Draft

2018-2028

Stormwater Services Activity Management Plan

Drainage and Water Unit
Infrastructure Group

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EXECUTIVE SUMMARY

The Timaru District Stormwater Activity Management Plan (AMP) 2018-28 is a Plan for how Timaru District Council (TDC) will deliver stormwater services in the next 10 years. The AMP is organized in two parts: Part A provides the overview of the Stormwater Activity and describes the general practices, challenges and planned approaches that apply to the District's stormwater schemes in the urban townships of Geraldine, Pleasant Point, Temuka and Timaru. Part B provides the specific details on the assets, issues and planned works on each of the schemes.

Part A – Overview and General Activity Management

TDC's Drainage and Water Unit is primarily responsible in managing the Stormwater Activity. In-house personnel perform technical and administrative functions. External service providers are contracted out by TDC to undertake asset maintenance services.

Council's plan for the next 10 years aims to continue to provide Levels of Service that meet customers' core values of Quality, Safety, Efficiency, Responsiveness and Affordability of stormwater services. To achieve these, Council will focus on addressing the key challenges relating to the quality of the District's urban stormwater discharges and the capacity of its assets to meet agreed levels of service.

The capital expenditure programme in the next 10 years will address the issues through improvements in the capacity, performance and condition of existing assets, as well as developing new assets to meet attenuation and treatment standards. Major works identified involve reticulation renewals and upgrades, and installation of attenuation and treatment systems (e.g., ponds, filter media, riparian plantings)

Council will also continue to carry out improvements in its management of the Stormwater Activity. Priority areas are asset data build-up and quality management, developing a demand management strategy, and implementing a more effective information, education and communication programme on everyone's responsibilities in stormwater management.

Part B

Part B of the Stormwater AMP focuses on asset management. It provides a detailed description of the assets that comprise the schemes in Geraldine, Timaru, Temuka and Pleasant Point.

This Part of the AMP also describes the condition and performance of the stormwater assets, and identifies major concerns in particular schemes.

A summary of operational issues is provided which outlines the areas where the focus of the AMP will be in the next 10 years.

From the identified issues, a 10-year capital expenditure plan was developed covering identified renewals, upgrades and other capital works.

PART A – OVERVIEW AND GENERAL ACTIVITY MANAGEMENT

A1 INTRODUCTION

A1.1 ABOUT THIS PLAN

The Timaru District Stormwater Activity Management Plan (AMP) 2018-2028 brings together in one place the Council's strategic approach to the delivery of the Stormwater Activity (the 'Activity') which then forms part of Council's Long Term Plan.

In line with Council's Activity Management Planning Policy, preparation of the 2018-2028 Stormwater AMP commenced with an assessment against the *International Infrastructure Management Manual (IIMM)'s Asset Management Maturity Index*[1] to determine the current and aspirational level of maturity for this activity.

The diagram below shows the results of the assessment in 16 areas of management of the Activity. Overall, current score is 49 which is a Core level and the assessed aspirational score is 77 which is an Intermediate maturity level.

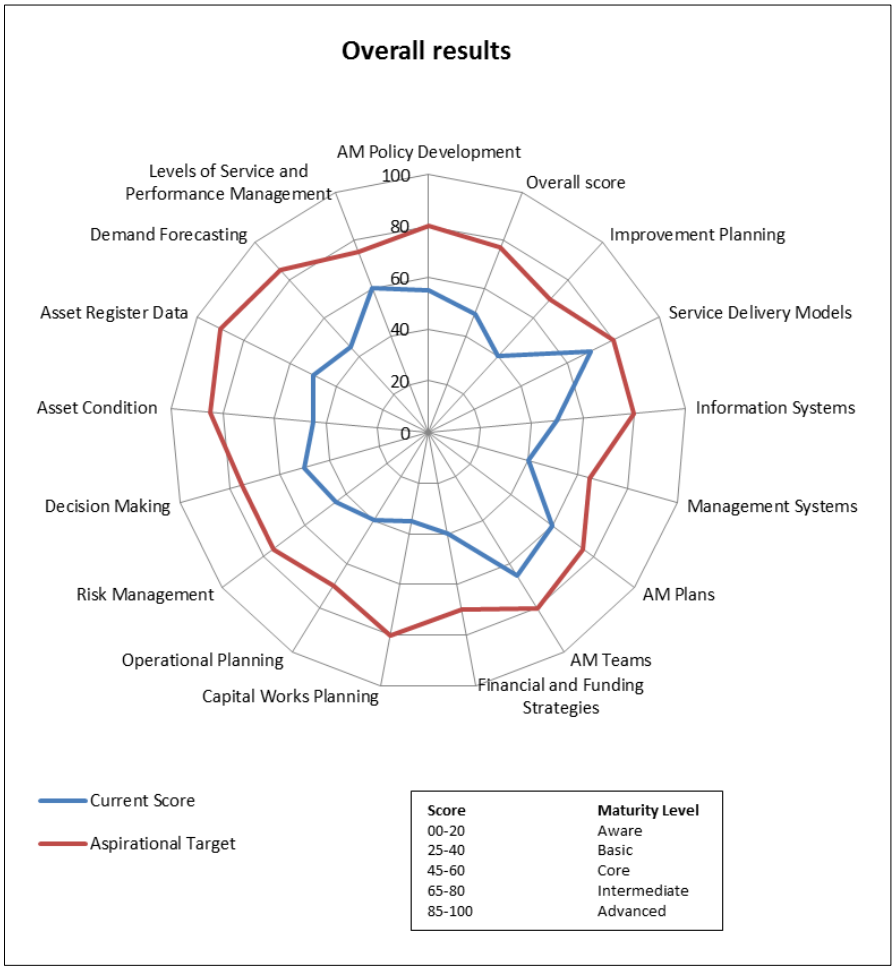

Figure 1: Stormwater Activity Management Maturity Assessment Results

[1] The Asset Management Maturity Index is adopted from the International Infrastructure Management Manual 2015 edition, produced by the Institute of Public Works and Engineering Australasia (IPWEA)

This AMP reflects current practices in carrying out the various aspects and components of the Activity and includes an Improvement Plan to progressively achieve the aspirational activity management level.

AMP structure and content

The AMP structure and content is based on the framework prescribed in the IIMM which gives emphasis on risk and demand management as key drivers of asset/activity planning (see Figure 2).

Part A provides the overview of the Activity in relation to TDC's vision and strategic direction, and the Activity's contribution to the community outcomes defined in Council's Long Term Plan. Part A sets out the general information that applies to the Activity as a whole. These include the Activity level of service, key challenges, and the strategies, approaches and practices in managing demand, risk and the life cycle of the assets. Information management, financial planning considerations and an Improvement Plan are also contained in Part A.

Part B contains the detailed plan for each of the four public stormwater schemes owned and managed by Council in the townships of Geraldine, Pleasant Point, Temuka and Timaru. It covers specific information on the assets held for each scheme, the condition and performance of these assets, demand drivers and forecasts, management of identified risks, key projects for the next 10 years and the associated budget requirement.

This AMP, as well as previous AMPs, serves as a repository of information that will assist staff to gain knowledge of the history of the Activity including awareness of how business practices have evolved, and gain insight into the improvements that have been carried out. The documentation in the AMP mitigates the risk associated with staff leaving the organisation, as it assists in institutional knowledge being passed on, for continuity of organisational culture.

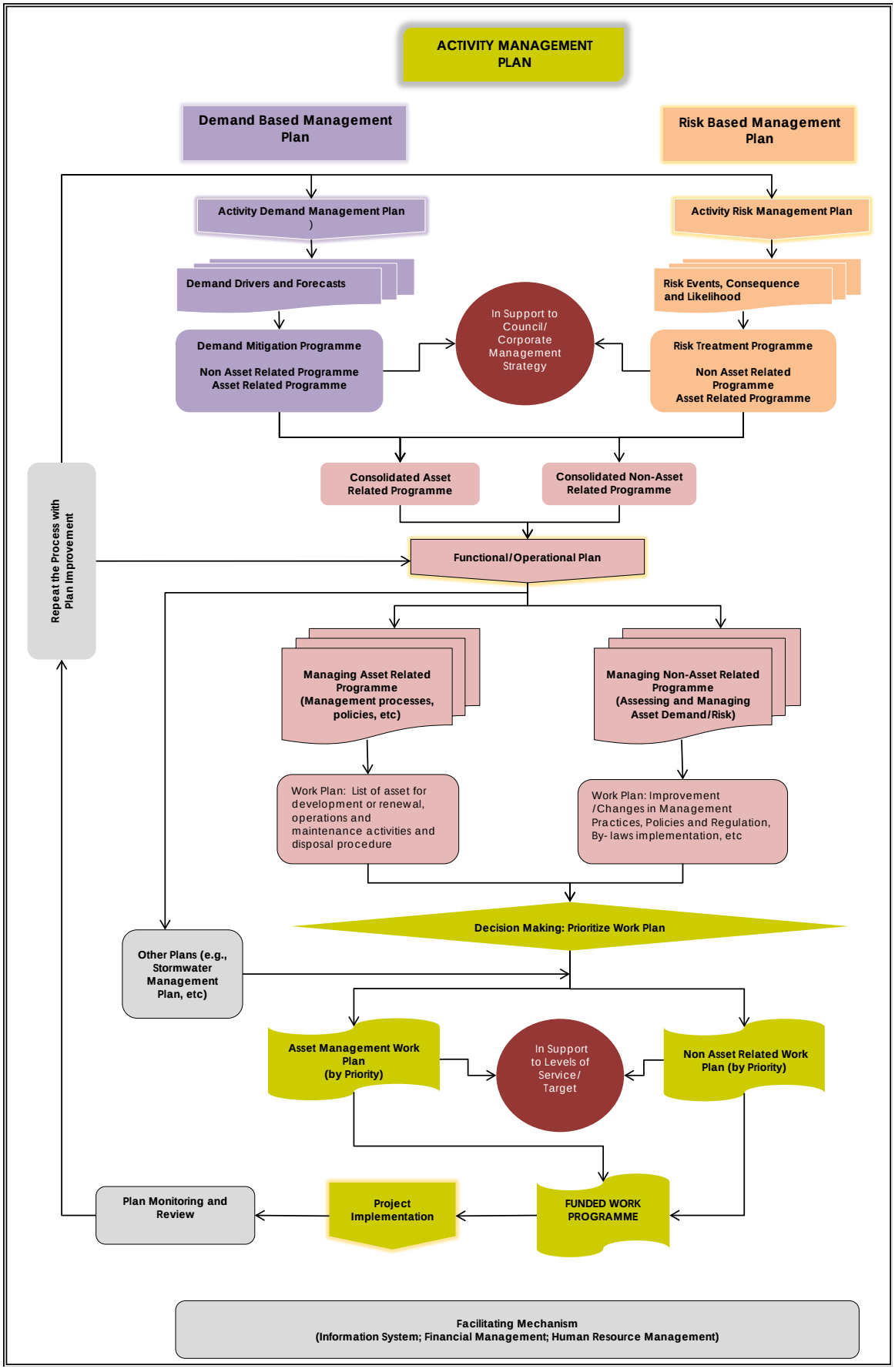

Figure 2: Stormwater Activity Management Planning Framework

A1.2 OBJECTIVE OF THE PLAN

The objective of this AMP is to address how Levels of Service will be met, as well as how present and future needs will be cost-effectively managed. This will be achieved through a systematic approach in managing the assets and in responding to the changing needs and expectations of the Timaru District community, ensuring that legislation and policies are being complied with, and that there is effective and efficient targeting of priority works.

A1.3 RELATIONSHIP WITH OTHER PLANS, POLICIES AND STRATEGIES

Internal Plans and Strategies

The Long Term Plan (LTP) process illustrated in Figure 3 below provides an overview of the planning for the stormwater activity. Council's Strategic Framework sets out the Vision, Outcomes and Priorities to be pursued for the District in the next 10 years. The LTP provides the general planning parameters in terms of the key issues for Council over the next 10 years, projected growth and development of the District, infrastructure strategy and financial strategy.

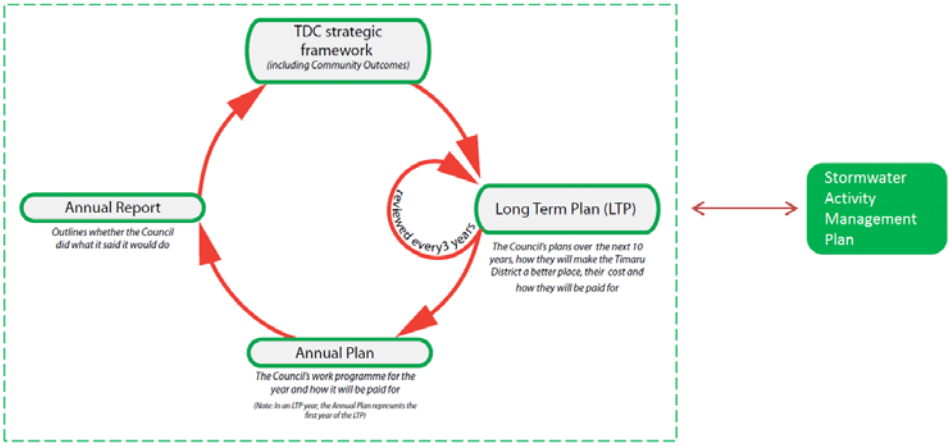

Figure 3: TDC Long Term Planning Cycle

The Stormwater AMP informs the LTP in how Council will provide public stormwater services. It has the same 10-year coverage period as the LTP. Works to be carried out in the first 3 years are identified in detail. The remaining 7 years are provided in outline with indicative levels of funding requirements.

The Annual Plan translates the LTP (and AMP) into a yearly programme of action. It contains a confirmed list of works that address specific issues on asset condition and performance, demand and risk. Performance against the Annual Plan is reported yearly in Council's Annual Report, highlighting the Activity's contribution to the Community Outcomes set out in the LTP.

The Growth Management Strategy and the District Plan Review documents prepared by Council's Planning Unit were considered in this AMP in terms of information which, for example, may influence changes in demand for stormwater services arising from development. The District Plan also provides guidance on financial contributions relating to the provision of public stormwater infrastructure.

Timaru District Stormwater Strategy 2018-2048

TDC has recently adopted a Stormwater Strategy (Document #1078874) that is intended to provide the overarching framework for stormwater management in the District. Figure 4 below summarizes the relationship between various planning and policy instruments for stormwater management, including the Stormwater AMP which gives effect to the purpose of the Local Government Act.

In developing this current Stormwater AMP, careful consideration was made to ensure that it is consistent with the goals, objectives, directives and methods of the Stormwater Strategy.

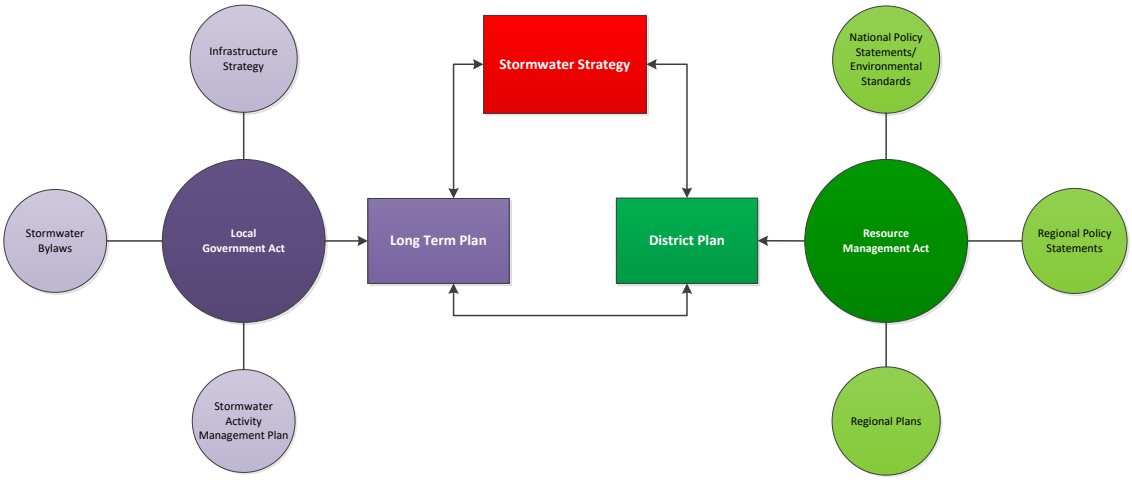

Figure 4: Stormwater Planning and Policy Framework

Stormwater Management Plans

TDC is currently in the process of developing Stormwater Management Plans (SMPs) for major catchments in the district. SMPs are specifically prepared for the purpose of obtaining consent to discharge stormwater to the receiving environment, as required under the Canterbury Land and Water Regional Plan. The SMPs are aimed at meeting specific stormwater quantity and quality standards for particular catchments. SMPs are resourced through the Stormwater AMP's budget. The AMP is Council's more comprehensive plan for dealing with catchment specific as well as the wider issues of meeting levels of service and ensuring effective and efficient management of the District's stormwater infrastructure.

External Plans, Policies and Strategies

TDC recognises the role of other bodies involved in stormwater planning, management and regulation. This AMP is guided by the policies, requirements and strategies in the following plans that emerged from the Resource Management Act 1991, and that impact on the operation and management of Timaru District's stormwater services:

1. Canterbury Land and Water Regional Plan (LWRP)

The LWRP establishes rules for land and water management throughout Canterbury.

Sections 4.15 – 4.17 set out the requirements for stormwater and community wastewater in urban areas.

2. Regional Coastal Environment Plan for the Canterbury Region

This Plan, prepared under the RMA and approved in November 2005, aims to promote the sustainable management of the natural and physical resources of the Coastal Marine Area and the coastal environment and to promote the integrated management of that environment, in particular addressing issues relating to:

- protection and enhancement of the coast;
- water quality;
- controls on activities and structures; and
- coastal hazards

The Plan sets out objectives, policies, and methods including rules to resolve these issues and to improve the coastal environment now so that future generations can continue to enjoy it.

3. Canterbury Water Management Strategy (CWMS)

The Canterbury Water Management Strategy commenced in 2010. It provides for a collaborative management of Canterbury's water resources to better balance environmental and economic goals. It is implemented through CWMS zone committees who work collaboratively to develop effective water management solutions that deliver economic, social, cultural and environmental outcomes in consultation with the local community. TDC is a member of the Orari-Opihi-Pareora Zone Committee.

4. Opihi River Regional Plan (2000) (ORRP)

This Plan provides outline in terms of water allocation and discharge of water to water bodies within the Opihi Catchment. This will be amended and incorporated within the review of the OOP Zone in 2017/18.

The Plan cited stormwater discharges from communities as offensive to Takata Whenua. Discharges with insufficient treatment will lower water quality that may also affect drinking water and other recreational uses. The resource consents to be obtained for Timaru's stormwater discharges will address these concerns.

5. National Policy Statement for Freshwater Management 2014 (NPS-FM)

The NPS took effect on 1 August 2014, superseding NPS-FM 2011. It directs regional councils to consider specific matters about fresh water when they are developing regional plans for fresh water. Decision-makers under the RMA must have regard to the NPS in consenting decisions. The Freshwater NPS is intended to drive national consistency in local RMA planning and decision-making while allowing for an appropriate level of regional flexibility. The NPS sets in place a strengthened limits-based regime for water management.

Policy A and Policy B are relevant to stormwater management. Policy A requires local authorities to effect measures to help improve or protect water quality in rivers, wetlands and other water bodies. Policy B relates to water quantity in order to safeguard the life-support capacity of the ecosystem in fresh water by sustainably managing abstraction, use, damming and diverting of the resource.

A proposal for amendment of the NPS-FM is one component of central government's clean water reforms launched in 2017. The suite of reforms also includes a target that 90 per cent of the country's rivers and lakes are swimmable by 2040, greater information on water quality for swimming, and details of proposals to exclude stock from waterways. It also launched the $100 million Freshwater Improvement Fund.

The proposed NPS-FM amendments cover the following areas:

- swimming and recreational values
- monitoring macroinvertebrates
- maintain or improve overall water quality
- managing nitrogen and phosphorus
- economic well-being
- the effect of national bottom lines on infrastructure
- coastal lakes and lagoons
- Te Mana o Te Wai.

6. New Zealand Coastal Policy Statement 2010 (NZCPS)

The Resource Management Act 1991 established a coastal management regime based on a partnership between the Crown and the community through their regional and local authorities. The Act requires a NZCPS to guide local authorities in their day to day management of the coastal environment. Local authorities must give effect to relevant provisions of the NZCPS in planning documents and resource consent authorities must have regard to relevant provisions when considering consent applications.

Specifically, *Policy 23 – Discharge of Contaminants* applies to TDC's stormwater activity. Compliance with the policy is achieved through resource consents compliance.

7. Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement sets the framework for resource management in Canterbury. It provides an overview of the significant resource management issues facing the region, and sets out objectives, policies and methods to address the region's resource

management issues. Its goal is the integrated management of the region's natural and physical resources. The following are relevant to stormwater management:

Policy 9: To manage point and non-point source discharge and set water quality conditions and standards and terms in plans, and conditions in resource consents;

Policy 11: Promote land use practices which maintain and where appropriate enhance water quality;

Policy 14: Where resource consent is for an activity which involves mixing of water from different water bodies, information on the effects of the activity on the environment should include effects of the mixing on the cultural values of Tangata Whenua.

A1.4 RELATIONSHIP WITH LEGISLATION

1. The Local Government Act 2002 (LGA)

This Act defines the purpose of local government as including meeting current and future needs of communities for good quality local infrastructure that is most cost effective for households and businesses, where good quality infrastructure means efficient, effective and appropriate to present and anticipated future circumstances. Part 6 of the Act prescribes the processes and content of the Long Term Plan, Annual Plan, Annual Report and Infrastructure Strategy. Part 7 sets out specific obligations and restrictions in relation to the delivery of water services. Schedule 10 of the Act outlines the requirements for Council's long term plans. AMPs provide key inputs to long term plans for infrastructure activities managed by local authorities such as stormwater services.

2. The Resource Management Act 1991 (RMA)

This Legislation promotes the sustainable management of natural and physical resources. It describes the functions of Regional Councils and Territorial Authorities under this Act, including the establishment, implementation and review of objectives, policies and methods to achieve integrated management of the resources. The RMA requires local authorities to recognise national environmental standards, national policy statements and regional plans, and prepare, implement and administer district plans. Compliance with the RMA is achieved through resource consents compliance.

3. Resource Management Regulations

a) Resource Management (National Environmental Standard for Sources of Human Drinking Water) Regulations 2007

Regulations 6 to 8 restrict potentially polluting discharges near abstraction points for domestic water systems. Regional councils are directed against granting Discharge Permits near abstraction points if the potential to degrade water supplies is high.

b) Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

This provides a nationally consistent set of planning controls and soil contaminant values and ensures that land affected by contaminants in soil is appropriately identified and assessed before it is developed, and if necessary the land is remediated or the contaminants contained to make the land safe for human use.

All territorial authorities (district and city councils) are required to give effect to and enforce the requirements of the National Environmental Standards (NES). The NES does not affect existing land uses.

4. The Health Act 1956

This Act places obligation on Council to improve, promote and protect public health within the District. The provision of stormwater services conserves public health and helps to protect land and waterways from contamination.

5. The RMA (Energy and Climate Change) Amendment Act 2004

This Act amended the RMA (1991). It requires Local Authorities to plan for the effects of climate change.

6. The Building Act 2004

This Act provides a regulatory framework for building work, establishes a licensing regime and sets performance standards to ensure buildings have attributes that contribute to the health, safety, physical independence and wellbeing of people. The Act requires that private stormwater systems are constructed/installed in accordance with the NZ Building Code.

7. Timaru District Consolidated Bylaw 2013

Section 146 of the Local Government Act 2002 provides that a Territorial Authority may make Bylaws in its district for purposes of regulating, managing, protecting or for preventing the use of the land, structures, or infrastructure associated with stormwater services. Chapter 15 of the Timaru District Consolidated Bylaw 2013 contains specific provisions that apply to stormwater.

8. Mandatory Non-Financial Performance Measures Rules 2013

The Local Government Minister has required local authorities to incorporate mandatory performance measures for stormwater services in the development of their 2015-2025 long-term plans. These measures will be reported against levels of service in the 2015/2016 annual reports.

9. Civil Defence Emergency Management Act 2002

This Act requires a local authority to ensure it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency; and to plan and provide for civil defence emergency management within their own district. These duties are in addition to the requirement to be part of, and carry out the functions and obligations of a member of, a CDEM Group.

10. Health and Safety at Work Act 2015

The main purpose of the Act is to provide for a balanced framework to secure the health and safety of workers and workplaces.

