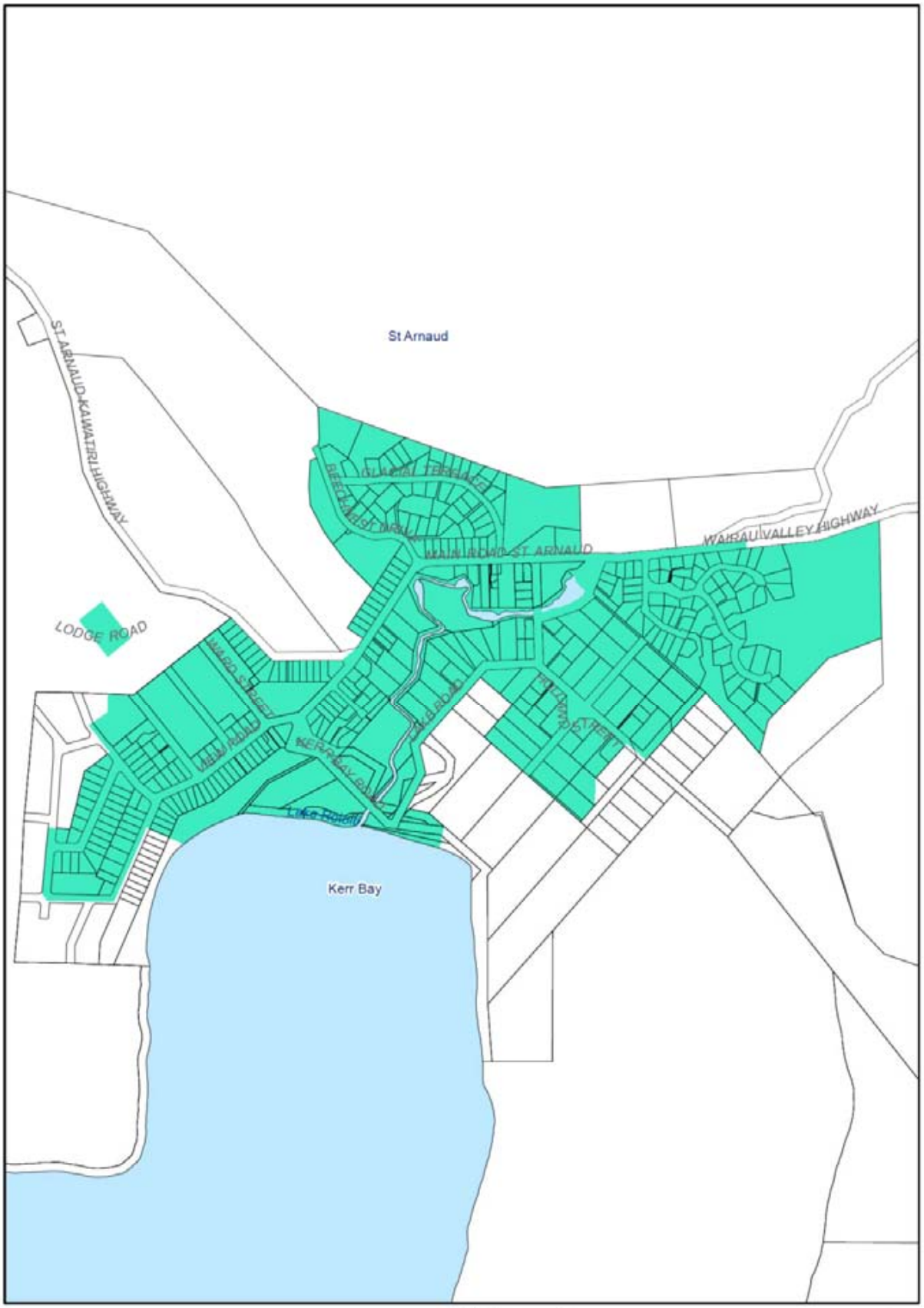


Richmond
Stormwater Urban Drainage Rating Area

0 800 1,600 2,400 3,200 m

N

1:33,500

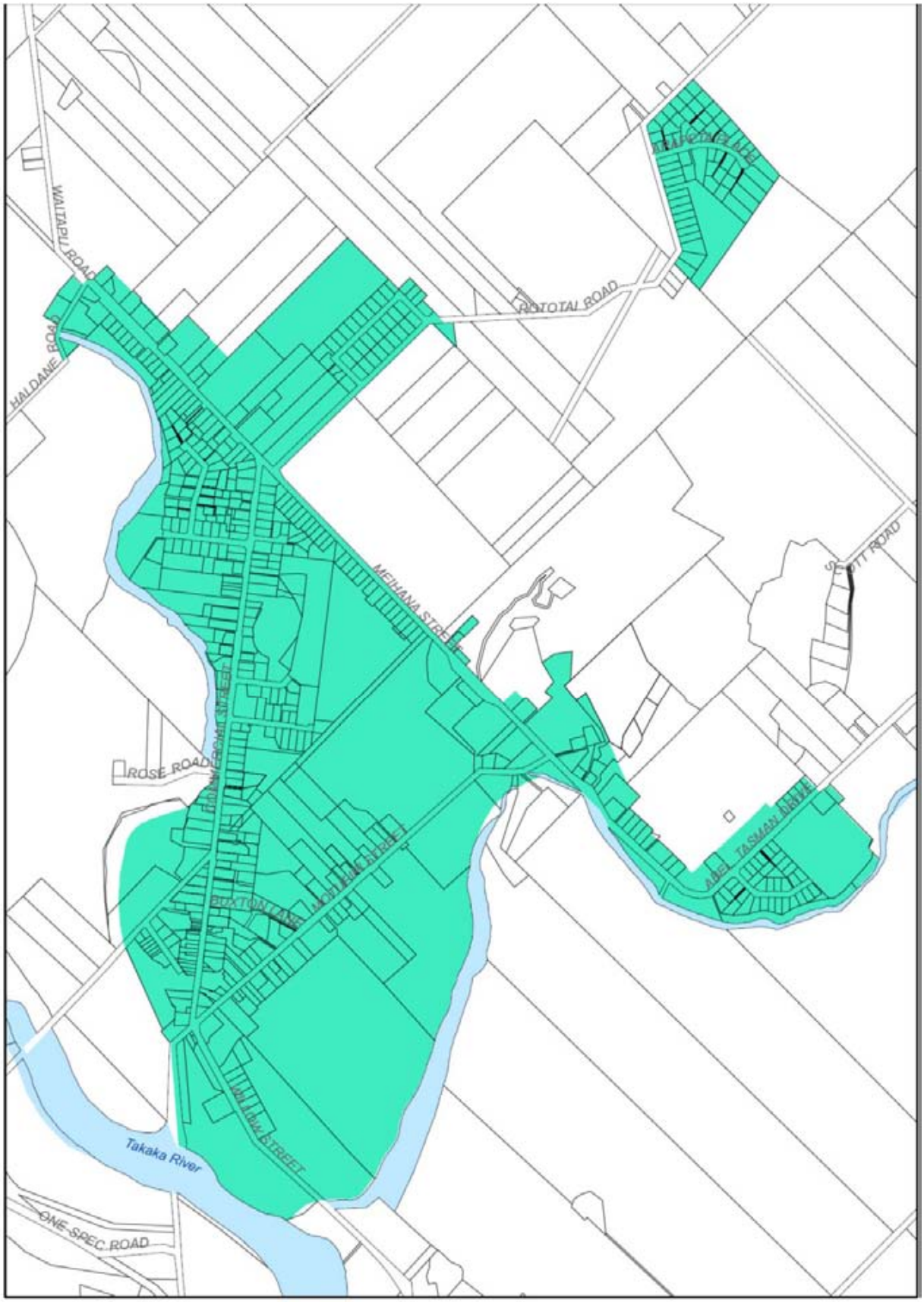


St Arnaud
Stormwater Urban Drainage Rating Area

0 275 550 825 1,100 m

N

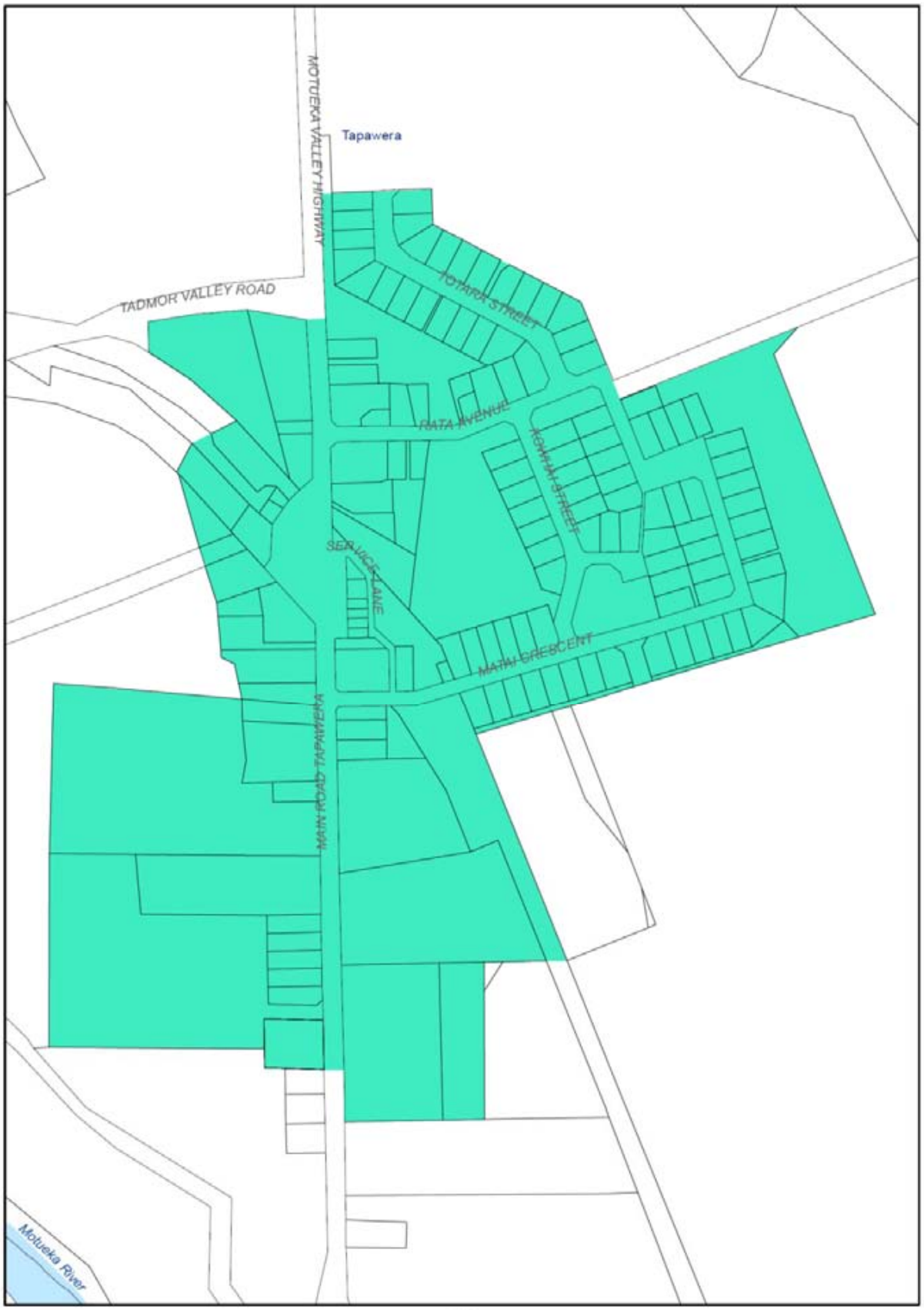
1:11,500



Takaka
Stormwater Urban Drainage Rating Area

0 290 580 870 1,160 m

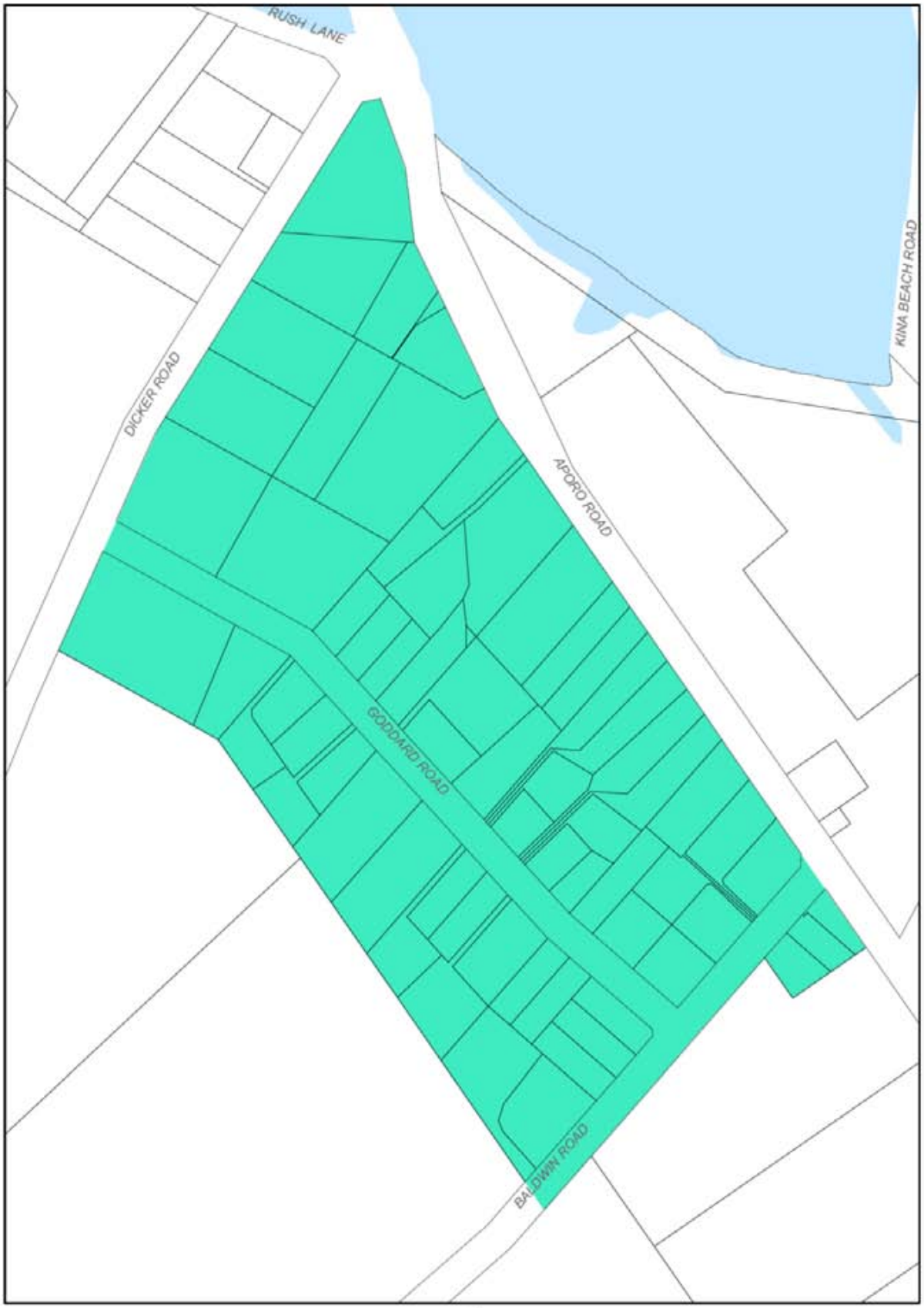
N
1:12,000



Tapawera
Stormwater Urban Drainage Rating Area

0 120 240 360 480 m

N
1:5,000

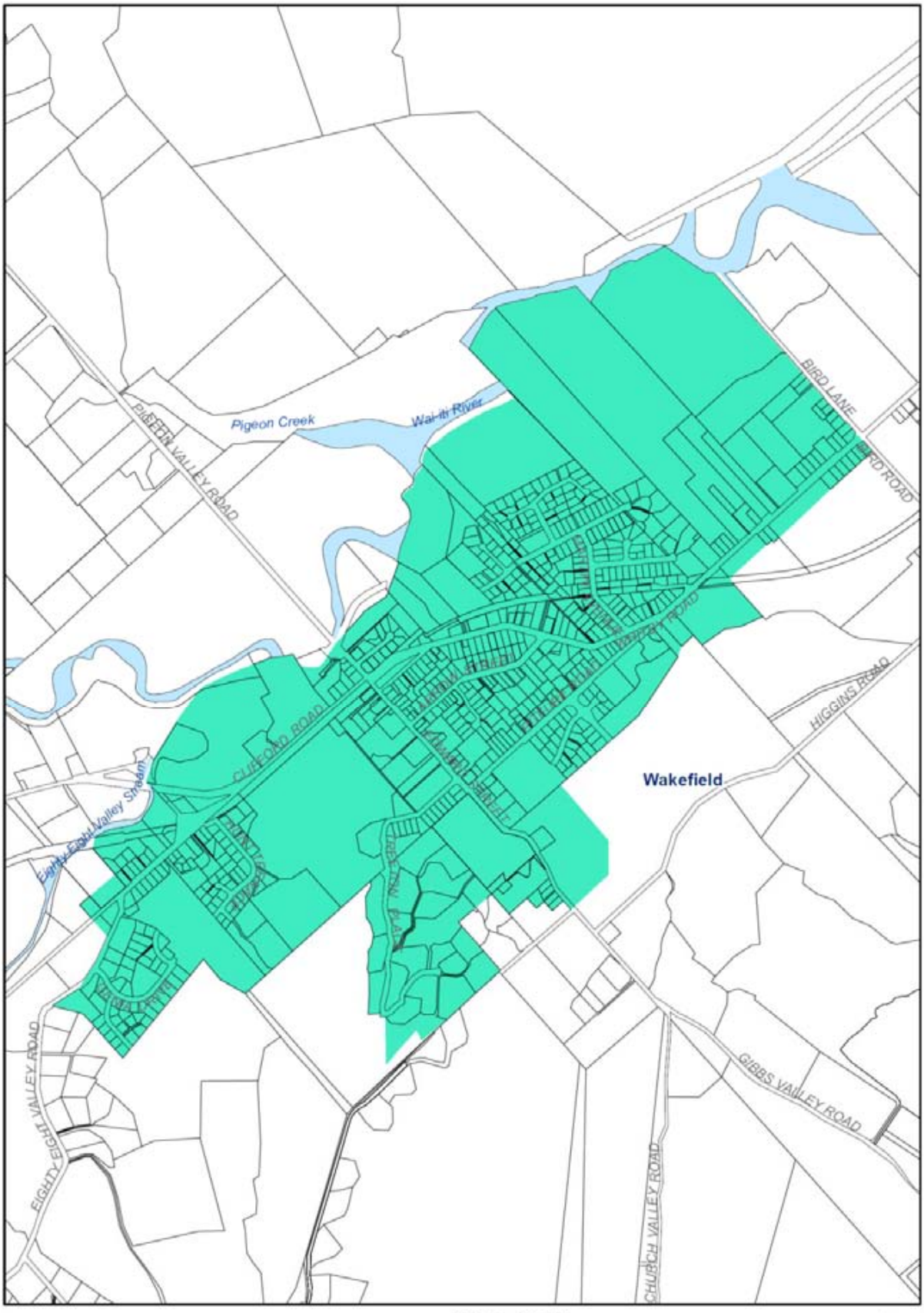


Tasman
Stormwater Urban Drainage Rating Area

0 70 140 210 280 m

N

1:3,000



Wakefield