It provides that regard must be had to the principle that workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare from hazards and risks arising from work or from specified types of plant as is reasonably practicable.

A1.5 Key Relationships

Within the TDC organisation, the Drainage and Water Unit (D&W), as part of the Infrastructure Group, and as the primary implementer of this Activity, reports to and liaises with the Infrastructure Committee of the Council on stormwater governance and policy concerns requiring resolution or approval at the Council Committee level. The Infrastructure Committee is composed of elected members of the Council.

D&W also collaborates with other units within TDC with various roles relevant to the effective delivery of stormwater services. These include the corporate planning and finance units, the land transport and waste minimisation units, district planning and building units, IT unit and customer services.

In 2016, TDC set up a Stormwater Management Group comprised of the Drainage and Water Unit, Land Transport Unit, Planning Unit and Parks and Recreation Unit, with the Group manager of the Infrastructure Group providing executive oversight. D&W chairs the group. The purpose of the SMG is to provide a venue for internal coordination by units of the Council that have planning, regulation and management responsibilities in relation to stormwater. The AMP is informed by the discussions in the SMG particularly with respect to improvements in stormwater asset management.

Externally, TDC maintains relationships with the community boards of Geraldine, Pleasant Point and Temuka. The boards provide a venue for discussing community issues including stormwater concerns.

TDC also maintains relationships with the Regional Council for coordination and guidance in complying with resource consents and other relevant requirements of regional policies/plans, and with Fish and Game New Zealand for consideration of concerns pertaining to the preservation of fish and game habitats, particularly the rivers.

TDC consults with relevant catchment and Iwi (Arowhenua) groups as necessary during planning and implementation of stormwater projects.

TDC has regular liaison with contractors to ensure effective and efficient delivery of contracted services for major stormwater projects and maintenance.

Stakeholders

Individuals and/or groups that have direct or indirect use of TDC's stormwater services are considered as stakeholders in the Activity, due to the interests they represent as consumers, regulators or as advocates for the environment and other socio-cultural matters. They include the following and their interests are considered in this AMP:

Table 1: Stormwater Activity Stakeholders

Key Stakeholders	Main Interests
Timaru District Council	Service provider
External	
Residents and ratepayers	Public health and safety, service reliability, environment, cost
Local industries/businesses, e.g. • Heavy Industry • Light Industry • Commercial • Retail	Public health and safety, service reliability, environment, cost
Community facilities • Schools • Hospitals • Parks, Gardens and Walkways • Libraries, Museum, Art Gallery	Public health and safety, service reliability, environment, cost
Regional Council (ECan)	Environment
Government agencies • Ministry of Health • Ministry for the Environment • Department of Conservation • NZ Transport Authority • Office of the Auditor General • Audit New Zealand	Public health and safety, service reliability, environment, cost
Te Runanga O Arowhenua	Environment, culture, heritage
Central South Island Fish and Game	Public health and safety, service reliability, environment, cost
Community Groups such as • Royal Forest and Bird Society • Federated Farmers • NZ Council of Women	Public health and safety, service reliability, environment, cost
Suppliers	Procurement, technical support
Consultants	Procurement, technical support
Internal	
Councillors and Sub-committees	Public health and safety, service reliability, environment, cost
Community Boards	Public health and safety, service reliability, environment, cost

Key Stakeholders	Main Interests
Executive	Public health and safety, service reliability, environment, cost
Environmental Services	Public health and safety, environment
Infrastructure Group	Public health and safety, service reliability, environment, cost
Community Services	Public health and safety, service reliability, environment, cost
Corporate Services	Public health and safety, service reliability, environment

A2 Strategic Direction

This AMP is guided by the strategic direction set out in the Timaru District's Long Term Plan 2018-2028.

A2.1 Vision, Outcomes and Priorities for Timaru District

TDC has a four-pronged Vision for the District outlined as follows:

> *Lifestyle* - fantastic sustainable lifestyle second to none. We live in a pretty special place. We want to keep it that way. We want to make it even better for ourselves, our children, their children.
>
> *Economy* - thriving and innovative economy where opportunities abound. Our economy is essential to our future. We need it to grow innovatively and sustainably.
>
> *Identity* - strong and enviable reputation and identity. We want to forge and strengthen a reputation and identity that other districts may aspire to.
>
> *Leadership* - inspiring, people-focused leadership. We want a district where we build on our strengths, minimise our weaknesses, challenge our threats and grasp our opportunities. This takes leadership.

There are six Community Outcomes that Council aims to achieve:

1. High quality infrastructure to meet community and business needs
2. Smart economic success supported and enabled
3. Communities that are safe, vibrant and growing
4. People enjoying a high quality of life
5. A strong identity forged and promoted
6. A valued, healthy and accessible environment

Council has identified four priority areas that are essential to enable it to work towards the Vision and Community Outcomes:

1 Investing in Community
2 Promote integrated, highly liveable communities
3 Support areas of economic and district strength
4 Ensure critical infrastructure meets future needs

A2.2 Activity Contribution to District Vision, Outcomes and Priorities

Table 2: Activity Contribution to Outcomes

Vision	Community Outcomes	Activity Contribution to Outcomes	Activity Support to Strategic Priorities	
			Strategic Priorities	**Activity Service Statement**
Lifestyle We live in a pretty special place. We want to keep it that way. We want to make it even better for ourselves, our children, their children. **Economy** Our economy is essential to our future. We need it to grow innovatively and sustainably **Identity** We want to forge and strengthen a reputation and identity that makes us the envy of other places. **Leadership** We want a district where we build on our strengths, minimise our weaknesses, challenge our threats and grasp our opportunities. This takes leadership.	High Quality Infrastructure to meet community and business needs	Provision of quality stormwater systems that meet district needs.	(1) Investing in community (2) Promote integrated, highly liveable communities (3) Support areas of economic and District strength (4) Ensure critical infrastructure meets future needs	(1) Provide good quality stormwater infrastructure (2) Provide sustainable stormwater services that protect people, properties and the environment (3) Ensure long term affordability of stormwater services through appropriate maintenance of the assets (4) Plan for stormwater infrastructure to meet future community needs
		Provision of stormwater systems that cater for future growth and development.		
	Smart economic success supported and enabled	Provision of cost-effective stormwater services.		
	Communities that are safe, vibrant and growing	Provision of safe stormwater treatment and disposal that protect and maintains public health.		
	A valued, healthy and accessible environment			
	People enjoying a high quality of life	Provision of stormwater systems that showcase excellent customer service standards.		
	A strong identity forged and promoted	Support to quality of life that Timaru District can be proud of		

A3 CHALLENGES IN THE NEXT 10 YEARS

1 Increasing environmental standards - these are driven by national and regional initiatives to improve environmental quality. The most significant influence over the next ten years will be the Canterbury LWRP. This plan sets discharge requirements on stormwater, and conditions for installing and using stormwater infrastructure.

The LWRP requires a commitment to progressive improvement of stormwater discharges to meet water quality standards by 2025. There are significant cost implications in meeting these requirements in terms of new or additional assets that may need to be acquired and stormwater quality improvements that need to be carried out (e.g., riparian or creek improvements, etc.).

Meeting the requirements of the LWRP will be a major focus of the stormwater activity over the next ten years. TDC is required to prepare Stormwater Management Plans (SMPs) for all stormwater catchments in the district, as a prerequisite when applying for resource consent to discharge stormwater. Modelling of stormwater levels and flows in catchments is one major component of SMP development. With the number of catchments in the Timaru District, this is a significant task that requires substantial expenditure in the stormwater activity.

2 Resourcing and Enforcement – associated with the increased environmental standards is a need for a more robust administration and enforcement program with appropriate resourcing in order to mitigate the risk of breaches of stormwater rules and resource consent conditions.

3 Monitoring stormwater and the receiving environment – Council lacks specific information to support more effective stormwater planning and decision making. Investigations are necessary to determine actual levels of contaminants in the district's stormwater and the level of degradation of the receiving environment that are attributable to stormwater discharges.

4 Secondary/overland flow paths – secondary or overland flow paths are currently not clearly identified and protected and this needs to be addressed. They are important to mitigate localized flooding where obstructions in the primary stormwater network impede the flow of the run-off.

5 Climate change - climate change predictions are for more intense rain events to occur more frequently in the district. Particular attention must be paid to areas prone to flooding or nuisance ponding where existing stormwater infrastructure has insufficient capacity.

6 Asset renewals/upgrades – there are legacy issues with the existing stormwater infrastructure due to the significant growth and land use changes that have occurred from when the pipes for the main stormwater drains were originally designed. Since then, more impervious areas have been created and there are now greater stormwater flows and volumes going into the piped networks. Also, historically, the

district's stormwater networks were designed to collect stormwater and transport it as quickly as possible to discharge largely untreated stormwater to the receiving environment. Council needs a strategy to ensure that asset renewals will meet the required level of service, including retrofitting to meet treatment and attenuation requirements.

7 Growth and development – growth and land use changes have several impacts on stormwater management in the district. The challenges associated with these are:

a. Getting appropriate standards applied and implemented with new development, redevelopment and renewal of assets;
b. Ensuring that building and solid fencing do not contribute to the degradation of secondary stormwater flow paths and short-term storage areas;
c. Limiting creation of impervious areas in stormwater catchments. If more areas are built-up, or with increasing in-fills, more natural spaces for stormwater are occupied and more impervious areas are created. This puts greater pressure on the existing capacity of stormwater pipes/systems and will increase infrastructure requirement to manage stormwater flows; and
d. The additional cost of extending the stormwater infrastructure.

8 Economic sustainability - an increasing community expectation is for an improved service. However, TDC must balance these expectations with the ability of the community to pay and the need to plan effectively for the District's future needs.

9 Community understanding of stormwater - there is greater effort required to educate the public on stormwater responsibility. Consumers need to be aware of their responsibilities to onsite devices for treatment of water quality and assist TDC with quantity issues.

A4 PLANNING ASSUMPTIONS

Table 3: Stormwater Planning Assumptions

Assumption That these conditions hold true in the next 10 years (2018-2028)	Confidence Level			Risk/Uncertainty	Risk Level			Consequence of variation to assumption	Mitigation
	High	Med	Low		High	Med	Low		
1. Council Political Structure and Asset Ownership There will be no changes to the Council's political structure. Council will remain involved in the stormwater activity and continue to own and control all stormwater assets.	✓			Changes in Council's political structure are made. Changes in ownership or control of stormwater assets are required.			✓	May adversely affect the level of service provided to the community and TDC's ability to recover capital costs.	Any changes in political structure will occur through either representation review processes or formal processes driven either by the community, Council or central government. Changes in control or ownership of strategic assets must occur as part of an LTP development or amendment, with a formal process required through the Local Government Act.
2. Useful Life of Significant Assets It is assumed that asset information is reliable and reflects the condition and performance of the assets. It is assumed that no significant assets will fail before the end of their useful lives as determined by the depreciation rates included in the accounting policies.		✓		Significant assets fail sooner or later than estimated			✓	Renewals program is inaccurate and may have significant financial repercussions	Asset life is based on the estimates of engineers and valuers. These are regularly reviewed through asset monitoring and testing. In the event of assets wearing out earlier than anticipated, capital projects could be brought forward. This may affect borrowing and depreciation expenses. Negative impacts are likely to be at least partially offset by some assets lasting longer than estimated. Mitigation may also involve reprioritisation of the capital

									expenditure programme.
3. Levels of Service Levels of service will not significantly change.		✓		Communities demand or legislations impose increased levels of service.		✓		Increased or improved levels of service may require additional resources for TDC to provide them	Regular monitoring of existing service provision and review of levels of service through activity management planning and corporate planning processes. Significant changes in service levels will generally require increases to fees or rates, depending on how the service involved is funded, and will be confirmed with the community via consultation.
4. Demand Factors The District's population and household numbers are projected to increase, represented by Statistics NZ's medium projection scenario. The rate of the District's growth and development will be as projected in the Council's Growth Management Strategy. The demand for stormwater services will be within these projected levels.		✓		Population and demographic changes and other factors such as land use change are higher or lower than expected.			✓	Significant and consistent variation from projected levels may adversely affect TDC's ability to meet levels of service at an affordable cost. The activity may be over invested in infrastructure if growth rates are significantly slower than projected.	Council will continue to monitor changes in the District's population, household numbers, demography, and growth and development. Generally, small increases in population can be managed within the existing level of service. Declines in population will not necessarily result in a lower number of ratepayers as the number of people per household is declining. Where growth requires additional infrastructure (e.g. subdivisions), Council can currently require financial contributions for this work. Costs over this amount may result in additional Council expenditure which is likely to be funded out of debt.
5. Legislative Demands Government legislation	✓			The impact of government legislation is more or less	✓			Compliance with new legislation may have an impact on infrastructure and/or	Monitoring of legislative changes.

	relating to stormwater will change over this plan period.				than expected. New legislation is introduced that alters the nature and scope of Council's provision of stormwater services.			operating costs of providing stormwater services. Higher cost requirement may lead to additional cost to residents or rate payers.	
6.	**Climate Change** Climate change will impact on Council's operations and will require an appropriate response to adapt and prepare for potential adverse effects on the performance of the stormwater infrastructure.		✓		Effects of climate change are more or less severe than expected		✓		May create additional costs to increase stormwater network capacity and place pressure on Council finances.	Maintenance of the stormwater network. Building appropriate mitigation responses into infrastructure development. The Council will continue to monitor climate change science and the response of central government and adapt its response where required.
7.	**Resource Consents** Resource consents will be obtained with reasonable conditions.	✓			Resource consent is not obtained or conditions imposed are unacceptable.			✓	The non-granting of resource consent would have significant impacts on costs and the ability to provide stormwater services. Non-granting of resource consents may also delay benefits to the community.	Appropriate planning for resource consent applications should ensure that they are obtained.
8.	**Availability of Contractors and Materials** Contractors and materials will be available to undertake the work required to agreed standards, deadlines and cost.		✓		Projects could be delayed if there is a shortage of contractors or materials or contractors cannot deliver to agreed standards, costs and timeframes		✓		Might increase cost and/or delay projects or mean something is delivered to a lesser level of service.	Spread capital projects as much as possible. Continue to engage with contractors. Ensure robust contracts are in place. Look at alternative resources.
9.	**Natural Hazards/Local Disaster** There are no significant local disasters during the term of this Plan.		✓		Natural disasters occur that have a significant impact on the district and Council services.		✓		A disaster event can potentially cause significant unbudgeted costs, beyond the capacity of the Council to cope.	Council is a member of the Local Authority Protection Programme Disaster Fund Trust (LAPP) and has a variety of insurance cover which would cover some

									emergency works. Council also has a Disaster Relief Fund for the replacement of infrastructural assets in the event of a natural disaster. Central government has a role in disaster recovery after a natural disaster.
10. Costs, Inflation and Currency and Oil Price Fluctuations Costs will remain stable. The inflation factor used in cost projections is based on the Local Government Cost Index as used in the Long Term Plan (LTP). Currency fluctuations will not cause significant variability in stormwater activity costs. Exchange rates are forecast to remain unchanged from current rates. Oil prices will continue to fluctuate due to international influences and exchange rate movement.			✓	Costs are higher than anticipated. The rate of inflation differs from that assumed. Exchange rates fluctuate more than expected. Oil price fluctuations are greater than expected.		✓		Variability in costs may impact on the ability of Council to complete programmed work within budget. A significant change in inflation will result in changed revenue and expenditure. This could be significant and may adversely affect the ability of the Council to set rates at a level that is affordable to the community. Variability of prices from international suppliers could cause variability in Council costs.	The Council will review its budget annually through the LTP/Annual Plan process and may adjust work programmes/budgets where necessary. Council purchases goods predominantly from New Zealand suppliers with contracts in New Zealand dollars. Currency exchange rates and oil prices will be continually monitored. Work programmes may need adjustment depending on the scale of any changes.
11. Asset Depreciation and Revaluation Asset depreciation rates will not change as shown in the Accounting Policies. Council has adopted deemed cost as its approach to revaluation of significant assets.	✓			Further work on planned capital works may alter the depreciation expense. Minimal risks as revaluation of stormwater assets will not occur within this plan period.			✓	Increased depreciation costs would result from assets that have shorter useful lives.	Asset life is based on the estimates of engineers and valuers. These are regularly reviewed through asset monitoring and testing. Negative impacts are likely to be at least partially offset by some assets lasting longer than estimated. Revaluation affects the carrying value of fixed and infrastructural assets and the depreciation

									charge in the years subsequent to the revaluation. Council's deemed cost approach to revaluation applies to stormwater assets and no annual revaluation is required within this plan period.
12. Funding Sources and Rating Base Funding sources and the rating base for the stormwater activity will not change significantly.		✓		Projected revenue from user charges or financial assistance is not achieved. Levels and sources of funding differ from those forecast. The rating base could grow at an increased rate or could contract.		✓		Revenue could reduce without the ability to reduce expenditure proportionately. This could result in projects being revised or alternative funding sources used. An increase in the overall rating base could result in a decrease in rates for rating units as the total rates are spread across a larger base. If the rating base was to reduce, there could be an increase in rates.	Levels of revenue from user charges have been set at realistic levels in accordance with the ratios outlined in the Revenue and Financing Policy. Funding for projects and assets is considered before the commencement of each project or asset. A significant impact from changes in funding or funding sources may result in a revised capital work programmes, or changes in the level of user fees and charges, borrowing or rating requirements. The rating base is reviewed annually when determining the rates for the year.

A5 THE ACTIVITY

A5.1 ACTIVITY DESCRIPTION

TDC provides stormwater services in the urban townships of Timaru, Temuka, Geraldine and Pleasant Point. The schemes range from piped to open channel systems and comprise TDC's primary stormwater networks. Stormwater is disposed to soakpits, surface water bodies (e.g. drains, rivers) or the ocean, depending on the scheme.

Rural stormwater is managed mainly through land drainage with minimal conveyances provided in Winchester, Cave and Pareora.

The management of stormwater is critical for the safety of the community and the protection of public and private property. If not effectively collected and drained, stormwater can become a significant hazard and can cause damage to structures and properties. However, the discharge of stormwater also has the potential to cause adverse effects on the environment and subsequently the well-being of communities. The natural attributes of rivers, lakes and other freshwater bodies can be degraded by excessive sediment and contaminant inputs or by the flow rates and volumes of stormwater discharges. Council has a responsibility to ensure that stormwater is managed in a manner that sustainably supports the environmental, social, cultural and economic well-being of the communities it serves.

This Stormwater AMP does not cover management of rain water run-offs on roads which is the responsibility of TDC-Land Transport Unit (LTU). The LTU provides kerbs, channels and other drainage facilities to drain and treat stormwater from the road carriageway. The drainage facilities assets include small culverts (<3.4m$^{2)}$, surface water channels, sub soil drains, and sump (catchpits) assets (refer to Section 10.11 of the Transport AMP, document #692938).

This AMP also does not cover flood protection and control which is the responsibility of the Regional Council.

A5.2 ACTIVITY RATIONALE

TDC's involvement in stormwater services emanates from the purpose of local government, as stated in the Local Government Act 2002, which "provides for local authorities to play a broad role in meeting the current and future needs of their communities for good quality local infrastructure, local public services and performance of regulatory functions." (Part 1, Section 3d).

Stormwater services are vital to the quality of life and public health of Timaru District's residents. It is seen as being for the collective benefit of the Community for Council to act on behalf of the users to provide stormwater services, and there is also a community health factor benefit.

A5.3 Significant Effects of the Activity

This Activity is intended to have significant positive effects. These are the benefits to the community:

- Systems contribute to safety of people and property via collection and redirection of stormwater.
- Effective stormwater systems help prevent disruption to economic activities during extreme weather events.
- Systems ensure rainfall run-off is quickly and efficiently removed.
- Low impact design systems when not used for stormwater purposes provide open green space for people to enjoy.

Table 4: Negative Effects and Mitigation Measures

Negative Effect	Mitigation
- Highly engineered stormwater systems may result in the loss of connected community green space along waterways in urban centres, which is of increasing value to communities.	- Alternatives to traditional stormwater control using low impact design techniques (e.g. swales, retention dams) are being investigated and used where possible in new developments or retrofitting existing areas.
- Highly engineered stormwater systems in urban areas can have a significant negative impact on the downstream environment.	- Alternatives to traditional stormwater control using low impact design techniques (e.g. swales, retention dams) are being investigated and used where possible in new developments or retrofitting existing areas. - Systematic identification, prioritisation and implementation of system improvements will be used to help address environmental effects.
- Poor quality stormwater runoff can be discharged into coastal and surface waters.	- Alternatives to traditional stormwater control using low impact design techniques (e.g. swales, retention dams) are being investigated and used where possible in new developments or retrofitting existing areas. - Systematic identification, prioritisation and implementation of system improvements will be used to help address environmental effects.
- Adverse impacts on property resulting from damage to secondary (or overland) flow paths	- District Plan provisions for overland flow paths are being reviewed with management, protection and maintenance improvements to be identified and resourced

- Absence of or an inadequate stormwater system can have severe economic effects for communities	- Systems are designed to a certain capacity based on the community's ability to pay. These can potentially be exceeded in severe weather events.
- Localised adverse impacts for property result from blocked or damaged stormwater drains during storm events.	- Renewals, maintenance, and prompt responses to reactive issues minimize the impacts.

A5.4 Activity Contribution to Sustainable Development

The Principles Relating to Local Authorities stated in Section 14 of the Local Government Act 2002 provides that: "in taking a sustainable development approach, a local authority should take into account -

- the social, economic, and cultural interests of people and communities;
- the need to maintain and enhance the quality of the environment; and
- the reasonable foreseeable needs of future generations."

The IIMM 2011 defines sustainability as "the capacity to endure; in the context of AM it is about meeting the needs of the future by balancing social, economic, cultural and environmental outcomes or needs when making decisions today."

The principle of sustainability is reflected in the statement of the Activity Rationale (Section 2.2) which, in line with the purpose of local government, seeks to meet current and future needs of communities. The following practices demonstrate specific ways by which TDC is actively integrating sustainability in various aspects of delivering stormwater services:

1) Staff have been actively involved in community groups established by ECan to determine the rules for managing the environmental flow requirements to sustain and ultimately improve the health of the rivers. Section 14 of the LWRP is due for a review in 2017/18. Included in the review will be sub-regional rules which may differ from the regional rules set out in the LWRP. To facilitate the review a number of additional catchment groups are being established. TDC participates in the review via these community groups.

2) Less reliance on chemical inputs in stormwater treatment processes

3) Compliance with environmental standards in resource consents

4) Promoting sustainable use of stormwater services through consumer education and technical assistance provided by TDC

5) Overflow reduction in the network system

6) Application of asset management practices to facilitate asset renewal at the most appropriate time considering age, material type, maintenance history, and other asset condition factors

7) Carbon footprint reduction through low impact engineering designs

A6 Level of Service

A6.1 Key Service Drivers

The Stormwater Activity Levels of Service are primarily driven by the need to meet legislative and other mandatory requirements, fulfil customer expectations, and maintain affordability of the service.

Key Legislation

1) Local Government Act 2002

The Act defines good quality local infrastructure as efficient, effective and appropriate to present and anticipated future needs. TDC ensures it adheres to this mandate through the life cycle management of the stormwater assets.

2) Resource Management Act/Resource Consents

In providing stormwater services, TDC must comply with requirements set out in resource consents. The new stormwater discharge consents that need to be obtained by 2018 will include a commitment to progressive improvement of stormwater discharges to meet water quality standards by 2025. LWRP requires treatment and attenuation of stormwater prior to disposal to waterways and the ocean.

3) Local Government Non-Financial Performance Measures Rules

These Rules set out mandatory performance measures that TDC will need to monitor, measure and report on in its Annual Report. There are 4 performance measures for reporting on stormwater services specified in these Rules.

Customer Expectations and Affordability

Consumers expect that TDC's stormwater services will match the demands and growth of the Timaru District. There is often an expectation that stormwater services will be available for new development areas and for expansion of delivery areas on the periphery of existing networks.

Consumers generally need to feel that they are getting value for the rates and charges they pay. When rates and charges increase, the community consequently expects that there will be an improvement in the services they receive, either in the form of reduction in issues or higher quality of customer care.

The next section discusses Council's process for customer engagement.

A6.2 Customer Research and Expectations

How do we engage with our customers?

The decisions that Council makes affect communities. Some decisions are more significant than others, depending on the issue. Smaller operational decisions typically require little, if any, engagement with the community. More significant decisions may require a robust decision-making process and extensive consultation with the community.

As required under the Local Government Act, TDC has developed and adopted a Significance and Engagement Policy which provides a framework to identify the level of significance of an issue, give some clarity to communities about expectations of engagement on issues, and to ensure a local authority has identified its strategic assets. (The full policy can be read on the TDC website.)

Within the Long Term Plan process, community engagement is through the LTP Consultation Document (CD). The CD contains the key issues, preferred options and alternatives that Council requests the community to provide feedback on. For this LTP period, stormwater management was a major community matter included in the CD.

Other means to gather customer feedback include the following:

1) Customer service desk – for lodging service requests and to give feedback on Council's services
2) TDC website – an option to carry out customer transactions and/or provide feedback online. Council also promotes the use of the smartphone application "Snap-Send-Solve" for instant reporting of issues by anyone in the community.
3) Social media – TDC's Facebook page provides an interactive means of communication on projects, notifications, etc.
4) Noticeboard – Council publishes a weekly Noticeboard in the Courier Newspaper and Timaru Herald. This includes information on Council services, public notices, meetings and other information.
5) Council or Community Board meetings – opportunity for members of the public to ask questions of, or put a particular case to the Council or the Community Board on policy matters or matters relating to a particular ward
6) Inspections – visit by TDC technicians/officers/agents. It provides an opportunity for customer feedback
7) Annual Plan consultations – for gathering comments, suggestions and other submissions on proposals contained in the plan
8) Community survey - a 2-yearly survey of user and the general public satisfaction with TDC's services
9) Specialised stakeholder meetings – needs-based meetings with identified stakeholder and special interest groups on particular issues affecting the community
10) Specialised customer survey/research – needs-based study of consumers who may be affected by particular stormwater issues

TDC will continue to rely on these mechanisms to get customer feedback on Council's stormwater services and determine any gaps in the levels of service.

A6.3 LEVELS OF SERVICE

TDC's stormwater services provide a primary stormwater network that can accommodate rain events up to a 1 in 5 year return period for urban residential areas, and a 1 in 10 year return period for industrial and commercial areas, without the inundation of habitable floor spaces. This level of service may result in stormwater ponding in roads, parks and private properties for these rain events. Secondary stormwater flow paths (or overland flow paths) provide escape routes for rainfall in excess of the capacity of the primary stormwater network. These are identified in the District Plan.

Table below describes the levels of service for the Stormwater Activity.

Table 5: Community Outcomes and Stormwater Activity Levels of Service

COMMUNITY OUTCOMES	ACTIVITY CONTRIBUTIONS TO OUTCOMES	CORE VALUES	LEVELS OF SERVICE
High Quality Infrastructure to meet community and business needs	Provision of quality stormwater systems that meet district needs	Quality	Maintain excellent stormwater network service
	Provision of stormwater systems that cater for future growth and development	Responsiveness	
Smart economic success supported and enabled	Provision of cost-effective stormwater services	Affordability	Deliver affordable stormwater services
Communities that are safe, vibrant and growing	Provision of safe stormwater treatment and disposal that protects and maintains public health	Safety	Deliver stormwater services according to the required environmental standards
A valued, healthy and accessible environment			
People enjoying a high quality of life	Provision of stormwater systems that showcase excellent customer service standards	Efficiency	Maintain excellent customer service
A strong identity forged and promoted	Support to quality of life that Timaru District can be proud of	All of the above	All of the above

The Levels of Service represent a balance between the desired service standard and the cost of providing it. These were established formally with the development of Council's Long Term Council Community Plan in 2003, and are reviewed during each of the 3-yearly updating cycles of the Long Term Plan.

There are no significant changes in the LOS statements in this AMP.

Performance Measures and Targets

Performance measures and targets have been defined for each LOS. These consist of a mix of customer and technical performance measures, the core of which are monitored for the Annual Report. The technical measures relate to legislative compliance and asset performance while the customer performance measures relate to quality of service and value for money.

A number of technical measures are also held for internal monitoring by D&W of its organizational performance, as the primary manager of this Activity. These internal measures are not included in the Annual Report to the public.

Local Government Mandatory Non-Financial Performance Measures

The *Non-financial Performance Measures* mandated by the Local Government Minister have been incorporated in AMP since the last LTP updating cycle in 2015. Council is required to report to the Local Government Minister on these performance measures.

Analysis of Performance

Key performance data are analysed for significant variation from the LOS.

Key performance data are also trended and analysed to identify any recurrent issues and use the information to plan the necessary work/intervention.

Necessary works to address LOS issues are reflected in the financial plan.

Refer to Table 6 below for a summary of information on the Stormwater Activity levels of service, performance measures and yearly targets.

Table 6: Stormwater Activity Levels of Service, Performance Measures and Targets 2018-2028

Levels of Service	Performance Measure (PM)	Target			
		2018/19	2019/20	2020/21	2021-28
(1) Maintain excellent stormwater network services	(LTP) Mandatory PM 1 (system adequacy): (a) The number of flooding events that occur in a territorial district (b) For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to the territorial authority's stormwater system	(a) Zero flooding for rain events up to a 1 in 5 year return for residential zones, and a 1 in 10 year return for commercial and industrial zones (b) Zero habitable floors affected by a flooding event	(a) Zero flooding for rain events up to a 1 in 5 year return for residential zones, and a 1 in 10 year return for commercial and industrial zones (b) Zero habitable floors affected by a flooding event	(a) Zero flooding for rain events up to a 1 in 5 year return for residential zones, and a 1 in 10 year return for commercial and industrial zones (b) Zero habitable floors affected by a flooding event	(a) Zero flooding for rain events up to a 1 in 5 year return for residential zones, and a 1 in 10 year return for commercial and industrial zones (b) Zero habitable floors affected by a flooding event
	(Int) Analysis and reporting of flooding events	Report on analysis of flooding events	Report on analysis of flooding events	Report on analysis of flooding events	Report on analysis of flooding events
(2) Deliver stormwater services according to required environmental standards	(LTP) Mandatory PM 2 (discharge compliance): Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of: (a) Abatement notices (b) Infringement notices (c) Enforcement orders, and (d) Convictions received by the territorial authority in relation to those resource consents	No abatement notices, infringement notices, enforcement orders and convictions	No abatement notices, infringement notices, enforcement orders and convictions	No abatement notices, infringement notices, enforcement orders and convictions	No abatement notices, infringement notices, enforcement orders and convictions
	(Int) Complete the development of Stormwater Management Plans (SMP) and apply for discharge consents as required under the Land and Water Regional Plan	Geraldine, Timaru Urban, Temuka and Pleasant Point SMPs completed and resource consents applied for.	Timaru Washdyke SMP completed and resource consent applied for	Other SMPs – to be identified	Other SMPs – to be identified

(3) Maintain excellent customer service	(LTP) Mandatory PM 3 (response times): The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reaches the site.	Median time to attend a flooding event will be less than 1 hour	Median time to attend a flooding event will be less than 1 hour	Median time to attend a flooding event will be less than 1 hour	Median time to attend a flooding event will be less than 1 hour
	(Int) Response time to service requests	85% of service requests are responded to within required timeframes	85% of service requests are responded to within required timeframes	85% of service requests are responded to within required timeframes	85% of service requests are responded to within required timeframes
	(LTP) Mandatory PM 4 (customer satisfaction): The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system.	10 or fewer complaints per 1,000 connected properties	10 or fewer complaints per 1,000 connected properties	10 or fewer complaints per 1,000 connected properties	10 or fewer complaints per 1,000 connected properties
	(LTP) Stormwater services user satisfaction levels (Determined from 2-yearly community survey)	No survey this year	≥80% of users are satisfied with stormwater services	No survey this year	≥80% of users are satisfied with stormwater services (in 2-yearly survey continuing from 2019)
	(LTP) Stormwater services overall satisfaction levels (Determined from 2-yearly community survey)	No survey this year	≥75% of District residents are satisfied with stormwater services	No survey this year	≥75% of District residents are satisfied with stormwater services (in 2-yearly survey continuing from 2019)
(4) Deliver affordable stormwater services	(LTP) Operating cost of stormwater services	Actual operating cost within budget	Actual operating cost within budget	Actual operating cost within budget	Actual operating cost within budget

	(Int) Economic sustainability	Calculate and report on stormwater charges as a percentage of the median income of Timaru households	Calculate and report on stormwater charges as a percentage of the median income of Timaru households	Calculate and report on stormwater charges as a percentage of the median income of Timaru households	Calculate and report on stormwater charges as a percentage of the median income of Timaru households

A6.4 SERVICE DELIVERY

TDC owns all the public stormwater infrastructure assets. Core service functions of asset operation and management, inspection, project supervision and response to customer service requests are carried out in-house by staff of TDC's Drainage and Water Unit. Refer to D&W organizational chart in Figure 5 below.

To augment in-house capacity, TDC uses private contractors on need-basis to carry out identified tasks such as: i) maintenance and repair of the network; ii) physical works to build or renew assets; iii) some pre-engineering/engineering designs; iv) special studies in support of planning/policy development; and v) modelling scenarios. In general, contracting of works/services to the private sector is permissible and justified for reasons of cost effectiveness and when a specialist skill is required.

LGA Sec17A review

As required by legislation, TDC carried out a preliminary review of the effectiveness of existing service delivery arrangements on Council activities to determine which activities will require full Section 17A review prior to August 2017.

In the case of the Stormwater Activity, it was recommended that a Section 17A review will not be undertaken as the exception clauses of Section 17A apply, namely:

- The significant contract for network repairs and maintenance will not be expiring in the next 2 years (as at October 2016);
- Having considered the variety of governance, funding and service delivery options listed in Clause 4 of Section 17A, the cost of carrying out a review of the stormwater service may be affordable but the potential incremental benefits are unlikely to be substantial enough to outweigh the costs (direct and indirect).
- A review of the stormwater service delivery may be premature until after discharge consents are obtained. The consents may have conditions which can then be the basis of an assessment of the appropriateness and/or adequacy of current arrangements.

Contract Management

TDC's civil works procurement and contract administration follows the provisions of NZS3910: 2013 NZ Standard Conditions of Contract for Building and Civil Engineering Construction. Relevant provisions of NZS3910 are also used to procure and administer service contracts, such as for maintenance works, consulting services, etc.

The maintenance of the reticulation is contracted out in a single contract, currently Contract 2080 (document #812087). The Maintenance Contract requires the contractor to have qualified staff to deal with all systems malfunctions within the specified response times. When urgent repairs are required, the Maintenance Contractor is authorised to undertake all work as necessary to make the asset safe, or to stabilise the site/situation.

Although the facilities' operations are carried out by TDC in-house operators, assistance for specialist work is often contracted out. A variety of engineering firms assist and Industrial Controls South Canterbury do most of the electrical work.

The DWU has a register of Approved Contractors (TRIM document #444130) who are authorised to work on the TDC reticulation once appropriate approvals are obtained, either through the service consent or engineering plan approval processes. New connections where the consumer meets all the costs must be done by any approved contractor.

A Contractors Liaison Meeting is held annually to discuss issues and provide an indication of Council's yearly work programme.

Service Quality Standard

Activity management practices are carried out to TDC's standard of service quality, policies and approved procedures; and in accordance with Council's adopted industry-recognised or accepted technical standards of practice, as contained in the following key documents:

- TDC Drainage and Water Code of Practice
- Operations Manuals (pump station)
- TDC Drainage and Water Unit Health and Safety Manual
- TDC Corporate Management Policies
- NZ Engineering Standards
- Local and international best practices (e.g., International Infrastructure Management Manual 2015)
- Other industry-recognised standards

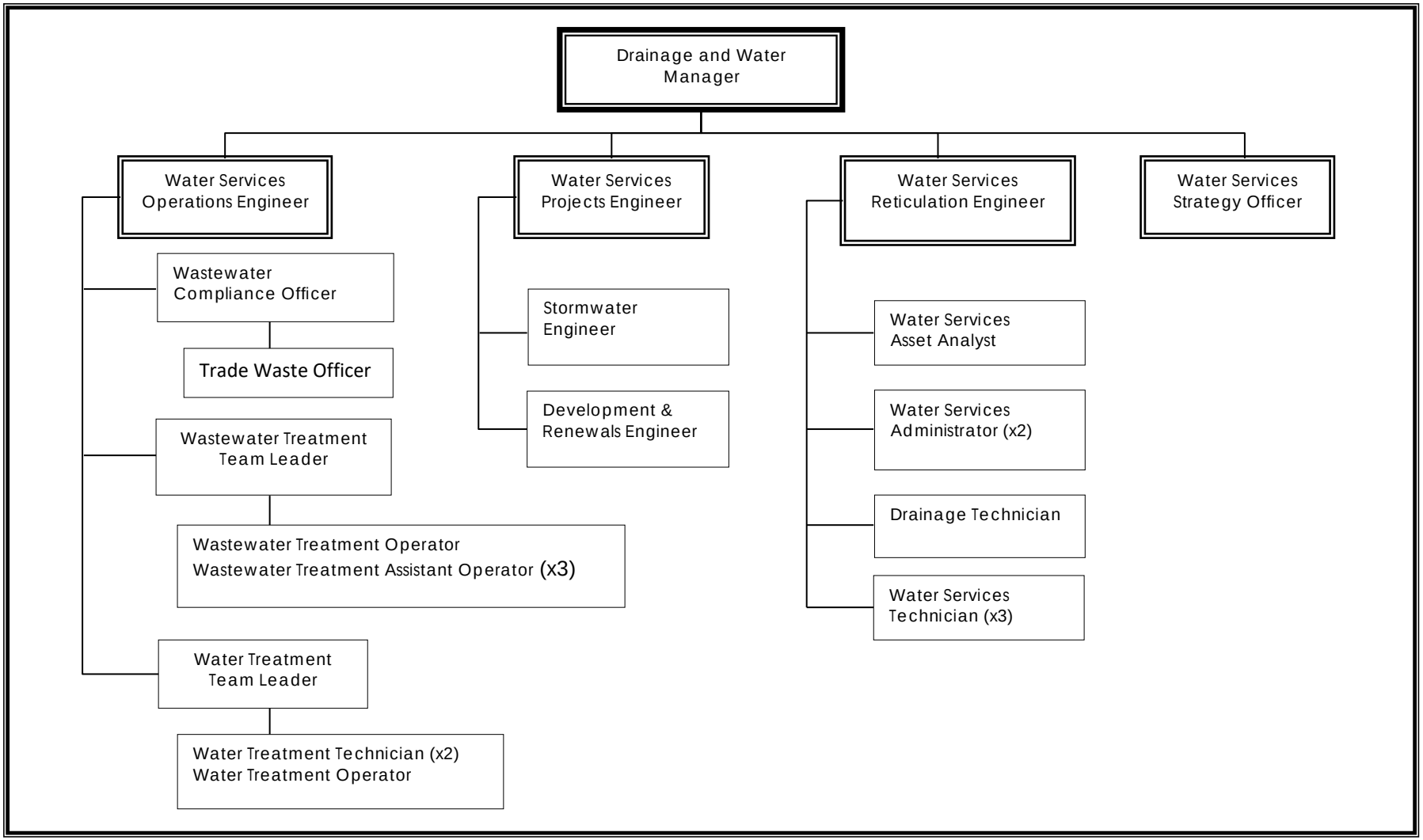

Figure 5: Drainage and Water Unit Organizational Structure

A7 Demand Forecasting and Management

A7.1 Assessment of Demand Drivers

1) Resource Consents and other Policy Requirements

The resource consents that TDC will obtain from 2018 will require improvement of stormwater discharges to meet water quality standards by 2025. LWRP requires treatment and attenuation of stormwater prior to disposal to waterways and the ocean. These requirements will shape the renewals and/or development of stormwater assets.

2) Climate Change

Climate change is a high profile issue in New Zealand. The impacts on demand relate to the increased intensity of rainfall events. Studies of the district's rainfall data show it is more likely more intense rain events will occur more frequently (document #644012, document #644018, #971499).

The impact of this increase is that the existing stormwater systems may not meet the intended level of service. To address this, TDC is implementing alternative low impact design solutions to manage storm water runoff. Also, stormwater catchment analysis will be carried out and stormwater control strategies will be developed from which secondary flow paths can be established.

3) Land Use Change and Development

Growth and land use changes result in an increase of stormwater flow rates and volumes through the creation of impervious areas (i.e. concrete and paved surfaces), an increase of the accumulation of contaminants and the degradation of secondary flow paths. Lifestyle shifts over time have also increased impervious areas significantly from when the pipes for the main stormwater drains were originally designed. Historically, stormwater networks were designed to collect stormwater and transport it as quickly as possible to discharge largely untreated to the receiving environment. This has resulted in legacy issues that now must be addressed.

Although growth within the district is not projected to be at a high level, population and household number changes will still impact on stormwater services in the next 30 years. As more areas are built-up, or with increasing infill development, more impervious areas are created with increased levels of contaminants and there is further potential for the natural paths for stormwater flows and soakage to be occupied. This puts greater pressure on the existing capacity of stormwater networks which increases the infrastructure requirement to manage stormwater flows.

4) Changes in Technology

New technology provides more options to managing stormwater runoff. It provides opportunities to improve control of runoff volumes and removal of contaminants to mitigate degradation of receiving environment. TDC is keeping up to date with technological developments, particularly low impact design (LID) options appropriate to local district settings.

5) Community Expectations

Users expect that TDC's services will match the future demands and growth of the District. Community expectations for the delivery of services are constantly increasing for an improved environmental quality. TDC balances these expectations with the ability of the community to pay and the need to plan effectively for the district's future needs.

The drainage bylaw which covers stormwater reticulation will be reviewed in line with new requirements under the RMA/LWRP, and consumer education intensified for greater awareness of their participation in keeping stormwater clean and free from pollution.

6) Contaminants and Pollutants

Council's stormwater discharges need to meet standards of quality. Contaminants come from point (e.g., hazardous industry) and non-point sources (e.g., roof material) and may not be easy to control. Road network use and traffic volume are a major contributor to stormwater contamination. The greater the contamination of stormwater, the greater will be the requirement for treatment of the discharge from the public stormwater network.

A7.2 Forecasting Future Demand

Forecasting stormwater demand is important because it addresses the negative effects of the discharge of stormwater on the receiving environment. It also allows an assessment of the impact of future demand on current levels of service and in turn determines the affordability of addressing impacts of changing demand.

Council's forecasting of future demand for public stormwater services takes into account the following:

- The location and timing of development or activities that create imperviousness and industry driven pollution. The draft Timaru Growth Management Strategy provides indication of the spatial direction, focus and intensity of development in the district in the next 30 years.
- Rainfall intensity patterns and its likely impact on the performance of the stormwater network.
- Construction trends that could potentially negatively impact stormwater (e.g. contaminant leaching from roofing or paint materials).
- Potential emergence of new contaminants to stormwater
- Traffic intensification that could result in greater amount of pollutants being washed off the roads into the stormwater drains.

A7.3 MANAGING DEMAND

Council manages demand through various approaches that are appropriate at the time of dealing with an issue. These consist of the following:

Asset-based approaches:

These are basically the asset life cycle management practices consisting of:

(i) Timely repair and maintenance of assets

(ii) Asset renewal

(iii) Asset (or system) improvement or upgrade

(iv) Incorporate Low Impact Design in asset projects where practical

Non-asset based approaches:

(i) Regulatory control – enforcement and monitoring compliance with consent conditions and stormwater bylaws

(ii) Catchment management planning

(iii) Develop stormwater code of practice and guidelines

(iv) New development to incorporate stormwater treatment and attenuation prior to discharging into Council network

(v) Education and community engagement

(vi) Stakeholder coordination

(vii) Financial instruments, e.g., user fees and charges

A8 ASSET KNOWLEDGE

A8.1 WHAT ASSETS DO WE HAVE

The asset register in Hansen holds information on the attributes of TDC's stormwater assets described below.

(1) Pump Stations

TDC currently has two stormwater pump stations located at Washdyke and Redruth in Timaru. Each pump station is equipped with the following:

- wet-well
- pump
- level monitoring or switching equipment
- PLC
- electrical switchboard
- pipework
- telemetry

Telemetry allows recording of instantaneous outputs and sending alarms. The frequency of storing data is every 15 minutes.

The telemetry computer (base station) is within the Drainage and Water Unit area TDC Office in King George Place.

(2) Detention dams and retention basin

The detention dams were built to catch and regulate the flow of stormwater runoffs. There are 2 detention dams in Geraldine, 1 in Pleasant Point, 2 in Gleniti (Timaru) and 1 at West End (Timaru). There is 1 retention and filtration basin in Temuka.

(3) Treatment structures

Currently, swales and soak pits provide a form of treatment for stormwater in Geraldine, Temuka and Pleasant Point.

(4) Reticulation

Reticulation includes pipes, manholes, sumps and bunds, open drainage channels, and secondary flow paths.

Pipes - the total length of the piped stormwater reticulation system that collects stormwater from properties to soakage pits or to natural bodies of water like rivers, streams and sea is about 146 km. Pipes range from a diameter of 100 mm to 2,550 mm.

Manholes – TDC's stormwater systems include some 2,344 manholes. The manholes are used at changes in pipeline grade, direction or diameter or as collection points for multiple private service connections. They are generally constructed cast in situ reinforced shafts or circular reinforced pre-cast concrete sections founded on pre-cast or site-constructed concrete bases, with concrete benching (fairing) from inlet pipe/s to outlet pipe.

Manhole roof slabs of generally pre-cast reinforced concrete span the manhole and provide support for the cast iron frames and circular cast iron access covers.

Soakpits - TDC's stormwater network includes around 216 soakpits to catchment areas that have good ground soakage system such as Pleasant Point, Temuka and Raukapuka in Geraldine.

Open drainage channels – this is using natural ground to convey stormwater rather than through a pipe network. It can provide treatment and slow the flow into the piped reticulation. There are about 33 km of open drainage channels in TDC's stormwater network.

Secondary/overland flow paths – these are escape routes intended for *one in 50 year* return rainfall events. Once the primary stormwater system has reached its maximum capacity, overland flow will occur along secondary flow paths, mitigating damage to properties/structures.

Tables 7 and 8 below provide a profile of the district's stormwater network.

Table 7: District Wide Stormwater Mains by Diameter and Length

Diameter Range	Sum of LENGTH	% to Total
0-150	14438	10%
151-225	32105	22%
226-300	23038	16%
326-375	13054	9%
376-450	10577	7%
451-500	11659	8%
501-600	15204	10%
601-700	2450	2%
701-900	11421	8%
901-1200	8172	6%
1201-1800	1238	1%
1800-2550	2555	2%
Grand Total	**145909**	100%

Table 8: District Wide Stormwater Mains by Material and Length

Material Type	Sum of LENGTH	% to Total
AC	4838	3%
BK	59	0%
CC	2459	2%
CC-Other	92750	64%
COIL	21	0%
EW	6285	4%
PE	870	1%
PVC	10703	7%

SN	141	0%
ST	313	0%
VC	133	0%
UNKNOWN	27336	19%
Grand Total	**145909**	100%

A8.2 Asset Condition and Performance

All assets have a nominal life, and should perform for that time. As the nominal life is near additional checks may be carried out. The asset may be good condition until failure occurs. This should be close to the life expectancy. If an asset has no redundancy then the replacement asset will be purchased and held as a spare when the nominal life is reached.

Asset physical condition is derived from CCTV inspection data, asset maintenance records, remaining life is based from the assumed expected life, and network performance is derived from the application of calibrated hydraulic models. Criticality is assessed relative to the risk and consequence of performance failure.

Unlike sewer assets which are subjected to daily flow, stormwater assets only operate during rain events. They lie dormant for a large portion of their lives.

a) Pump Stations

The Washdyke and Redruth pump stations were assessed in 2008. (Report filed in document #556938).

The Washdyke stormwater pump station was installed in 1971 with the life expectancy until 2011. The pump station is operated by diesel engine and the pumps are an obsolete technology which is considered to be ineffective pump system for a critical facility. In stormwater events failure of this pump station will result in surface flooding of the Washdyke business area. It was reported that the diesel tank is difficult to fill due to location of the filler point and the age of the engine and spares availability will become an issue.

The Redruth Stormwater pump station was installed in 1968 with life expectancy until 2020. In the event of pump station failure a large area of Southern Timaru floods unacceptably. It is reported that improvement to resilience and renewal on part of the pump station to ensure pump station failure is minimised.

The assets are situated above the ground and are readily accessible for inspection. The stormwater pumps can only be subjected to visual inspections for maintenance. They cannot be run without water in the system.

Plant performance is measured in a number of ways. These include:

- Maintenance records. On-going maintenance issues are a measure of plant performance that can result in further investigation.
- Telemetry. Delivery malfunction and water level alarms.

Periodically, consultants and suppliers are commissioned to complete electrical performance, capacity performance and confirmation of the renewal requirements for plant. This specialised knowledge will become more important as facilities age.