Stormwater Urban Drainage Rating Area

0 350 700 1,050 1,400 m

N

1:14,500

APPENDIX Z AMP STATUS AND DEVELOPMENT PROCESS – STORMWATER

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:	Katie Henderson
Project Team:	Jeff Cuthbertson, David Stephenson, Sebastian Head, James Tomkinson Paul Barratt, Operations and Maintenance Shane Jellyman, Richard Lester, Andrew Maughan, Denis O'Brien, Dugall Wilson Marty Keetley (Downer)

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.4.1. 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: Scoping of AMP Upgrade Project Review of Levels of Service 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 4	AMP Document Format AMP Readability	Central review of AMP document deliverables.	Becky Marsay
5	AMP Text Accuracy and Currentness	Authors to review each AMP in detail.	Katie Henderson
6	Completeness of Required Upgrades/Expenditure Elements	AMP authors to workshop with relevant project team members to ensure all projects/cost elements covered.	Katie Henderson
		Central list of issues (called a “Parking Lot”) that need to be considered in each AMP.	Katie Henderson
7	Accuracy of Cost Estimates	Independent review of all cost estimates.	Katie Henderson
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/ Denis O'Brien
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.	Katie Henderson
11	Improvement Plan Adequate	Prepare template in advance to ensure consistent approach.	Becky Marsay
		Central review of Improvement Plans.	Becky Marsay

Z.4.2. 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		16 Feb 2012
Levels of Service Asset Manager acceptance	Jeff Cuthbertson	Asset Manager		
AMP document prepared to instructions	Becky Marsay	Project Technical Lead		16 Feb 2012
AMP text accuracy and currentness	Katie Henderson	AMP Author		16 Feb 2012
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	Katie Henderson	AMP Author		16 Feb 2012
Capex Expenditure spreadsheet template reviewed	Becky Marsay	Project Technical Lead		16 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	Katie Henderson	AMP Author		16 Feb 2012
Opex Costs spreadsheet arithmetic review	Katie Henderson	AMP Author		16 Feb 2012
Opex Cost forecast – fitness for purpose	Jeff Cuthbertson	Asset Manager		
Improvement Plan prepared to instructions	Becky Marsay	Project Technical Lead		16 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	Katie Henderson	AMP Author		16 Feb 2012
Change log complete and changes appropriately dealt with – after Public consultation	Jeff Cuthbertson	Asset Manager		
Peer Review completed	Peter Thomson	Engineering Manager		