Stormwater pumps and motors have a long delivery time and ongoing operation is critical. These cannot be operated to failure mode and therefore more regular condition and performance monitoring and analysis is necessary.

b) Pipes

There is currently limited data held in the Asset Register on stormwater pipe condition that are based from physical investigations. Table 9 shows the effective life of stormwater pipes. Condition assessment used in this AMP's renewal programming has relied mainly on the pipe's maintenance history, age and criticality rating. Of the 145 km of stormwater mains in the network, about 27 kilometers (or 19%) of these have unknown material type.

Proactive and reactive CCTV inspection will be used to collect physical information on the stormwater pipes, re-assess asset life and condition, and improve data confidence level in the renewals programme.

Majority of the pipe performance issues were caused mainly by blockages either by debris washed down during the storm event or root intrusions within the system reducing the effectiveness to convey. There are some ineffective and undersize pipe identified which will be replaced and upgrade at time of renewal.

Table 9: Assumed Effective Life of Pipes by Type of Material

Material	Code	Effective Life (Years)
Asbestos Cement	AC	100
Brick	BK	100
Concrete	CC	120
Concrete - Others	CC-Other	150
Coil	COIL	100
Cast Iron	CI	150
Earthenware	EW	120
Polyvinyl Chloride	PVC	100
Polyethylene	PE	100
Stone Pipe	SN	100
Steel	ST	120
Vitrified Clay	VC	120
Unknown Pipe Type	UNKNOW	100

c) Manholes and Open Drainage

Condition and performance assessment is based on visual inspections carried out during routine maintenance visits. A detailed inspection of manholes on critical lines is on-going. Manholes are generally replaced at the time of reticulation upgrades.

Open drainage channels are inspected and maintained on a cyclic basis. Condition assessment is carried out during routine visits.

A8.3 Data Confidence

Data confidence in the condition of above ground assets is high as these assets are accessible and able to be checked routinely.

There is lower confidence in condition data for below-ground assets/pipes. The process to collect pipe condition data is established but levels of accuracy of data may decline with the age of the data (i.e., date when the assessment/survey was undertaken). Due diligence is exercised when using older data. Field validation is carried out as required to confirm asset condition before major works are undertaken.

Refer to National Performance Review Report Document #1034942 for data confidence ratings on pipes and facilities condition in 2015/16.

Data improvement is on-going by collecting proactive and reactive CCTV asset condition information for reticulation assets. Renewal Programme is subject to re-prioritization based on condition assessment results.

A9 ASSET LIFECYCLE MANAGEMENT

Council manages the life cycle of its stormwater assets through operation and maintenance planning for optimal asset utilization, and the identification and programming of capital works (i.e., asset development, renewals, upgrades, disposal) that will sustainably deliver the required level of service. The components of asset life cycle management are illustrated in the diagram below:

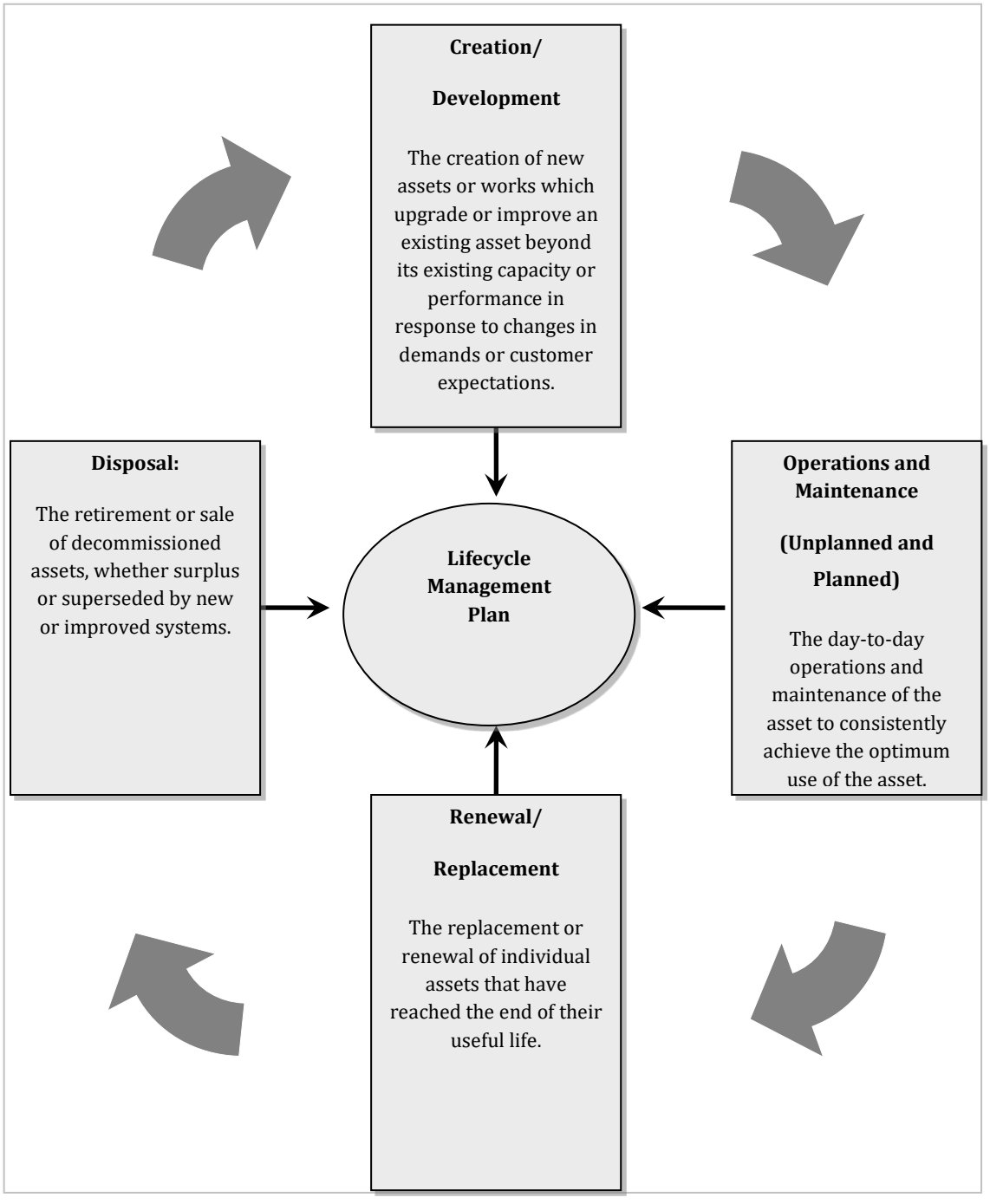

Figure 6: Asset Life Cycle Management Framework

The objectives of asset life cycle management are:

1. To provide and maintain assets economically and deliver services affordably
2. To deliver the following results:
    - Achieve the asset's service potential
    - Achieve customer LOS
    - Achieve health and safety standards
    - Reduce Council's exposure to risk from unforeseen asset failure

A9.1 Operations and Maintenance Planning

Operations cover the day to day activities that Council carries out to utilise the assets in delivering the required levels of service. Operational processes include maintenance or repair activities which are necessary to keep the asset operating.

Operations and Maintenance Strategies

1. Maintain existing assets to:
    - Achieve their service potential through efficient operation
    - Achieve customer levels of service
    - Achieve health and safety standards
    - Achieve legal compliance

2. Operate assets in accordance with defined procedures and standards including:
    - Pump Station supervision
    - Monitor compliance with resource consents
    - Audits on contract compliance
    - Auditing private stormwater systems that discharge into the district's public stormwater network
    - Safety audits to ensure compliance with the Health and Safety at Work Act and related policies

3. Optimise asset management practices and decision making by:
    - Implementing AIMS in all schemes
    - Documenting and developing business processes
    - Collecting asset management data
    - Monitoring flows to provide records of quantity and quality of the discharge
    - Carrying out surveys to determine the condition and decay rates of materials
    - Carrying out inspections in response to excessive maintenance trends
    - Monitoring the effectiveness of all preventative maintenance programmes and modify where necessary

4. Minimise asset ownership costs by:
    - Considering all life cycle costs or multi criteria analysis when evaluating asset renewal/acquisition options
    - Conducting electrical usage audits

- Considering new technologies
- Competitive tendering procedures for asset construction works
- Promote and implement water sensitive design where practical
- Ensure new developments to treat and attenuate stormwater on site prior to discharge into the district public stormwater network
- Public education initiatives

5. Manage risk exposure by:
   - Maintaining up-to-date fault detection systems and providing a prompt and effective response to system failures and pollution incidents
   - Maintaining appropriate insurance cover for key assets
   - Undertaking structural checks of key assets
   - Installing system backups to minimise risk of interruption to supply

6. With respect to asset condition and functionality, the overall maintenance strategy is to maintain the existing levels of service in a cost efficient manner.

Activities

(1) Core Operational Activities

TDC's in-house operators and service technicians carry out the following core activities:

- Administration/Engineering
- Contract preparation/supervision
- Data management
- Resource consent monitoring – quality monitoring for TDC discharge
- Stormwater quality monitoring - auditing private stormwater treatment discharge compliance
- Pump stations operation
- Telemetry check and monitoring of alarms
- Pipe network performance monitoring
- Public liaison

Assets are operated in accordance with operations manuals, procedures and defined processes, and to comply with relevant Acts, Regulations, Bylaws and Statutory Plans.

(2) Maintenance

The planned maintenance of the pumps is carried out by TDC operators during routine visits and who will use specialist assistance when necessary.

Maintenance of the reticulation is performed both in-house and by contract under Maintenance Contract 2080. Read details in document #812087.

The planning of maintenance is carried out by TDC staff in conjunction with contractors.

- The role of TDC staff is to identify the preventive maintenance requirements of the schemes and organise the reactive maintenance so that the work is carried out in a cost effective and timely manner.
- Preventive maintenance for the networks is issued once at scheduled times during the year and in some areas, twice or thrice yearly.
- The proactive maintenance packages are issued in bulk for "like" assets to City Care Limited currently contracted to TDC, who respond and report back to Council via technology-based systems. The information returned is held in TDC's Asset Information Management System (AIMS).
- Reactive maintenance is planned for by utilising technology and mainly City Care staff under the direction of Contract 2080. The contract specifies the acceptable repair methods, the maximum response time, sterilisation and sampling requirements as well as qualification requirements.
- The Service Request System that tracks customer complaints and requests for service is used for planned maintenance and inspection programmes. The reporting generated from the information returned to Council's AIMS is used to support the agreed levels of service, e.g., response times to be met within a certain period of time. Another example of the data use is analysis of chronic or extensive failures. All feedback from the Contractor is captured and analysed and effectively addressed.

A9.2 Capital Works Planning

This Section defines the strategies TDC follows in the planning of capital works for this Activity. Capital works include asset renewals/replacements, asset upgrades/improvements and new capital projects. Asset disposal is also covered.

Key capital projects for the next 10 years have been identified for particular schemes and are discussed in Part B.

A9.2.1 Asset Renewal Strategy

Renewals planning follow cyclic renewal strategies that provide for the progressive replacement of individual assets that have reached the end of their useful life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard, which reflects its age profile, and ensures that the Community's investment in the District's stormwater infrastructure is maintained.

The level of expenditure on cyclic asset replacement varies from year to year reflecting:

- The age profile of the system (asset life)
- Physical condition assessment of assets (sampling, CCTV, etc)
- Criticality of the asset
- Maintenance repairs
- Customer service issues
- Performance monitoring (e.g., inflow and infiltration analysis, overflow investigation, calibration of models)

Table 10 sets out the details of the renewal strategies. Figure 7 illustrates the renewals project decision flowchart.

Table 10: Asset Renewal Strategy

Strategy	Objective/ Description
Identification of renewal needs	Renewal/replacement needs are identified by analysing condition reports, maintenance records, AIMS data (asset failure and expenditure history), hydraulic performance, inflow and infiltration test reports, CCTV inspection sheet, service request records, telemetry and observations of staff and contractors. Renewal forecasts are based on an assessment of remaining asset lives. Industry base lives are used as a starting point and continually reviewed during condition and performance monitoring of plants and facilities, and the physical sampling of pipes. Telemetry alarms and customer feedback are essential for monitoring asset performance and achieving levels of service. The alarms and feedback are quite often the early warning system that a problem maybe developing and can lead to more formal investigations. Asset renewal programmes are prepared from specific renewal needs identified from the above information and assessed in conjunction with other departments within TDC (e.g Land Transport Unit) to coordinate the renewals. Long-term asset renewal programmes are prepared from the remaining life profiles for the assets.
Prioritisation of renewal projects	Renewal projects are assessed and prioritised based on the asset criticality, condition, maintenance history and frequency to the asset, estimated remaining life and future capacity requirement, and investment to the asset with the option of repair compared to the option of renewal. Refer to Section 9.3 (Risk analysis process in project renewals) Decisions on renewal works consider the short and long-term effects on the operating and structural integrity of the system. Renewal works are designed and undertaken in accordance with industry standards (or known future standards) and system design loadings. Short-term renewal priorities are reassessed annually taking account of additional information that becomes available.

Deferred Renewals	The quantity and impact of deferred renewals (if any) is tracked. Plant assets such as pumps (15 year life) and electronics (5 year life) are usually run to failure. This means that budgets may not be spent in the year expected. A critical asset will be purchased and held in stock awaiting failure. This results in budget underspending and carry forwards. The Council recognises that although the deferral of some items on cyclic renewal programmes will not impede the operation of many assets in the short term, repeated deferral will create a future Council liability. As Council currently funds asset renewals from depreciation deferred renewals are not expected or are minimised. Asset renewals may be deferred if there is a significant project planned that may benefit from a different asset within several years.

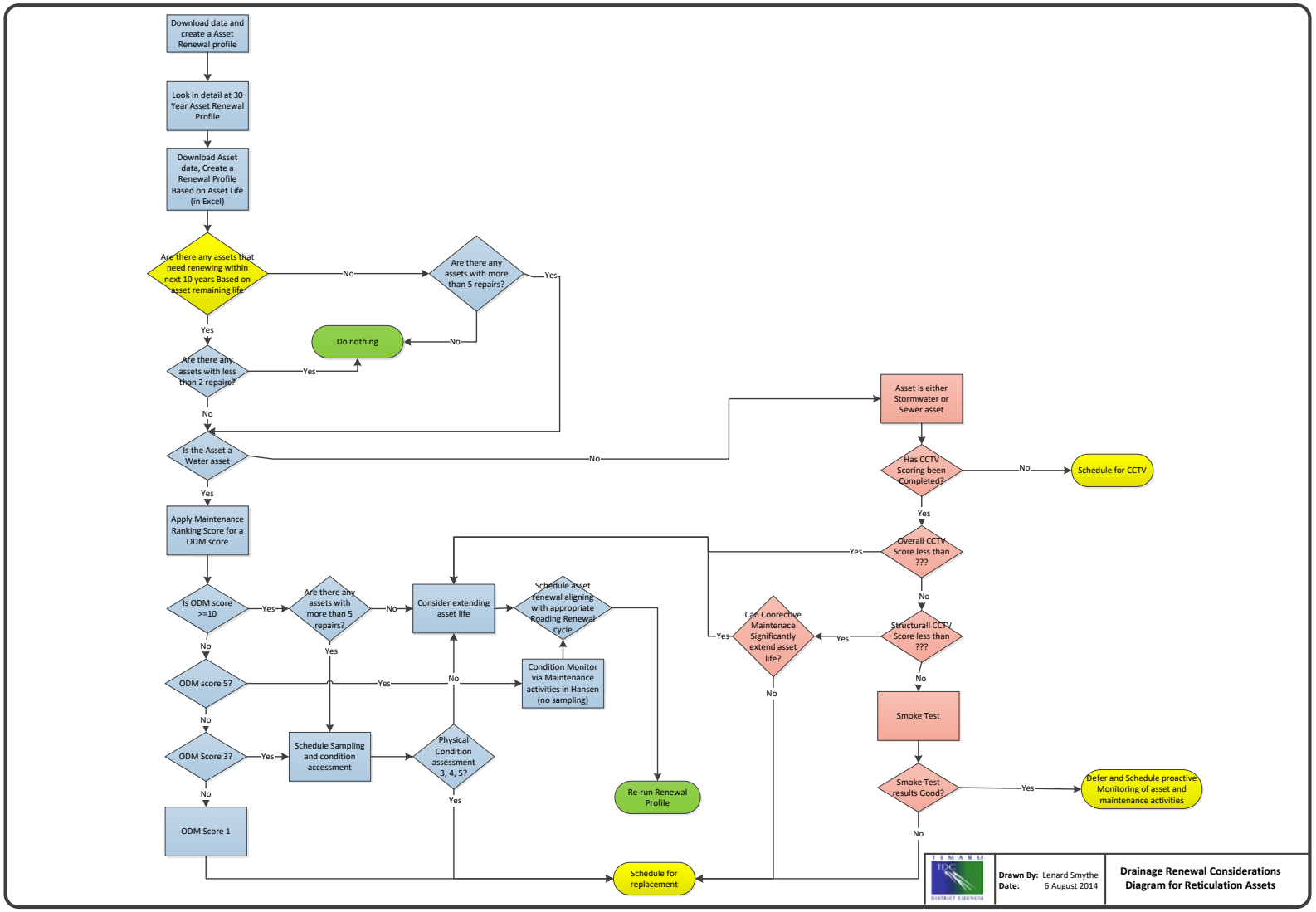

Figure 7: Pipe Renewal Decision Flowchart

A9.2.2 Asset Upgrading/Development Strategy

Stormwater systems will be developed to meet community expectations, technical and environmental standards and growth projections over the next 10 years.

Upgrading works and/or acquisition of new assets are identified on the following basis:

- Growth - ability to meet the most likely demand projections.
- Regulatory - expenditure needed to meet new regulations, for example modified resource consents as a result of Resource Management Act requirements.
- Operation efficiency - to reduce costs and improve efficiency.
- Consumer demand.
- Resilience to maintain levels of service.

The selection criteria for prioritising and programming of asset development projects is a function of Council preference, consideration of risk, costs and benefits, affordability and ranking with other projects.

Project approvals will be supported by an economic appraisal using cost/benefit analysis techniques which take into account:

- Capital costs of various options.
- Any change in net annual operating costs.
- Any change in annual maintenance requirements.
- Any salvage value of existing assets or components.

Within a subdivision the developer shall meet Council standards and specifications. On satisfactory completion the public portion of these assets will be vested in the Council.

A9.2.3 Asset Disposal Strategy

Council's strategy is to develop asset management systems and asset condition/performance data to allow better planning for the disposal of assets through rationalisation of asset stock or when assets become uneconomic to own and operate.

Assets may become surplus to requirements for any of the following reasons:

- Under utilisation
- Obsolescence
- Provision exceeds required LoS
- Uneconomic to upgrade or operate
- Policy change
- Service provided by other means, for example private sector involvement
- Potential risk of ownership (financial, environmental, legal, social, vandalism)

When considering disposal options all relevant costs of disposal are considered, including:

- Evaluation of options
- Consultation/advertising
- Obtaining Resource Consents
- Professional services, including engineering, planning, legal survey
- Demolition/making safe
- Site clearing, decontamination and beautification

TDC ensures that all pipeline renewals have a corresponding disposal either through the pipes being removed and disposed of at the landfill, or being left in the ground if the services are renewed using trenchless techniques or the asset is replaced in a new location. A work order report records each disposal and the details put in the AIMS database.

Similarly, replacement of components at treatment plants and pump stations usually involves disposal of those items being renewed/upgraded. These are disposed of in an appropriate manner with pumps and metal components sold for scrap metal.

Decommissioned assets, whether surplus or superseded by new improved systems, are disposed of through sale of surplus land, decommissioned pipes, mechanical and electrical equipment, and the demolition of structures.

A9.3 Risk Management

Background

Managing the risks associated with the Stormwater Activity is in accordance with Council's **Risk Management Policy** which adopted the Joint Australian New Zealand International Standard Risk Management – Principles and Guidelines (AS/NZS 31000:2009). Details of the Policy are in document #832395.

ISO 31000 identifies the following components of, and relationships within, the risk management framework (Figure 8).

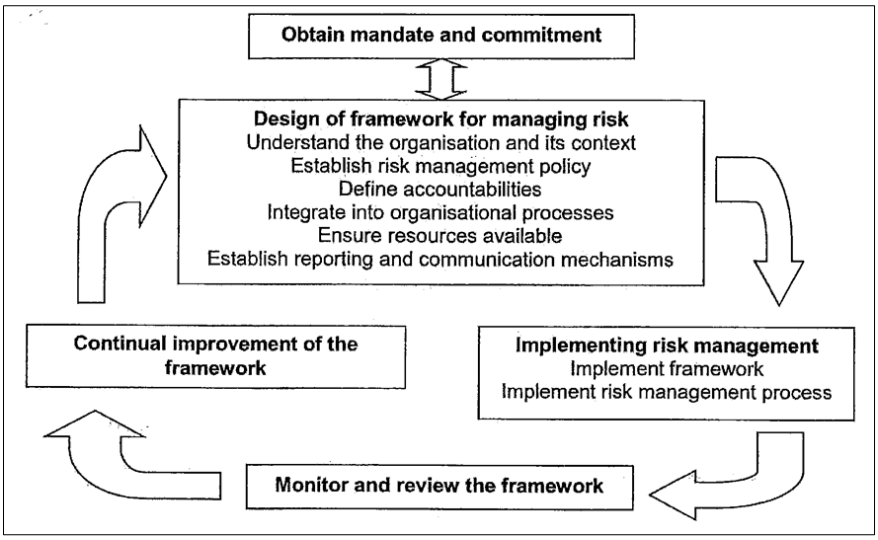

Figure 8: Risk Management Framework

ISO 31000 further identifies the following structure for the risk management process within the framework (Figure 9).

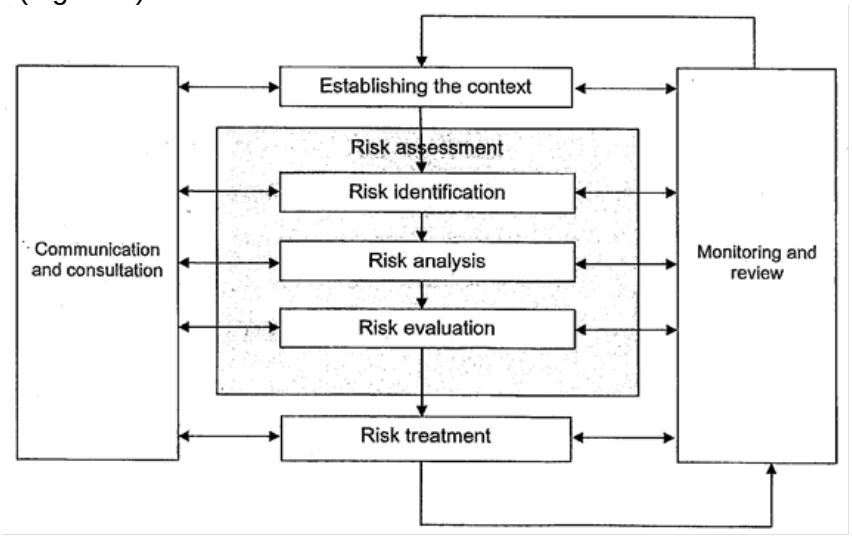

Figure 9: Risk Management Process

The Risk Management Plan for Council's 3 Waters (Water, Sewer, Stormwater) provides a detailed assessment of the sources of risks for the Stormwater Activity, including risk rating, consequences, treatment options, and mitigation measures (document #808045).

In summary, there are four categories of risk sources identified in TDC's Stormwater Activity, namely:

1. External - events largely beyond the control of the organisation like natural events and people.

2. Physical (Asset and Equipment) – events mainly associated with the failure of the assets and equipment.

3. Service Delivery – events largely caused by breakdown of operational processes, failure from service provider/contractors and human factors.

4. Management and Planning – events associated with human resource, designs, planning projections and assumptions and financial risks.

Consequence may range from insignificant, minor, moderate, and major to catastrophic. This is measured in terms of cost to public health, corporate image, environment, health and safety, third party damage or loss, and loss of revenue.

Treating the risks involves balancing what we need to do with what we can afford. Our treatment options include the following:

- Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk
- Taking or increasing risk in order to pursue an opportunity
- Removing the risk source
- Changing the likelihood
- Changing the consequence/s
- Sharing the risk with another party or parties
- Retaining the risk by informed decision

Most of the treatments identified during the assessment are already incorporated in existing business practices (e.g., aging assets are programmed for renewal, works are done by approved contractors, critical assets are identified, etc). Those that require significant cost to implement (e.g., additional treatment, additional infrastructure, etc) are being programmed. Specific details on risks and treatments associated with stormwater schemes are provided in Part B.

Summary of Significant Risks

For the current AMP period, the following risks remain as priority concerns in managing our stormwater schemes:

1) *Climate Change* - the risks associated with climate change relate to more frequent and intense rainfall beyond the design capacity of TDC's stormwater infrastructure. Intense rainfall events can cause overflowing of stormwater systems or flooding that may damage properties and may cause hazards to public health. There is risk of non-compliance with resource consents associated with this event.

2) *Asset Failure* – the risk comes from design capacity of existing assets potentially inadequate to meet the increasing intensity of stormwater flows brought about by climate change and development. There is also a risk of asset failure due to poor condition/age. The risk is amplified by the lack of formal regular assessment being undertaken or information being collected on the condition of the pipes in the reticulation network.

3) *Natural Disasters* - although the probability of occurrence is low, natural disasters such as earthquakes, floods, and snow storms present a high risk of loss of service or asset failure.

4) *Financial Uncertainties* – higher treatment requirements may result in significant cost increases passed on to consumers/rate payers. It may be unaffordable to consumers and may be a burden on ratepayers and a disincentive for people to live, work, and do business in the district.

5) *Financial Risk* – this is associated with the changing demographics of the district, a demand for an expanding infrastructure to serve more areas with the existing areas served by an ageing infrastructure. The cost to operate, maintain and renew the infrastructure increases while the community is getting older, with more people on fixed incomes, and fewer with less income per household.

Risk Treatment

The following comprise the major courses of action that will continue to be pursued to mitigate or eliminate the significant risks identified above:

- Monitoring telemetry and alarms
- 24 hour, 365 day call-out service
- Consumer education on proper stormwater disposal
- Private stormwater device auditing
- Infrastructure renewal and upgrade programmes
- Monitoring changes in the regulatory environment
- Close coordination with Council's Land Transport Unit and with developers to ensure that stormwater attenuation and treatment requirements are considered in road design and maintenance.

Risk Analysis Process in Asset Renewal and in New Projects

Prior to renewal, upgrade and development of assets, risk assessment will be carried out to consider all necessary mitigation options that can be practically actioned to isolate, eliminate or minimise the identified risk. The risk covers from the construction throughout the life-cycle of the asset.

Risk to Critical Assets

All major plant and reticulation assets have been rated for criticality (document #893451). The criticality rating, as described in Table 11 below, is based on the degree of importance of the asset in relation to potential loss of service.

Table 11: Asset Criticality Rating Scale

Criticality Rating	Level	Description
A	High	Asset components considered so important that contingency plans in the event of their failure must be in place to avoid unacceptable loss of service.
B	Medium	Asset components that is important to the effective day to day operation of the system where redundancy or contingency should be available for restoration of service within a reasonable time.

C	Low	Asset components which can fail without affecting the operation and service and where repairs or renewal can be realistically deferred.

TDC's high criticality stormwater assets include pumping stations, retention dams and culverts that if blocked would induce serious flooding of property, e.g., water inundation of living space in dwellings. It also includes assets whose restoration period may extend beyond the maintenance service delivery criteria in Contract 2080 and/or cannot function within those time frames due to energy supply and /or access availability.

The following are practices that mitigate the risk of failure of critical stormwater assets:

- Pump facilities are equipped with duty and backup pumps at the site. This enables a pump to be out of service for maintenance.
- Stormbeat – a pre-emptive clean-up of sumps, culverts and check of stormwater outlets to clear of blockages before any big storm event.

Criticality rating is used as a criteria in identifying renewal projects (refer to Section A9.2 Renewals Planning Strategy).

Table below shows the criticality ratings for the District's stormwater plant assets.

Table 12: Stormwater Facilities Criticality Profile

Facility	Rating	Back up power	Telemetry
Washydke PS	A	None	Yes
Redruth PS	A	None	Yes

The criticality assessment of the stormwater network was carried out in 2008 as a desk top study (document #903192). The ratings will be re-assessed in line with the collection of more robust pipe condition data in this AMP period which will be incorporate in the AIMS.

Part B of this AMP identifies the critical assets associated with the stormwater schemes in the urban areas of Geraldine, Pleasant Point, Temuka and Timaru, and how they are managed.

Resilience

TDC's Infrastructure Strategy defines the approach to resilience in infrastructure assets and services planning and management, namely:

- Resilience is based on a design philosophy which acknowledges that failure will occur.
- Resilience requires early detection and recovery, but not necessarily through re-establishing the failed system.
- To be resilient, planning needs to look ahead and respond to both anticipated and unexpected changes.
- The design of infrastructure can help alleviate the risk from natural disasters.

- More accurate physical condition assessment of assets can improve targeting of renewals and increase resilience of the infrastructure networks.
- Modelling Strategy implementation

Insurance of Assets

TDC's sewer assets are insured to the value of the cost to replace them. Insurance of the assets mitigates financial risks to TDC and increases resilience of the stormwater infrastructure to events that may damage the assets.

Emergency Response Management

The risk of disruption in services is an inherent element of operations. Notwithstanding the mitigation measures in place, incidents may still occur that disrupt services for maybe a few hours, a few days, or for a much longer period of time. The impact of these incidents could be minor, or in serious cases catastrophic.

There is currently a draft Crisis and Emergency Response Management Guidelines for TDC's Drainage and Water Unit, which outlines the general considerations in responding to incidents or events. Depending on the scale of an incident, D&W may or may not have an overall leadership role in response management. In all cases, however, D&W will be involved in incident response, and will be managing an Incident Control Point. TDC's operators are expected to be available on site to assist in response procedures.

The objectives of the guidelines are to:

1) familiarize TDC D&W staff of the relevant systems and procedures in place to deal with events that can cause disruption in services and have significant adverse impact to the health of the community;

2) increase readiness by all D&W personnel for crisis or emergency situations that have impact on the continuity of TDC's services;

3) clarify the roles and responsibilities of key D&W personnel who are expected to assist in emergency response operations;

4) identify contingency actions and resources and options in dealing with various scale and scope of emergencies;

5) contribute in attaining the aim of emergency management to prevent or reduce loss of life and property; and

6) comply with legislation (Civil Defence Emergency Management Act 2002 - Section 60 Duties of lifeline utilities)

Localised stormwater events (e.g., network overflows) are responded to by TDC's maintenance contractors who carry out clearing/cleaning operations. This could be a coordinated task for the Land Transport and the Drainage and Water units of TDC.

A10 Asset Management Information System

Information management covers asset data management and customer service information. Information is collected, processed, stored and maintained within various systems that make up the information network, as described below. Some component systems are enabled for interfacing to facilitate data accessibility, validation, analysis and reporting (refer to illustration in Figure 10).

Further work to enhance system linkages will be carried out as an improvement in this AMP period.

Asset Information Management System (AIMS)

Asset data management is primarily carried out using Infor 8, an asset management application for maintaining a register of assets and recording of information on assets.

Currently, the core data for assets in the AIMS underpins spatial representation of asset attributes and lifecycle information. This core data also provides the technical basis for the hydraulic modelling capability of the Council.

Hansen records:

- Asset information such as size, type, age, which can be linked to the GIS spatial database
- Maintenance history including time, cost, and performance indicators
- Work Order Data
- Condition Data
- Criticality
- Risk of Failure data (to be held in the future)
- Valuation Data
- Resource Consent Conditions monitoring data

The AIMS data for the stormwater schemes have been sourced from existing drawings and plans, which in turn came from original records and as-built. The data is subject to on-going checks via work reports from maintenance activities. Data build-up is ongoing.

Corporate Information Systems

TDC currently uses Civica's Authority as its Corporate Information System. This holds all the financial, rating and situation data. All customer requests or quality complaints or queries are held in this information system. This system also features a 24/7 Call-out Service where all complaints from the public can be reported in 24 hours.

A component of TDC's corporate information system is an electronic document management system using the HPE Records Manager (RM8) software. Other documents not saved in TRIM, such as stormwater models, are stored in a dedicated drive within the network.

TDC's website also hosts information on Timaru District's stormwater services such as fees and charges and occasional public advisories.

Hydraulic Models

Council does not have a hydraulic software to model stormwater schemes. Currently engagement with consultants with high performance stormwater modelling software and skills to provide outcomes and outputs of the model to Drainage and Water Unit to make assessment and strategies for efficient and sustainable stormwater management to the community consistent with the Council's Long Term Plan and the District Plan objectives. The models are used to assist in design, renewals and developments which can identify deficiencies in the networks and the impact that property development may have. Assets identified as not meeting the required performance criteria are then scheduled for renewal/upgrade.

Hydraulic modelling of the stormwater network enables TDC to:

- Determine accurately the existing capacity of the system
- Model scenarios to assess the impacts of climate change
- Model scenarios to assess impact of demographic, land use changes and predicted growth areas
- Identify key problem area or low performance area in the network
- Operate the system in the most efficient manner
- Identify and strategize network renewal and upgrade
- Evaluate options for network enhancement including new asset development to address quantity and quality issues
- Identify overland flowpath

The TDC Stormwater Model requires on-going calibration such as:

- Flood event information

Geographic Information System (GIS)

The information in the GIS database and the system's data transformation tools and analytical functions provide significant material for asset management and decision-making.

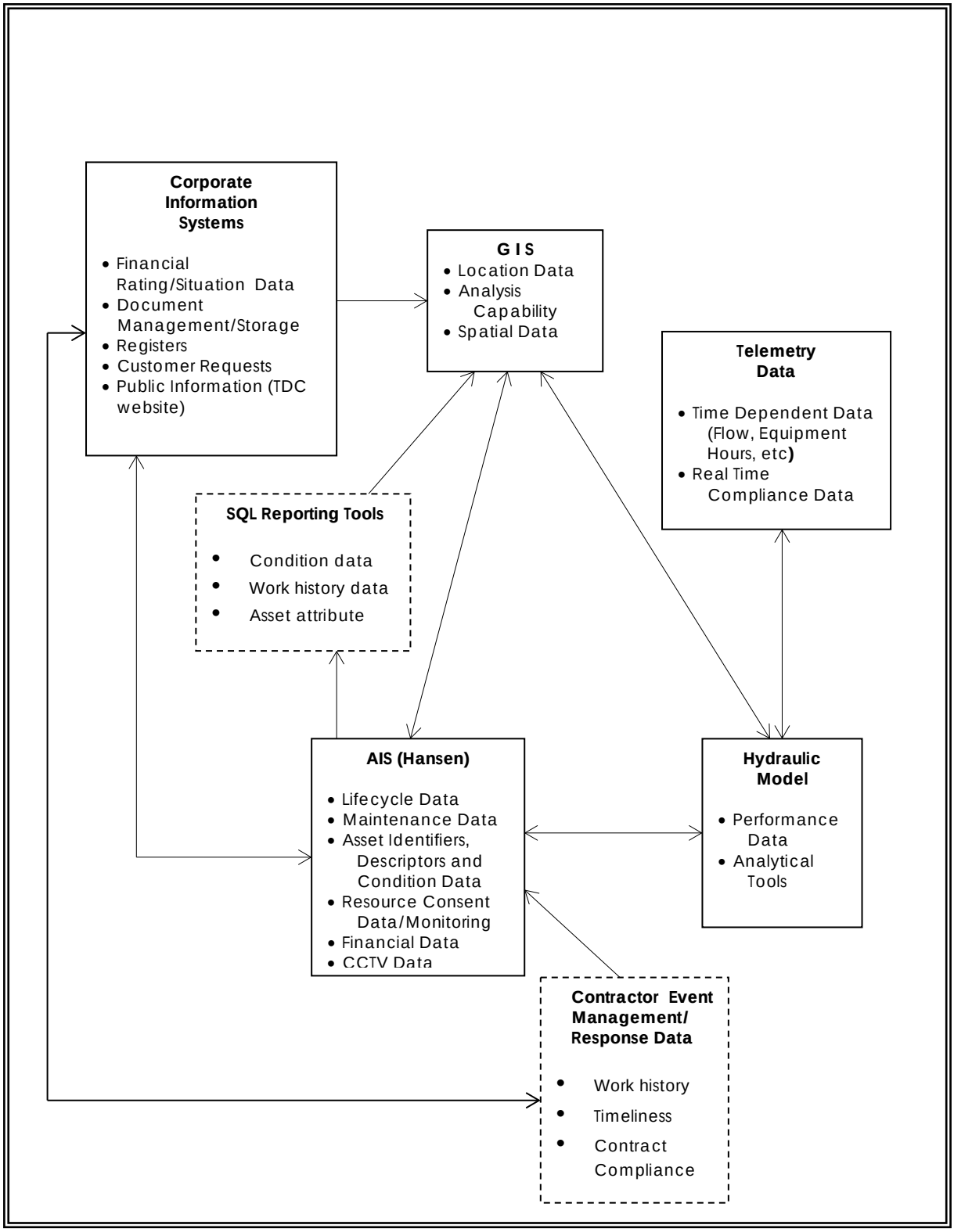

Figure 10: Stormwater Information Network

A11 FINANCIAL PLANNING

This Section outlines the considerations in planning the financial requirements for stormwater services. Capital expenditure projections are in Part B of this AMP. A 10-year financial projection is prepared for this AMP which will feed into the 50-year Infrastructure Strategy component of the Long Term Plan.

A11.1 TDC'S FINANCIAL STRATEGY

The financial strategy guides the way the Council makes decisions. The Council must, under the Local Government Act 2002, manage its revenue, expenses, assets, liabilities, investments and general financial dealings prudently, and in a manner that sustainably promotes the current and future interests of the community. The aim of the Financial Strategy is to define Council's financial direction for the next 10 years that is agreed with the community, drawn from a balancing of ratepayer affordability against community needs and aspirations. This balancing process will consider the impact on affordability of expenditure proposals on:

- the need to maintain, replace and renew core infrastructure,
- the obligation under law to build new infrastructure of a higher standard; and
- a desire to respond to the aspirations of the community for new and improved community infrastructure.

The Council will strive where possible to either hold steady or reduce Council's operating expenditure over forthcoming years while maintaining an acceptable level of service. The Council is also committed to shared services with other local authorities to minimise costs.

Inflation factor

TDC recognizes that inflation is faced by the Council and inevitably means the cost of providing services will increase over the next 10 years and these increases will affect the level of rates.

TDC's approach is to include inflation based on the Local Government Cost Index (LGCI) prepared by Berl Economics. Annually, budgets are reviewed to more accurately reflect price movements.

Asset development and renewal expenditure

Asset development expenditure is for purchasing, building, replacing or developing the district's assets. The A the key planning tool for the maintenance, future renewal and additional assets required to meet increased levels of services or growth in the district.

The council has developed the asset development programme assuming that all projects will be completed in the year identified in the plan. However, past experience shows that due to external factors there can be delays in the completion of the project. Therefore projects that have similar amounts and funding may be substituted from the later years of the plan for other projects which have experienced delays. Conversely projects that are delayed in one year of the plan will be completed in the following years.

Renewals are the replacement programme for the existing assets. Levels of service improvements relate to where the council increases assets to increase the level of service provided to the community. Growth assets are constructed to support the growth in the district and provide the infrastructure that is required by the future demand.

Renewals of assets are generally funded from reserves which have previously been funded from rates. If there are insufficient funds in the appropriate reserve for the renewal expenditure, council has elected to borrow to pay for some of the renewals.

Level of service improvements and growth assets are generally funded from debt, capital subsidy or from capital contributions in the form of contributions (financial contributions and cash in lieu of reserves). This is to ensure that the costs are spread across the generations that utilise the assets.

Financial Implications and Trends

In setting rates at an appropriate level, the council must balance what is affordable for both the Council and the community. This is a delicate balancing act which needs to take account of the services that the Council delivers and whether current or future ratepayers should pay for them or intergenerational equity. This is particularly important for the Council given that many of its assets have long service lives and the benefits that these assets provide are over a long period of time. The main tool used is to use debt and then rate future ratepayers to service the debt.

Targeted rates

Targeted rates account for approximately 52% of total rates revenue (48% are from General Rates and Uniform Annual General Charge) and are in place to fund specific activities including water, sewer, **stormwater**, waste management, footpaths, aquatic centre, rural fire, community boards and community centres.

The rate for local targeted rates such as community centres, water, **stormwater**, footpaths and community boards is set in consultation with the local community, taking into account the Activity Management Plan for each activity.

Overall Implications of the Financial Strategy

The Council is promoting a “Business as Usual” approach through its financial strategy. It will continue to maintain and renew our assets for current and future generations while providing the services that the community enjoy.

The implications of this strategy, combined with the requirement for prudent financial management, the necessity to manage a complex array of operations and assets with long lives, and continuing improvements in required levels of service stemming from either legislative change or community demand means that there is little room for further significant projects within the next 10 years.

The Council has designed its financial policies to be prudent and fair to current and future ratepayers. Current ratepayers pay for the services they have available to them now, including a contribution to the cost of replacing the infrastructure they use. All ratepayers, current and future, pay for the costs involved in improving the quality of services.

This approach will maintain the Council's sound financial position over the next 10 years and provide a sound base for maintaining the well-being of future generations.

A11.2 Revenue and Financing Policy

Council's Revenue and Financing Policy states that, because this activity provides predominantly community benefits to specific location, it is considered appropriate to fund the activity separately by community. Funding sources are:

Public – 100%, funded via a Community Works and Services targeted rate.

Private – 0%

Stormwater Fees and Charges

Information are in this link: https://www.timaru.govt.nz/council/publications/fees-and-charges/stormwater

Council will amend its fees and charges annually (or more frequently as appropriate) to reflect increases in costs as measured by the council rate of inflation and/or maintain the cost recovery levels underlying the basis for setting the fee levels.

A11.3. Financial Contributions Policy

Council is required to adopt a Development or Financial Contributions Policy under section 102 of the Local Government Act 2002 (the Act). Development Contributions provide Council with a method to obtain contributions to fund infrastructure required due to growth. The Timaru District Council does not intend to implement a Development Contributions Policy as outlined in Section 106 of the Act at this point in time. Timaru District Council has an operative Financial Contributions Policy as set out in Part D, Section 6 of the Timaru District Plan. The existing Financial Contributions Policy allows the Council to apply a charge for water, sewer, stormwater and open space and recreation. The financial contribution is a contribution from developers of cash or kind, or a mix of these. Financial contributions are provided for under the Resource Management Act 1991 and are used to offset or mitigate any adverse impacts on the natural and physical environment including utilities, services or a new development. Amounts to be funded from financial contributions for water supply, sewer and stormwater services will be determined from Council decisions at the time of development.

The cost of reticulation upgrade that is attributed directly to a property development is recovered from that development as financial contributions under the District Plan.

Capital contributions are charged when new connections are made to a sewer system. The contribution is dependent on the system and is calculated from impacts each new connection has on the system.

Some sewer systems do not have a financial contribution but all costs to connect are met by the applicant.

Details of the provisions can be found in the District Plan document under Section D: General Rules - 6.5: Water, Sewer, Stormwater and Open Space and Recreation Contributions.

A11.4 ASSET VALUATION

Asset valuation is key in TDC's financial planning. The responsibility to carry out asset valuation lies primarily with TDC's Finance and Property Units.

DWU carries out asset valuation for insurance purposes.

The stormwater assets were valued for fair book value and depreciation purposes in 2005. Additions subsequent to the valuation are recorded at cost. In 2013 the stormwater assets were valued for full replacement value for insurance purposes. As a result of the Christchurch earthquakes, Council revisited the insurance valuation and requested that a new valuation be produced. The final values were separated into *above ground assets* and *below ground assets*. The *below ground assets* are insured by Local Authority Protection Programme (LAPP). The *above ground assets* are insured by Council's general insurance policy.

Stormwater asset managers utilize asset valuation information in planning future work and cost to replace or renew fully depreciated/expired assets.

Asset Valued

The stormwater asset valuations completed in July 2005 (by Maunsell Ltd) covered the following asset groups:

- Mains and Service Lines
- Pump Station

The valuation was carried out in accordance with the NZ Equivalent to International Accounting Standard 16, "Property, Plant and Equipment" (NZ IAS 16), and the Infrastructure Asset Valuation and Depreciation Guidelines 2002 issued by the NAMS Group of Ingenium.

All assets were valued using optimised depreciated replacement cost (ODRC). An ODRC valuation requires determination of quantities of assets optimised to relate to those required for current service delivery and foreseeable demand, unit rates that reflect replacement with modern engineering equivalent assets, effective lives that take account of local influences, and depreciation that defines current value given a definable remaining life.

Optimised Depreciated Replacement Cost = today's cost of replacing the asset with another asset which provides the same level of service most efficiently and depreciated over the life of the asset to reflect its current value and remaining economic life.

The future forecast of asset values can be summarised as follows:

- Major capital expenditure will increase the asset value
- Vested assets from subdivisions will be added to the fixed asset register and will increase the asset value
- The asset renewal programme may increase the average residual life which in turn will progressively increase the valuation

Asset Depreciation

Council's Accounting Policy states depreciation is provided on a basis that will write off the cost or valuation of the assets, other than land, less their estimated residual values over their estimated useful lives. The rate of depreciation on sewer assets is set at 1-4% straight line.

Capital works in progress are not depreciated. The total cost of a project is transferred to the relevant asset class on completion and then depreciated.

Depreciation is fully funded from rates. TDC calculates depreciation fund requirement based on the long term projected renewals of the assets.

Valuation Forecast

Council currently has an accounting policy that Council owned assets of land, buildings and infrastructure are not revalued. At the time of adoption of International Financial Reporting Standards (IFRS) in 2005, Council approved this policy where the assets are recorded at their deemed cost as at 1 July 2005 with any subsequent additions recorded at cost.

The future forecast of asset values can be summarised as follows:

- Major capital expenditure shown in stormwater treatment works and pipelines will increase the asset value
- Vested assets from subdivisions will be added to the fixed asset register and will increase the asset value
- The asset renewal programme may increase the average residual life which in turn will progressively increase the valuation

Valuation for Insurance

D&W carries out asset valuation for insurance purposes. In 2013 the 3 Waters assets were valued for full replacement value for insurance purposes. As a result of the Christchurch earthquakes, Council revisited the insurance valuation and requested that a new valuation be produced. The final values were separated into *above ground assets* and *below ground assets*. The *below-ground assets* are insured by Local Authority Protection Programme (LAPP). The *above-ground assets* are insured by Council's general insurance policy.

The replacement value of stormwater assets is $159 million (2014 assessment).

A11.5 FINANCIAL PROJECTIONS 2018-2028

Part B of this AMP identifies the key capital expenditure items in the next 10 years.

The projected capital works and its associated financial requirements form the basis for the 10 year operating and capital budgets for this activity.

The 2018-28 Budget, once finalised, is available in a separate budget document (# xxxxxxxxx).

A11.6 KEY FINANCIAL ASSUMPTIONS, FORECAST RELIABILITY AND CONFIDENCE

All assumptions made in the financial forecasts are based on corporate level financial assumptions (refer back to section *A4 Planning Assumptions*).

Risks and confidence levels in the assumptions have been assessed and rated.

Mitigation measures have been identified to alleviate the consequence/s of any significant variation from the assumption. In particular, Council will review its budget annually and may adjust work programmes/budgets where necessary.

A12 IMPROVEMENT PLAN

Table below provides the status of actions on the Improvement Plant from the previous AMP period 2015-25.

Table 13: Improvement Plan 2015-25 – Status of Accomplishments

<table>
<tr><th>Management Practice</th><th>Improvement</th><th>Status of Accomplishment</th></tr>
<tr><td>Description of Assets</td><td>
Asset Register:

• Develop Hansen's use in the management of stormwater facilities (i.e., data, work orders, invoicing, etc)
• Implement data improvements -
o CCTV, investigation and location of the network asset to improve accuracy of the asset which can be incorporated as part of maintenance programme
o Investigation of "unknown" stormwater pipes and data recording in Hansen

• Implement workflow improvements
o updating of asset registers to include capital works as-built data, costs, etc

Implement information system improvements:

o Hansen-InfoWorks-TRIM documentation links
o Information upkeep (updating, quality checks, audit)
o Set up core reports from Hansen (e.g., for valuation, renewal forecasting)
Asset Condition:

• Develop and implement condition assessment programme and workflow
o Survey assets
o CCTV inspection
o utilise maintenance contractor for condition assessment/data collection when doing repairs
o quality audit of assessment data
o analyse and record condition data in Hansen

Asset Data Confidence:
• Formally assess and rate condition grade of assets and confidence grade of plant and reticulation asset data, using the IIMM as guide
o Benchmark condition grade of data held in the AIMS
<table>
<tr><th>Grade</th><th>Description</th><th>Accuracy</th></tr>
<tr><td>1</td><td>Accurate</td><td>100%</td></tr>
<tr><td>2</td><td>Minor inaccuracies</td><td>± 5%</td></tr>
<tr><td>3</td><td>50% estimated</td><td>± 20%</td></tr>
<tr><td>4</td><td>Significant data estimated</td><td>± 30%</td></tr>
<tr><td>5</td><td>All data estimated</td><td>± 40%</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Management Practice</th><th>Improvement</th><th>Status of Accomplishment</th></tr>
<tr><td></td><td>

Benchmark confidence grade of asset data in AIMS

<table>
<tr><th>CONFIDENCE GRADE</th><th>DESCRIPTION</th></tr>
<tr><td>A Highly reliable</td><td>Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%.</td></tr>
<tr><td>B Reliable</td><td>Data based on sound records, procedures, investigations and analysis documented properly but has minor shortcomings, for example some data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%</td></tr>
<tr><td>C Uncertain</td><td>Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which Grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%.</td></tr>
<tr><td>D Very uncertain</td><td>Data based on unconfirmed verbal reports and/or cursory inspection and analysis. Dataset may not be fully complete and most data is estimated an extrapolated. Accuracy ± 40%.</td></tr>
<tr><td>E Unknown</td><td>None or very little data held.</td></tr>
</table>

Incorporate asset condition grade and confidence ratings in the asset renewal strategy

</td><td></td></tr>
<tr><td>Levels of Service</td><td>LOS review: Identify LOS options and costs in consultation with communities
Develop robust methodology for analysing flooding events (install flooding level gauges, do model recalibrations, coordinate with LTU, etc)</td><td>- Done through LTP CD process</td></tr>
<tr><td>Managing Demand</td><td>Stormwater Modelling
Develop and Implement Stakeholder Education Programme</td><td>Modelling started</td></tr>
<tr><td>Risk Management</td><td>Develop a Risk Register
Risk Register Monitoring
Emergency Response and Business Continuity Planning
Project based risk assessments with regular revisions</td><td></td></tr>
<tr><td>Lifecycle Decision Making</td><td>Operational:
Monitoring and analysis of asset utilization
Improve staff knowledge of models used
Improve upkeep of models used
Adopt lifecycle based decision making (eg like the options of SW at Bay)
Develop a formal decision making process to evaluate all aspects of capital works
Implement sensitivity analysis to critical assumptions
Capital Works Planning:
Alignment with district plan objectives on subdivisions, etc. Model with these demands in place
Develop workflow to ensure capital projects for the next three years are fully scoped and estimated</td><td>- Capital works planning strategies developed and documented in the AMP</td></tr>
</table>

Management Practice	Improvement	Status of Accomplishment
Financial Forecasts	• Improve valuation process (towards enabling automation based from Hansen info) • Improvement within Hansen on asset replacement cost	•
AMP Format, Planning Assumptions and Confidence Levels, Planning by Qualified Persons	Internal Drainage & Water Unit user review Internal TDC peer review External expert review Review/Update DW Code of Practice AM Team: upskilling; formal/systematic coordination of projects (e.g., with land transport); formalized workflows (e.g., documenting and reporting procedures, etc)	- peer review within Drainage and Water Unit
Outline Improvement Programmes	Improvement Plan implemented. Improvements documented.	- items as indicated on this table
Council's Commitment	• Quality Management: (Linked to info system mgt) • Better coordination, communication between/among teams • Establish workflows (what staff needs to do, when, …) • Internal audit of work quality	•
Sustainability	Adopt core measures for monitoring sustainability of stormwater services	

Table 14 shows the **Improvement Plan for 2018-28**. It is a refreshed version based on the latest assessment of gaps in practice, in line with the preparation of this AMP. Details of the assessment are in Document#1043800.

Detailed action plans on the "Improvement Actions" will be developed as part of the implementation of the Improvement Plan.

Table 14**:** Stormwater Activity Improvement Plan 2018-28

No.	Area of Improvement	AMP linkage	Score/Current Practice	Score/Future Practice Required	Improvement Action(s)	Completion Date TBD	Responsibility
Understanding and Defining Requirements			51	83			
1	AM Policy Development	Section A1.1	(70) c/- Corporate Planning Unit	(80) c/- Corporate Planning Unit	c/ - CPU		
2	Levels of Service and Performance Management	Section A6	(60) LOS, PMs reported annually; communicating to customers via noticeboards, letter drops, newsletters, signages, Council's website; customer consultation through LTP process (CD), 2-yearly community surveys; and when required in major projects.	(75) Identify and analyse options to deal with recurrent performance issues, assess LoS implications and impact on customers. Customer consultation possibly required on new scheme strategies and potential LOS changes.	• KPIs/Performance Trending in the Unit Yearly Report • Develop a LOS consultation guidance document (including approaches; with inputs from Communications Manager) • Determine appropriate LOS based on LWRP requirements/- discharge consent conditions • Build dataset on location of stormwater flooding/ponding events/complaints to identify significant recurring issues		LG, GH
3	Demand Forecasting	Section A7	(45) demand scenarios and demand management is considered in strategic project development	(85) Stormwater models currently don't allow for future demand identified in the District Plan so renewal designs don't look at future capacity issues except for known high demand sites (eg schools for fire fighting); Model sensitivity not done; Scenario Analysis not investigated on designs and	• Develop a demand forecasting framework/strategy • SMPs with forward capital works programme • Structure plans for urban development		SC

No.	Area of Improvement	AMP linkage	Score/Current Practice	Score/Future Practice Required	Improvement Action(s)	Completion Date TBD	Responsibility
				documented. Demand forecast for rural sector is difficult.			
4	Asset Register Data	Section A8, A11.3	(50) Hansen 8 is used, functionalities include management of resource consents compliance data, asset financial valuation for insurance, etc.	(90) asset replacement cost (using Optimised Replacement Cost) needs to be in Hansen; remaining useful life to be calculated and ability to over-ride when condition has been assessed; adopt a condition assessment programme; formal documentation of data collection/maintenance process; build up service laterals data (not just mains); sample, investigate and locate rural network asset to improve accuracy; build up metadata. Develop Hansen's use in management of facilities.	• Improve accuracy of stormwater asset register • Improve data integrity • Plant and equipment to be included in annual revaluation • Plant programmed maintenance systems to be developed • Plant reactive maintenance to be captured		GC
5	Asset Condition (Monitoring Asset Performance and Condition)	Section A8.2	(45) Baseline asset condition ratings were established in 2012. There has been no formal audit of data quality, although data confidence is reported as high.	(85) Build asset performance and condition data. Adopt a condition assessment program and all sample assessment needs to be validated by competent staff or organisation. All sample assessments shall be well documented in RM8 and linked to Hansen database and the Model.	• develop and implement CCTV inspection programme for stormwater • improve/build condition data for stormwater network		SC, GC
Lifecycle Planning				74			
6	Decision Making	Section A9.2	(50) Asset Renewal Strategy is defined in AMPs and the IS. There is no formally adopted process for decision making and prioritisation applied to capital works programme.	(75) Undertake formal use of BCA/MCA, sensitivity test of assumptions and estimates	• Develop a capital expenditure strategy for stormwater renewals, upgrade, including treatment requirements		SC
7	Risk Management	Section A9.3	(45) Risks have been identified. Assets are rated	(75) Update risk assessment and management plan. Risk Register	• Update Stormwater Risk Register with well-	- same	SC

No.	Area of Improvement	AMP linkage	Score/Current Practice	Score/Future Practice Required	Improvement Action(s)	Completion Date TBD	Responsibility
			for criticality. Risk factored in in renewals programme.	developed, monitored and reported. Asset criticality assessment needs updating, previously only a desk top assessment. Consider resilience.	defined strategies to manage environmental risk as informed by LWRP treatment requirements/discharge consent conditions • Document the 'Risk Analysis Process' in asset renewal and in new projects • Document factoring of resilience in projects • Establish a procedure to add criticality rating of new assets in Hansen at project completion • "cleansing" of Asset Criticality data • Annual reporting on status of Risk Management Plan implementation (in unit report		
8	Operational Planning	Section A9.1	(40) The Maintenance Contract for the reticulation provides documented decision-making processes and procedures developed in consideration of associated risks and costs. Organizational structure and position descriptions reflect roles in operation and maintenance.	(70) Risk and opportunity planning (emergency, contingency, business continuity plans) and documented operating protocols (cost and budget management, security, operational risk management, environmental and sustainability management, reactive maintenance, preventive maintenance)	• Increase documentation of operational management in the AMP		ALL
9	Capital Works Planning	Section A9.2	(35) Capital works programme prepared for the	(80) Lack of formal prioritisation framework to rank capital projects;	• Document the project planning, scoping and		SC

No.	Area of Improvement	AMP linkage	Score/Current Practice	Score/Future Practice Required	Improvement Action(s)	Completion Date TBD	Responsibility
			next 30 years with firmed-up projects for years 1-3. Options analysis done for major projects.	projects in the 1-3 year budget not fully investigated and are often delayed to enable the options to be fully investigated. Also not fully scoped until the financial year in which the budget is available. The estimate in the budget may only be 30% accurate.	development processes with a view to identifying areas for efficiency improvement		
10	Financial and Funding Strategies	Section A11	(40) Asset revaluation done in 2005 (Maunsell report). There is collaboration between finance and asset managers in the setting of fees and charges, asset capitalization, depreciation, revaluation for insurance. Longer term financial forecast in IS? The AMPs provide comprehensive supporting data to enable long term financial forecasts.	(70) Need more robust asset data. Improvement within AIMS on asset replacement cost. Consideration of resourcing the LWRP requirements.	• Establish a good valuation data for asset insurance purposes • Ascertain LWRP treatment requirements/discharge consent conditions' impact on fees/charges		SC
Asset Management Enablers				75			
11	AM Teams	Section A1.5, A6.4	(65) AM coordination process is established for AMP updating. Position descriptions reflect AM roles but not emphasized as such (?). AM is seen as the responsibility of "managers" and engineers. There is a projects coordination team in District Services with representatives from concerned units.	(80) More AM awareness across the organisation. AM communications needs improvement so as not to result in piece-meal planning. Need consistent approach to AM across the organisation.	c/- CPU		c/ - CPU

No.	Area of Improvement	AMP linkage	Score/Current Practice	Score/Future Practice Required	Improvement Action(s)	Completion Date TBD	Responsibility
12	AM Plans	Whole AMP	(60) The AMPs' contents are aligned with IIMM requirements - LOS, risk and criticality, condition and performance, lifecycle management, demand forecasts, financial forecasts, improvement plan.	(75) It is possible that some AM practices are not adequately documented or described in the AMP.	• Increase/Improve documentation of AM processes		LG/Team
13	Management Systems	Section A10	(40) Work order procedures set up; resource consents management in Hansen. "isolated"; improve team coordination and communication; workflows; internal audit	(65) There is little formal documentation of processes or documentation is not shared; project management is too	• Corporate level - functional linkages across units – IT, finance, HR, CPU, etc) • Unit level: Improve linkages: - Registers link with insurance, service applications, etc - GIS and assets • Develop a D&W project management protocol for coordination between teams		GC/LG
14	Information Systems	Section A10	(50) See 2.4 Asset Register comments. Where we are: Some level of integration of Asset Register (Hansen), CRM-Authority, GIS	(80) Further develop integration of systems for reporting on wider range of information.	• Improve functionality of the Information System • Develop further integration of the Information System		GC
15	Service Delivery Models	Section A6.4	(70) Council's core functions are defined. Council has a procurement policy in place. Internal service level agreements are in place	(80) Formal cost-benefit analysis of options.	• LGA Section 17A Stage 2 Review within the Plan period. • Consideration of shared		GH

No.	Area of Improvement	AMP linkage	Score/Current Practice	Score/Future Practice Required	Improvement Action(s)	Completion Date TBD	Responsibility
			(employment contracts/role descriptions); external service provider contracts are in place (maintenance contracts); competitive tendering practice in place - no issues; service delivery mechanisms reviewed (Stage 1) under LGA Sec17A provisions.		services agreement (with other TAs).		
16	Improvement Planning	Section A12	(40) Current and future AM assessed and Improvement areas identified.	(70) No detailed implementation plan; no detailed project briefs for all key improvement actions; no monitoring and routine reporting; communicate improvements to staff.	• Detailed improvement plan with defined implementation actions • Documentation of improvements		ALL

PART B – THE FOUR URBAN STORMWATER SCHEMES

Stormwater Service Areas

The figure below shows the coverage of the District's urban stormwater services. These are the schemes servicing the townships of Timaru, Temuka, Geraldine and Pleasant Point.

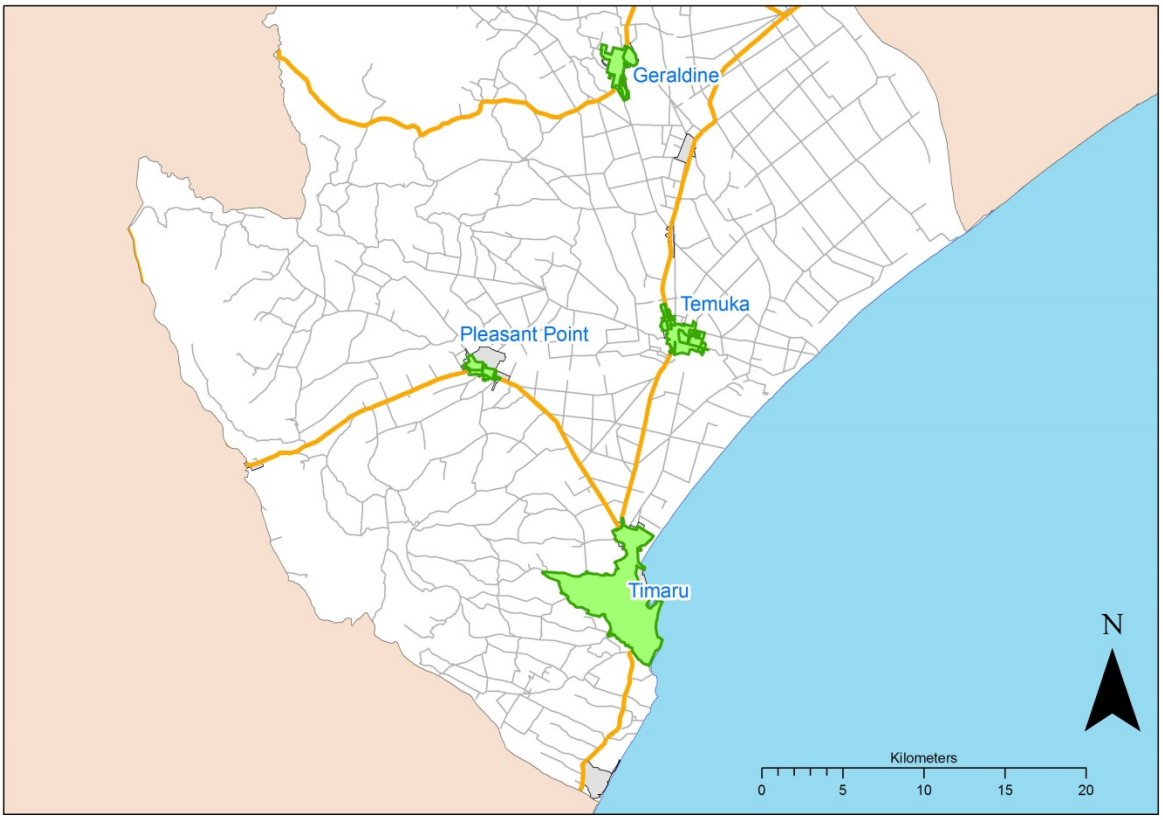

Figure 11: Timaru District Stormwater Schemes

The succeeding sections provide detailed information on the assets, issues and planned projects in each scheme.

B1 GERALDINE STORMWATER SCHEME

B1.1 SCHEME OVERVIEW

The Geraldine Stormwater Scheme covers an approximate area of 355 hectares (see overview map in Figure 12). Stormwater is collected and conveyed for discharge through a network consisting of pipes/constructed structures and natural open channels.

Geraldine is basically drained 3 ways:

- As direct discharge to creeks (Serpentine Creek and Slaughterhouse Creek) which then eventually flows down to Waihi River
- As direct discharge to Waihi River
- Soakage into ground (Raukapuka and some parts in the South of Geraldine catchment).

The existing resource consents in the Geraldine Scheme cover the following:

- CRC020339 – construction of detention dams
- CRC020340 – dam and divert water from Serpentine creek
- CRC020341) – discharge to watercourses during construction of the detention dams

All three consents will expire in October 2037.

Stormwater discharges in the Geraldine Scheme are currently partially treated. Once a discharge consent is obtained, in line with the requirements of the Canterbury Land and Water Regional Plan, the conditions for treatment of stormwater prior to discharge will be known.

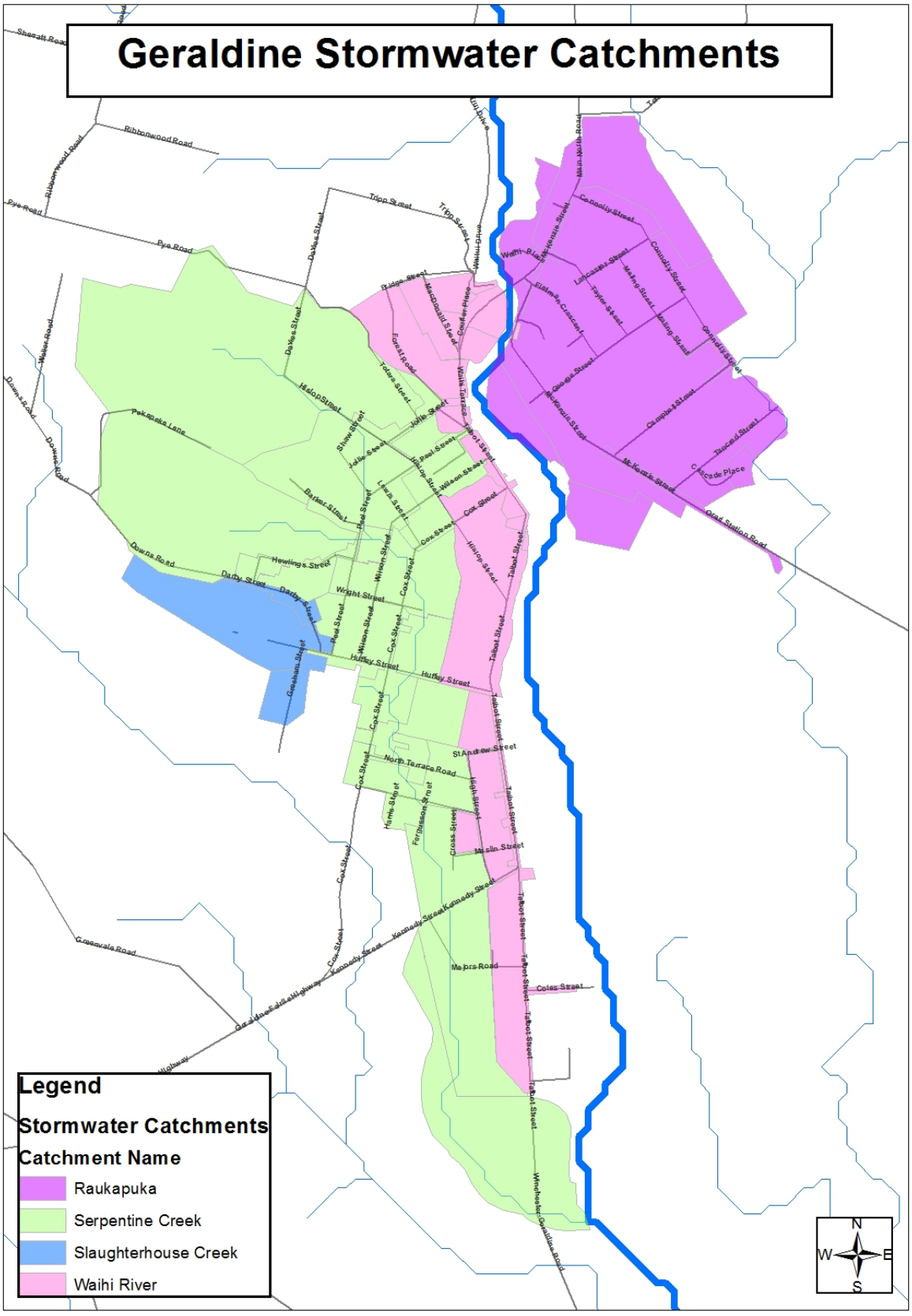

Figure 12: Geraldine Stormwater Catchments Overview

B1.2 Asset Summary

The Geraldine Stormwater Scheme consists of:

- 5.5 km pipe network and 6 km open channels
- 61 manholes and 67 soakpits
- 2 detention dams

Table 15: Geraldine Stormwater Network Profile

Type of Pipe Material	Sum of LENGTH
AC	244
CC-Other	3601
EW	245
PE	67
PVC	225
ST	8
UNKNOWN	1069
Grand Total	**5459**

B1.3 Asset Condition and Performance

The age profile of the network is shown in Figure 13.

The Geraldine stormwater network is currently assessed as being generally in good condition, based mainly from pipe maintenance history being minimal to nil over the last 10 years.

The open channels, manholes, detention dams and soakage pits are, likewise, assessed as currently being in good condition based on visual inspections carried out routinely during wet weather events when the functionality of the assets can be best observed. For those that are not performing well will be identified in the maintenance programme to increase the frequency to clean and monitored to determine whether replacement is required.

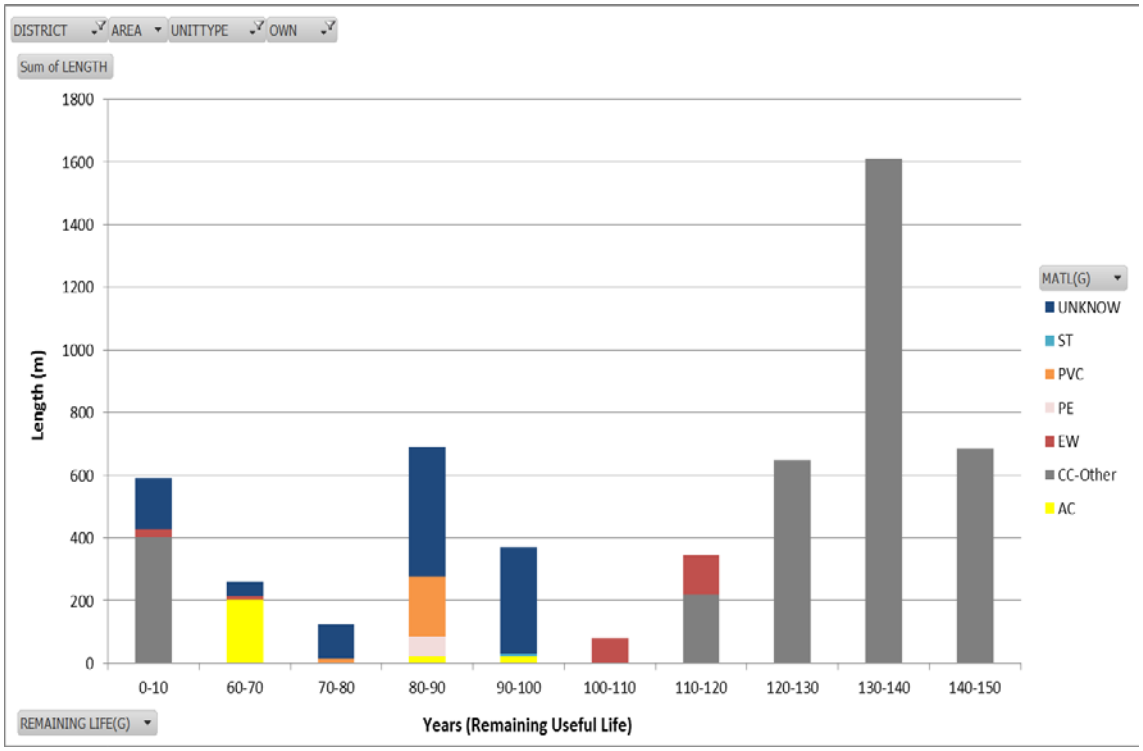

Figure 13: Geraldine Stormwater Network Remaining Useful Life

Asset Performance

Reticulation network – there are some pipes required to be upgraded to provide conveyance improvement and effective treatment to the stormwater runoff prior to discharge into the receiving environment. The network is designed up to the LOS and in extreme or high-intensity rainfalls (i.e., flows of more than 50-year return period) where the water levels in the channels exceeded bank full capacity, additional drainage requirement was provided through the secondary flow paths.

The current network capacity is sufficient to meet the required LOS in this AMP period.

Detention Dams - Geraldine is presently serviced by 2 stormwater detention dams. One of the detention dams is located near Hislop Street and the other near Barker Street - both built within natural deep-cut channels upstream of Serpentine Creek. There is option to modify the detention dam outlet discharge to provide additional capacity to Serpentine Creek.

Discharge Points - There are about 28 discharge points to the Serpentine Creek and 3 discharge points to the Slaughterhouse Creek. Most of the open discharges to Serpentine Creek are collected by sumps located in carriageways. The sumps service nearby properties by collecting outflow from the rooftops, then emptying into kerb-and-channel before discharging to an outfall. A number of bubble-up connections were also set-up around the catchment, draining ponded areas and transporting runoffs to lower sections before flowing out of a discharge point.

Waihi River takes direct runoffs from short running reticulated systems along Talbot Street. These discharges are generated from approximately 84.51 hectares of catchment area

running the length of Talbot Street from Bridge Street to the north down to a block beyond Coles Street to the south.

Majority of Serpentine Creek's drainage are designed as short sump-to-outfall reticulations. For the piped sections of the creek, connections are made through junctions that admit runoffs into the stormwater mains.

Soakage Pits - Raukapuka area has point infiltration systems also referred to as inland discharges. This type of disposal is normally utilized in areas where sub-soils permit efficient absorption of runoff to avert the accumulation of stormwater in the drainage area.

Few of these inland discharge points are found in the Geraldine Township. Majority were built around the Raukapuka area because of its favourable soil conditions allowing the use of more cost-efficient infiltration process. However while the set-up proves useful in Raukapuka, inland discharge points in the Township itself are low-performing and often result in surface ponding in adjacent streets even for rainfalls within design considerations. A number of soak pits are still in service in the west of Waihi River but efficiency is below standards. No additional requirement for soak pits is indicated for areas west of Waihi River where soil properties would often be clayey and of low-permeability characteristics.

B1.4 Asset Lifecycle Management

Operations and Maintenance – refer to Part A Section A9.1

Renewals Plan

Shown below is the programmed renewal of the stormwater reticulation over the next 10 years.

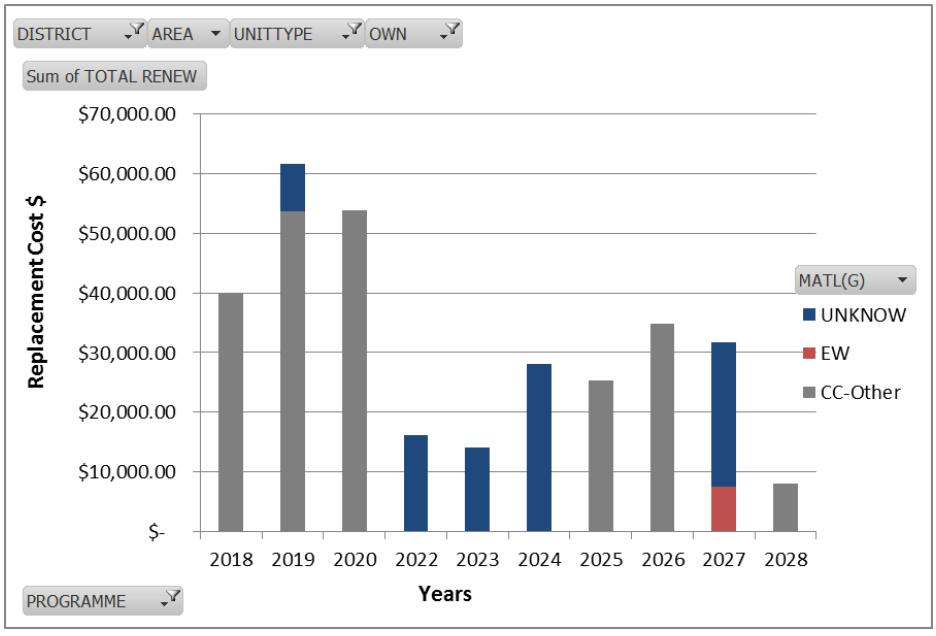

Figure 14: Geraldine Stormwater Network Renewal Programme

Asset Development

1) Geraldine Domain swale and pipe upgrade – To divert Hislop Street stormwater and convey via Geraldine Domain swale into Huffey and Talbot Street reticulation and discharge into Waihi River. The swale and pipe reticulation upgrade will

- reduce localised ponding in Hislop and Talbot Street intersection
- provide attenuation and treatment to the stormwater runoff prior to discharging into Waihi River.

Pipes identified in 2018 for renewals are part of this project to be upgraded to accept additional flows.

2) Detention dams outlet modification – To increase capacity in Serpentine Creek.

3) Serpentine Creek riparian planting programme to provide treatment to improve water quality in Serpentine Creek.

4) Media filter implementation to provide treatment around the network to provide treatment to stormwater runoff quality prior to discharge into the receiving end environment.

5) Purchase monitoring device as part of the stormwater management plan implementation action to be able to monitor the stormwater discharge quality.

B1.5 Risk Management

Refer to Part A for the general risks that apply to the stormwater systems district-wide.

In the case of Geraldine stormwater, the *Ecological Assessment Report for Waihi River and Serpentine Creek* prepared by Opus in 2013 (Document #870041) indicates that there are high metal contaminants, particularly copper and zinc, that may significantly contaminate Geraldine stormwater. This is being further investigated in the development of the Geraldine SMP.

The Geraldine SMP will set in place measures to meet the requirements of the LWRP for quality and quantity of stormwater discharging to catchments. The SMP is a requirement to obtain the discharge consent by 2018.

The deadline for stormwater discharges to meet environmental quality standards is set to 2025. There may be an associated financial risk to TDC and the communities served in terms of increased treatment costs, consequently rates/charges, if the standard is not met by the set date.

B1.6 Demand Forecasting and Management

Council's Growth Management Strategy (GMS) projects an additional population in Geraldine of 230 by 2043, raising the current 2,370 to 2,600.

The GMS also projects an increase in residential (housing) demand in Geraldine as follows:

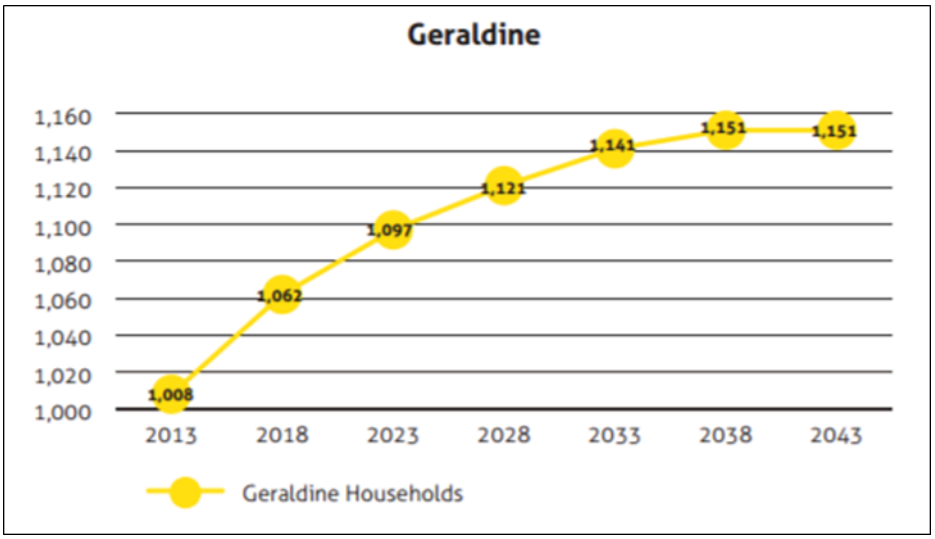

Figure 15: Geraldine Household Growth Forecast

The GMS projects some 10 hectares of industrial rezoning at Tiplady to provide for a range of industrial activities.

Any new development will need to provide attenuation, treatment and protection of secondary flowpath (if any) prior to discharging into council network.

The current level of service for the Geraldine stormwater system is designed to accommodate rainfall events up to a *one in 5-year return period* (i.e., has a 20% chance of occurring in any one year) for residential zones and *one in 10 year return period* (i.e., has a 10% chance of occurring in any one year) for industrial and commercial zones. No excessive undue ponding should result in these rain events. Details of this standard are set out in General Rule 6.5.3.3 of the Timaru District Plan (currently under review).

Runoffs from a rainfall event greater than 5-year return period will be beyond the capacity of the piped or open channel system in the Geraldine Stormwater Scheme, and some temporary surface flooding may occur.

B1.7 SUMMARY OF ISSUES

1 Increase in impervious areas and higher intensity rainstorms are reducing the level of service in the primary stormwater systems

2 System upgrades and alternative methods needed for controlling stormwater runoff

3 Inadequate formally identified and designated secondary flow paths

4 Lack of understanding on retrofitting the catchments

5 Need to improve maintenance of soak pits

6 Stormwater treatment may be required due to poor quality of Serpentine Creek

7 Lack of awareness by the public of stormwater impacts to the environment

8 Lack of auditing and enforcement process in place for high risk contaminant industries

9 Lack of stormwater code of practice and inconsistency in guidelines to engineers and developers when designing infrastructure suited for Geraldine conditions.

10 Affordability may be a problem if levels of service are increased (e.g., treatment of stormwater prior to discharge, etc)

B1.8 FINANCIAL PLAN

Table 16: Projected Capital Expenditure – Geraldine Urban Stormwater Scheme

	Project	Category (Renewal; Level of Service; Growth)	Indicative Cost ($'000)	Year of Implementation
1	Develop SMP and apply resource consent	Level of Sevice and Growth	$50	2018
2	Geraldine model	Level of Sevice and Growth	$110	2018-2028
3	Network Renewals and Upgrades	Level of Sevice and Growth	$450	2018 - 2028
4	Geraldine Domain swale and reticulation upgrade	Level of Sevice and Growth	$370	2017-2018
5	Serpentine Creek Riparian Planting	Level of Sevice	$190	2020 – 2021
6	Geraldine Dam Outlet modification	Level of Sevice and Growth	$100	2022
7	LID assessment and analysis	Level of Sevice	$20	2018
8	Media filter and oil interceptor implementation	Level of Sevice	$1,625	2018-2028
9	Education	Level of Service	$20	2020-2021

B2 TEMUKA STORMWATER SCHEME

B2.1 SCHEME OVERVIEW

The Temuka Stormwater Scheme covers an approximate area of 630 hectares (see overview map in Figure 16).

Temuka stormwater is drained 3 ways through:

- discharge via drain or creek to Temuka river
- direct discharge to Taumatakahu stream
- Inland discharge

There are no resource consents within the Temuka scheme.

Stormwater discharges in the Temuka Scheme are partially treated. Once a resource consent is obtained, in line with the requirements of the Land and Water Regional Plan, the conditions for treatment of stormwater prior to discharge will be known.

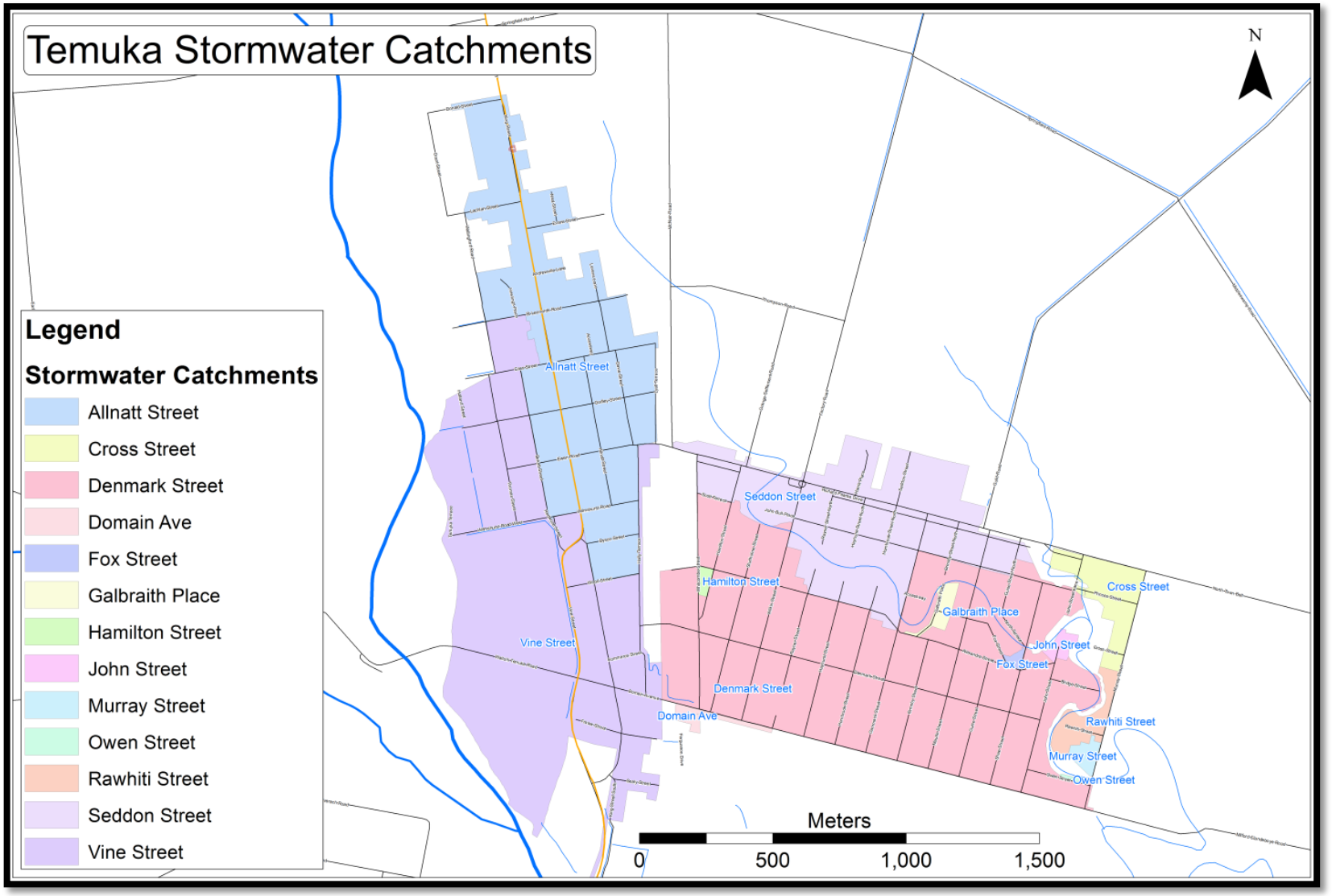

Figure 16: Temuka Catchments Overview

B2.2 Asset Summary

The Temuka Stormwater Scheme consists of:

- 14.5 km piped network and 24 km open channels
- 118 manholes and 41 soakpits

Table 17: Temuka Stormwater Network Profile

Type of Pipe Material	Sum of LENGTH
AC	83
CC	1056
CC-Other	6395
EW	435
PE	37
PVC	1618
ST	218
UNKNOWN	4701
Grand Total	**14542**

B2.3 Asset Condition and Performance

The age profile of the network is shown in Figure 17.

The Temuka stormwater network is currently assessed as being generally in good condition, based mainly from the record of pipe maintenance history, which showed as being minimal to nil over the last 10 years.

The open channels, manholes and soakage pits are, likewise, assessed as currently being in good condition based on visual inspections carried out routinely during wet weather events when the functionality of the assets can be best observed. For those that are not performing ineffective will be identified in the maintenance programme to increase the frequency to clean and monitored to determine whether replacement is required.

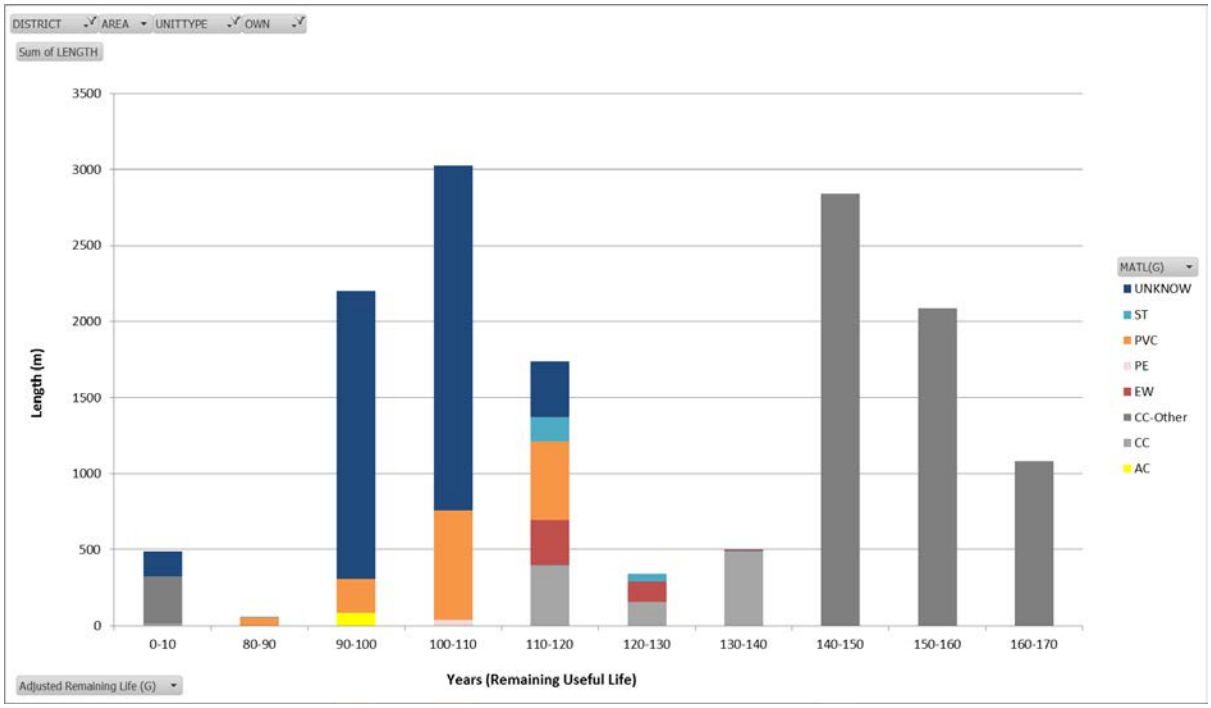

Figure 17: Temuka Stormwater Network Remaining Useful Life Material

Reticulation network – there were no significant network overflows during rain events in the past 3 years due to asset incapacity. In extreme or high-intensity rainfalls (i.e., flows of more than 50-year return period) where the water levels in the channels exceeded bank full capacity, additional drainage requirement was provided through the secondary flow paths.

The current piped network capacity is sufficient to meet the required LOS in this AMP period.

However there are low lying areas in Temuka will have localised ponding in the road as a result of stormwater runoff not able to go anywhere other than ground soakage where it could be limited if the ground water is high or the ground is saturated with water.

Discharge Points - There are about 31 discharge points to the Taumatakahu Stream. Most of the open discharges to Taumatakahu Stream are collected by sumps located in carriageways. The sumps service nearby properties by collecting outflow from the rooftops then empty into kerb-and-channel before discharging to an outfall. A number of bubble-up connections were also set-up around the catchment, draining ponded areas and transporting runoffs to lower sections before flowing out of a discharge point.

Temuka River takes runoffs via a creek/drain at King Street South.

Majority of Taumatakahu Stream drainage are designed as short sump-to-outfall reticulations. For the piped sections of the creek, connections are made through junctions that admit runoffs into the stormwater mains.

Soakage Pits – part of Taumatakahu catchment has point infiltration systems also referred to as inland discharges. This type of disposal is normally utilized in areas where sub-soils permit efficient absorption of runoff to avert the accumulation of stormwater in the drainage

area and provide more cost-efficient infiltration process. The set-up is useful but could be low-performing, often resulting in surface ponding in adjacent streets even for rainfalls within design considerations.

B2.4 Asset Life Cycle Management

Operations and Maintenance – see Part A Section A9.1

Renewals Plan

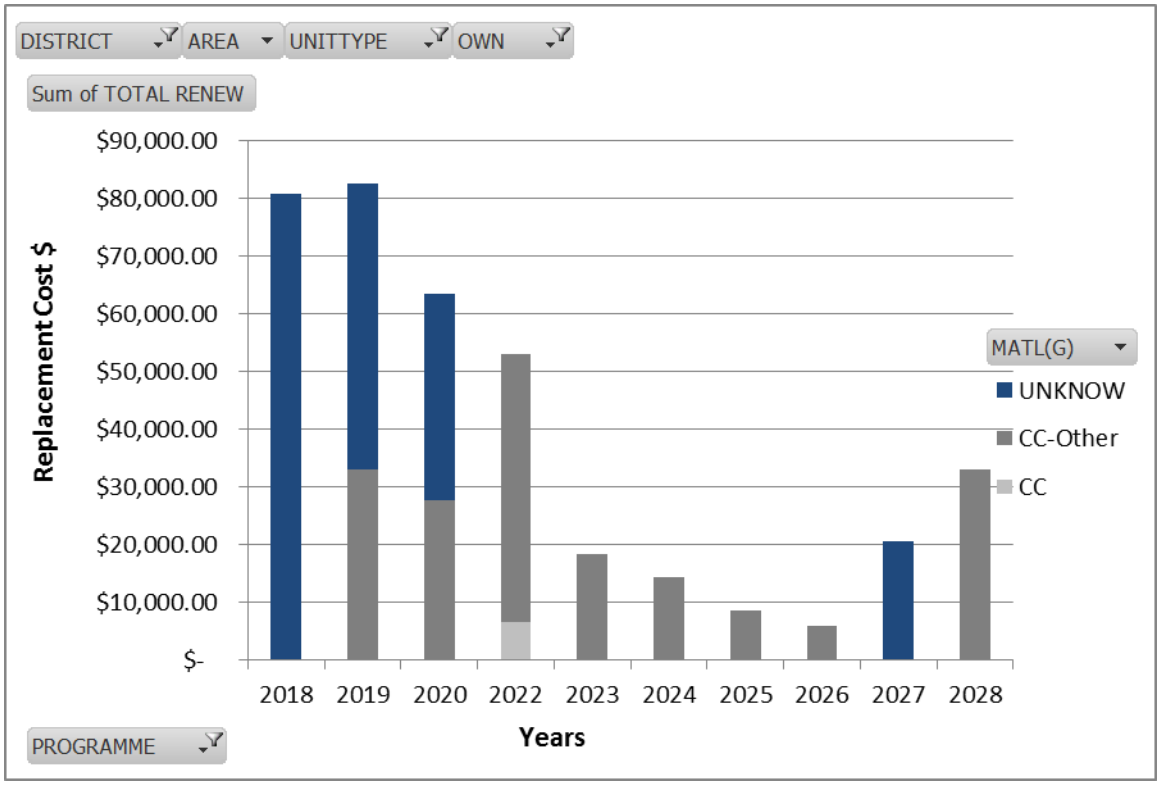

Figure 18: Temuka Stormwater Network Renewal Programme

C. Asset Development

1) Fraser Street Retention Pond – Utilising ground soakage and treatment system to minimise pipe upgrades.

2) Taumatakahu Stream riparian planting programme to provide treatment to improve water quality in Serpentine Creek.

3) Media filter implementation to provide treatment around the network to provide treatment to stormwater runoff quality prior to discharge into the receiving end environment.

4) Purchase monitoring device as part of the stormwater management plan implementation action to be able to monitor the stormwater discharge quality.

B2.5 Risk Management

Refer to Part A for the general risks that apply to the stormwater systems district-wide.

In the specific case of Temuka stormwater, the characteristically flat terrain of the town coupled with typically high groundwater table is an issue in the efficient and sustainable drainage of stormwater. Investigation of appropriate types and design of structures to deal with effective stormwater drainage is part of the development of the Temuka SMP.

The Temuka SMP will set in place measures to meet the requirements of the LWRP for quality and quantity of stormwater discharging to catchments. The SMP is a requirement to obtain the discharge consent by 2018.

The deadline for stormwater discharges to meet environmental quality standards is set to 2025. There may be an associated financial risk to TDC and the communities served in terms of increased treatment costs, consequently rates/charges, if the standard is not met by the set date.

B2.6 Demand Forecasting and Management

TDC's draft Growth Management Strategy (GMS) projects an increase in the number of households in Temuka which will peak from the current number of 1,777 to 1,943 in 2038, thereafter declining to 1,925 by 2043 (see figure below).

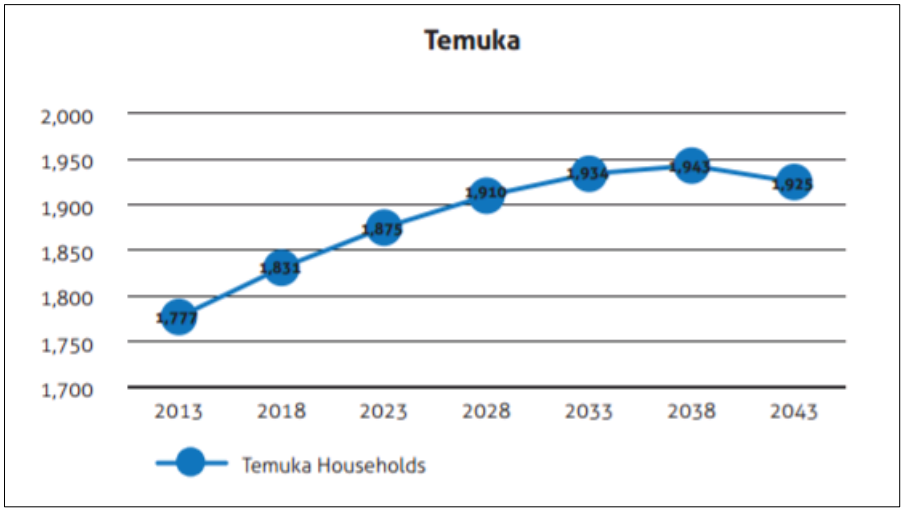

Figure 19: Temuka Household Growth Forecast

Specific projections in the GMS include the following:

- Residential growth will be focused to existing urban and deferred areas. No additional residential land is required.
- Infill opportunities will be promoted around the Temuka Town Centre, and through minor dwellings.

- Peripheral rural residential supply options to be provided north of Richard Pearse Drive.
- On business directions, greenfield industrial land is not identified given –
    - Proximity to Washdyke and Clandeboye; and the
    - Ability to intensify existing Industrial Light zoned land in Temuka such as to the west of Vine and Redwood Streets, to provide industrial employment and access to industrial goods and services. Additional commercial land is not required.

Any new development will need to provide attenuation, treatment and protection of secondary flowpath (if any) prior to discharging into council network.

The current level of service for the Temuka stormwater system is designed to accommodate rainfall events up to a one in 5 year return period (i.e., has a 20% chance of occurring in any one year) for residential zones and one in 10 year return period (i.e., has a 10% chance of occurring in any one year) for industrial and commercial zones. No excessive undue ponding should result in these rain events. Details of this standard are set out in General Rule 6.5.3.3 of the Timaru District Plan (currently under review).

Runoffs from a rainfall event greater than 5-year return period will be beyond the capacity of the piped or open channel system in the Temuka Stormwater Scheme, and some temporary surface flooding may occur.

B2.7 SUMMARY OF ISSUES

1 Increase in impervious areas and higher intensity rainstorms are reducing the level of service in the primary stormwater systems

2 System upgrades and alternative methods needed for controlling stormwater runoff

3 Inadequate formally identified and designated secondary flow paths

4 Retrofitting the catchments

5 Need to improve maintenance of soak pits

6 Affordability may be a problem if levels of service are increased (e.g., treatment of stormwater prior to discharge, etc)

7 Stormwater treatment may be required due to poor quality of Taumatakahu Stream

B2.8 FINANCIAL PLAN

Table 18: Projected Capital Expenditure – Temuka Urban Stormwater Scheme

	Project	Category (Renewal; Level of Service; Growth)	Indicative Cost ($'000)	Year of Implementation
1	Develop SMP and apply resource consent	Level of Sevice and Growth	$150	2018-2020
2	Temuka model	Level of Sevice and Growth	$120	2018-2028
3	Network Renewals and Upgrades	Level of Sevice and Growth	$625	2018 - 2028
4	Fraser Street Retention pond installation	Level of Sevice and Growth	$228	2017
5	Taumatakahu Stream Riparian Planting	Level of Sevice	$100	2021 – 2022
6	LID assessment and analysis	Level of Sevice	$20	2018-2019
7	Media filter and oil interceptor implementation	Level of Sevice	$1,295	2018-2028
8	Education	Level of Service	$20	2020-2021

B3 TIMARU STORMWATER SCHEME

B3.1 SCHEME OVERVIEW

The Timaru Stormwater Scheme covers an approximate area of 2,500 hectares (see overview map in Figure 20).

All stormwater is piped into surface water bodies. There are about sixteen coastal discharge points and many other stormwater discharge points into Saltwater Creek, North Branch of the Otipua Creek, and the Waimataitai, Taitarakihi and Washdyke Creeks. These creeks are all typically low-flow type water bodies with poor riparian vegetation, and most also have a large rural land use component within their catchments.

Resource consents in the Timaru scheme cover the following:

- CRC091500 – to undertake works within the Riparian Margin
- CRC091510 – to undertake works within the bed of a waterway
- CRC091514 – to dam water

All three consents will expire in June 2044.

- CRC168825 – to discharge stormwater from Gleniti Residential Zone 6. Consent will expire 02 July 2043.

Stormwater discharges in the Timaru Scheme have minimum treatment. Once resource consent is obtained, in line with the requirements of the Land and Water Regional Plan, the conditions for treatment of stormwater prior to discharge will be known.

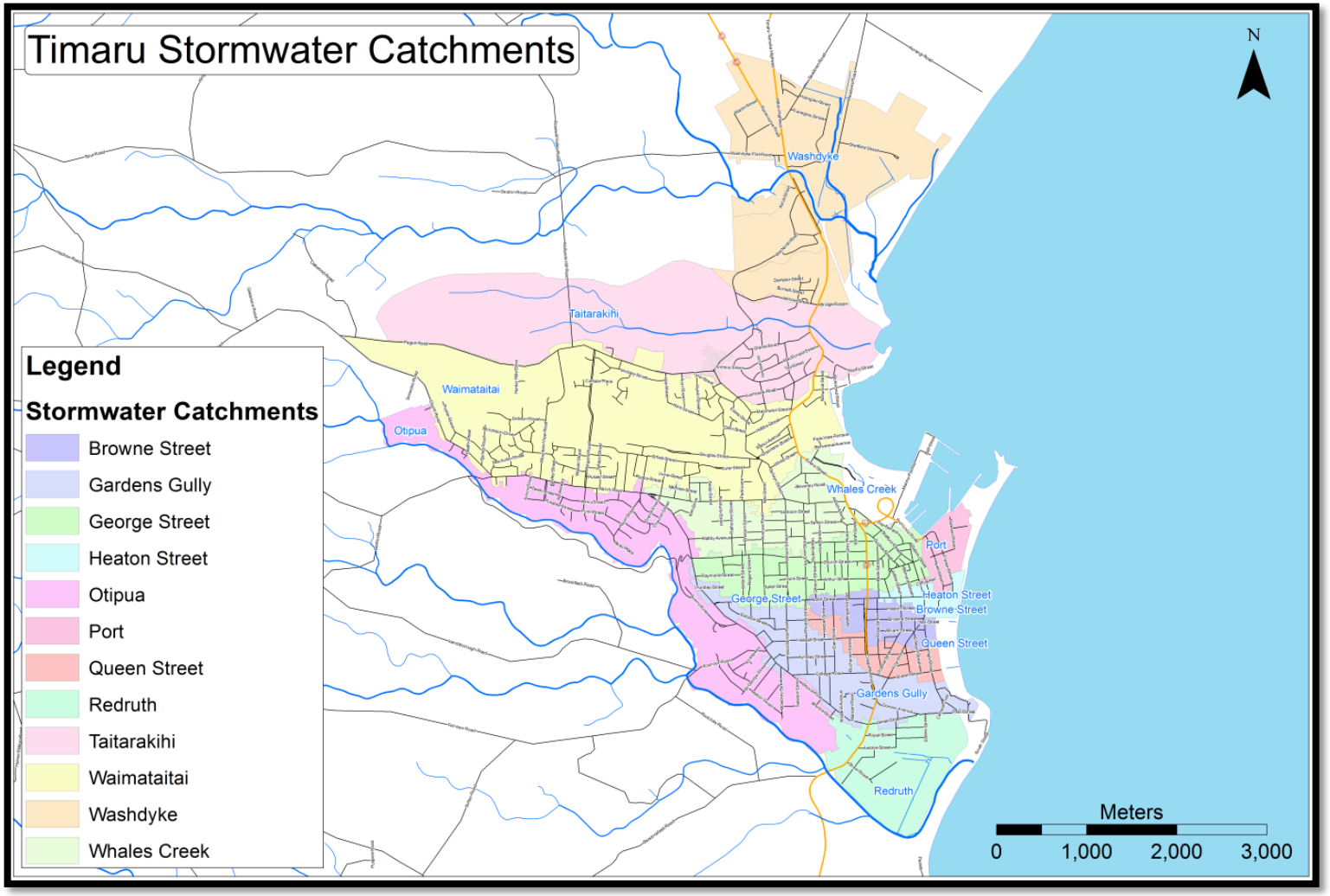

Figure 20: Timaru Stormwater Catchments Overview

B3.2 Asset Summary

The Timaru Stormwater Scheme consists of:

- 123 km piped network and 8 km open channels
- 2,343 manholes
- 2 detention dams
- 2 pump stations (Redruth and Washdyke)

Table below summarises the profile of the network.

Table 19: Timaru Stormwater Network Profile

Pipe Material Type	Sum of Length
AC	4481
BK	59
CC	1264
CC-Other	80070
COIL	21
EW	5596
PE	767
PVC	8671
SN	141
ST	50
VC	133
UNKNOWN	21240
Grand Total	**122495**

B3.3 Asset Condition and Performance

The age profile of the network is shown in Figure 21.

The Timaru stormwater network is currently assessed as being generally in moderate condition, inferred mainly from the record of pipe maintenance history, which showed as being minimal to moderate repair over the last 10 years.

The open channels and manholes are, likewise, assessed as currently being in good condition based on visual inspections carried out routinely during wet weather events when the functionality of the assets can be best observed.

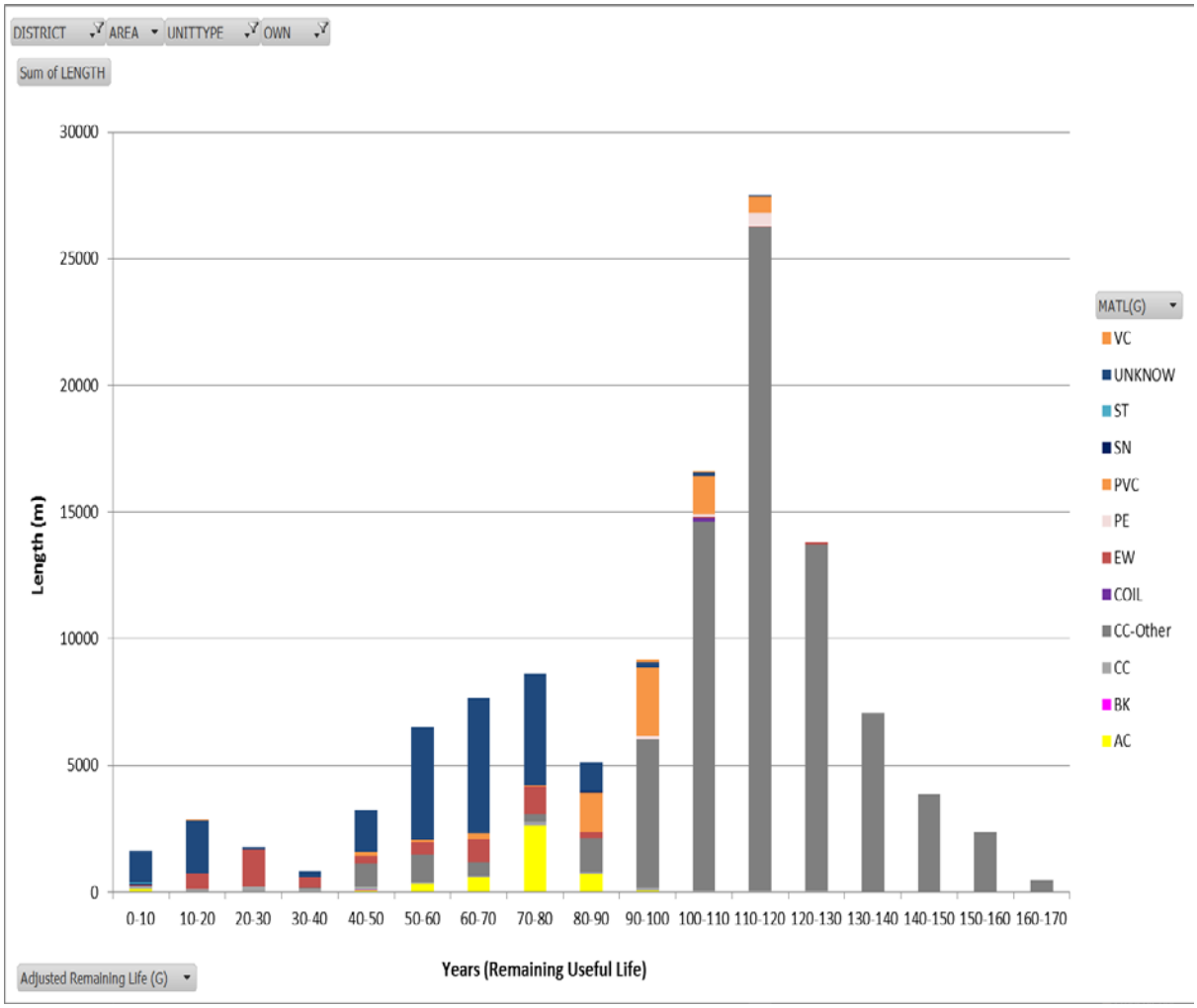

Figure 21: Timaru Stormwater Network Remaining Useful Life

Reticulation network – there were network overflows during rain events in the past 3 years due to external factors (e.g., tree roots, leaves, debris in the pipe) that greatly reduced the capacity and performance of the network. It is identified that the intensification of urban activities have increased impervious areas which, consequently, increased stormwater runoff into the network which may not be able to deliver the peak flow of the LOS rain event.

Discharge Points

Saltwater Creek (Otipua and Redruth Catchment) – there are 9 direct discharge points to the creek via pipe reticulation, and 8 indirect discharge points from piped reticulation via natural overland flowpath to the creek.

Washdyke Creek (Washdyke Catchment) – there are 5 direct discharges to the creek via pipe reticulation and 3 indirect discharge points from the piped reticulation via natural overland flowpath to the creek.

Taitarakihi Creek (Taitarakihi Catchment) – there are 17 direct discharge points to the creek via piped reticulation.

Waimataitai Creek (Waimataitai Catchment) – There are 17 direct discharge points to the creek via piped reticulation and 1 indirect discharge point from the piped reticulation via natural overland flowpath to the creek.

Whales Creek(Whales Creek Catchment) – there are 3 direct discharge points to the creek via piped reticulation.

Coastal Discharge (George, Port, Heaton, Browne, Queens and Gardens Gully Catchment) –there are 18 direct discharge points to the coast via piped reticulation and some short sump-to-outfall reticulation which is at the port area to drain road runoff into the coast.

Pumps – Washdyke Pump Station and Redruth Pump Station had been identified in report #556938 to be renewed within this AMP.

B3.4 Asset Lifecycle Management

A. Operations and Maintenance

The pump stations are visited, cleaned and checked weekly.

CCTV is used to inspect the pipes to provide information for condition assessment of the pipes.

Gleniti Bunds and swale are inspected yearly or after a big rain event to ensure the structural and performance of the bund is has not been compromised.

B. Renewals Planning

Washdyke and Redruth pump stations will be required to be renewed and upgrade within this AMP. It has been reported in the Timaru Pump Station Condition Assessment report (#556938). Both pump stations has very high operational importance that in the stormwater events failure of this pump station will results in property and economic damage due to surface flooding.

Table 20: Timaru Stormwater Pumps Renewal

Pump Station	Expected Replacement Date	Replacement Cost
Washdyke Pump Station	2019	$ 800,000
Redruth Pump Station	2020	$ 500,000

Network renewals over the next 10 years are programmed as shown in Figure 22.

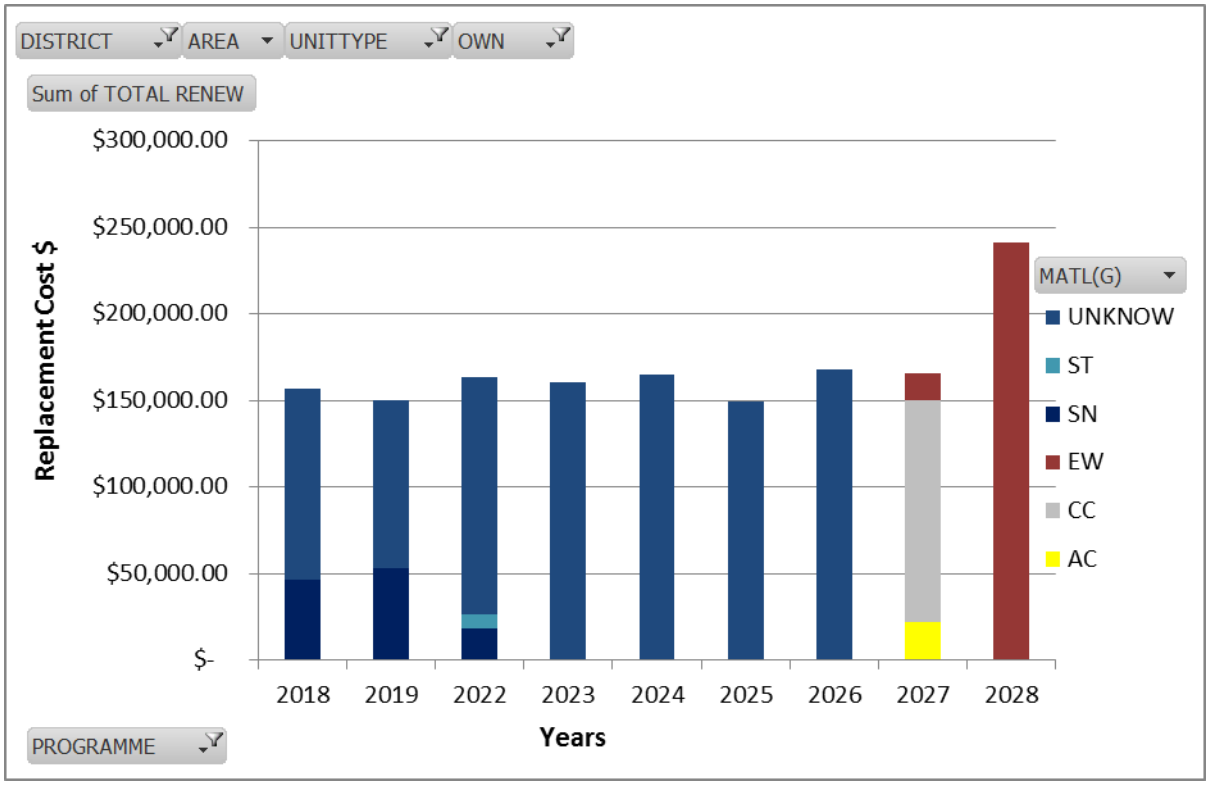

Figure 22: Timaru Network Capital Work Programme

C. Asset Development

- Riparian Planting
- Media filter implementation
- Taitarakihi Flood mitigation
- Caroline Bay Flooding mitigation
- Washdyke Flat Road Bund
- Gleniti Bunds Construction
- Stormwater retention basins (Rhodes and Lough?)
- Flow Monitoring Implementation
- Stormwater retention basins (Rhodes and Lough?)
- Brough Gully Stormwater network and infrastructure
- Washdyke Industrial expansion zone stormwater network and infrastructure

B3.5 Risk Management

Refer to Part A for the general risks that apply to the stormwater systems district-wide.

In the specific case of Timaru stormwater quality, there may potentially be significant risks from:

- possible leachates/seepages from industrial sites and the landfill

- contaminants from the transport sector and industrial sites

These risks will be further investigated and addressed in the development of the Timaru SMP. The SMP will set in place measures to meet the requirements of the LWRP for quality and quantity of stormwater discharging to catchments.

The deadline for stormwater discharges to meet environmental quality standards is set to 2025. There may be an associated financial risk to TDC and the communities served in terms of increased treatment costs, consequently rates/charges, if the standard is not met by the set date.

B3.6 Demand Forecasting and Management

TDC's draft Growth management Strategy projects the following growth directions for Timaru township:

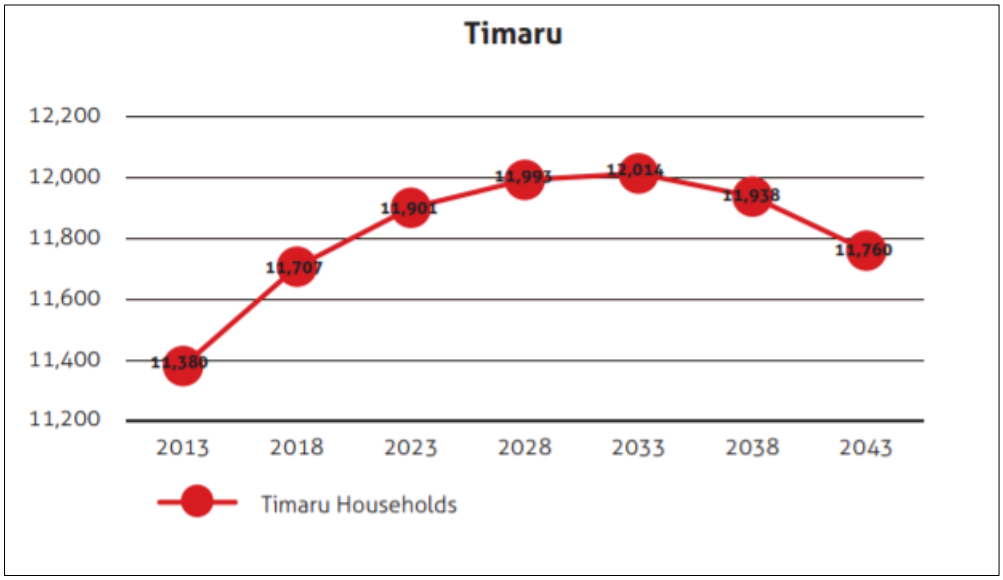

Figure 23: Timaru Household Growth Forecast

- As shown in Figure 23, household demand peaks at 2033 for an additional 760 households (inclusive of a 20% buffer)
- Residential growth is focused to existing zoned (but undeveloped) urban areas and greenfield areas (capacity exists for some 667 households). Infill opportunities will be promoted around the Timaru Town Centre, and through minor dwellings (additional small scale self-contained living accommodation in addition to the main dwelling on a site). Provision is made for limited peripheral rural residential options.
- Business intensification in the Port and Washdyke Industrial areas to cater for forecast growth.
- Timaru town centre is consolidated and provides higher amenity and a wider range of services.

Any new development will need to provide attenuation, treatment and protection of secondary flowpath (if any) prior to discharging into council network.

The current level of service for the Timaru stormwater system is designed to accommodate rainfall events up to a one in 5 year return period (i.e., has a 20% chance of occurring in any one year) for residential zones and one in 10 year return period (i.e., has a 10% chance of occurring in any one year) for industrial and commercial zones. No excessive undue ponding should result in these rain events. Details of this standard are set out in General Rule 6.5.3.3 of the Timaru District Plan (currently under review).

Runoffs from a rainfall event greater than 5-year return period will be beyond the capacity of the piped or open channel system in the Timaru Stormwater Scheme, and some temporary surface flooding may occur.

See Part A Section 5.4 for discussion of district-wide stormwater services demand drivers and demand management approaches.

B3.7 SUMMARY OF ISSUES

1 Increase in impervious areas and higher intensity rainstorms are reducing the level of service in the primary stormwater systems.

2 System upgrades and alternative methods needed for controlling stormwater runoff.

3 Inadequate formally identified and designated secondary flow paths.

4 Lack of understanding to retrofit the catchments.

5 Lack of green space in Timaru (e.g: CBD and Washdyke Industries) to accommodate stormwater attenuation and treatment and will lead to higher cost to install and maintain stormwater proprietary devices in the network.

6 Lack of awareness by the public of stormwater impacts to the environment.

7 Lack of auditing and enforcement process in place for high risk contaminant industries.

8 Lack of stormwater code of practice and inconsistency in guidelines to engineers and developers when designing infrastructure suited for Timaru conditions.

9 Discharging into very high sensitive environment (Washdyke Lagoon) will have very high compliance requirement.

10 Affordability may be a problem if levels of service are increased (e.g., treatment of stormwater prior to discharge, etc).

B3.8 FINANCIAL PLAN

Table 21: Projected Capital Expenditure - Timaru Urban Stormwater Scheme

	Project	Category (Renewal; Level of Service; Growth)	Indicative Cost ($'000)	Year of Implementation
1	Develop SMP and apply resource consent	Level of Sevice and Growth	$700	2018-2020
2	Timaru model	Level of Sevice and Growth	$590	2018-2028
3	Network Renewals and Upgrades	Level of Sevice and Growth	$1,600	2018 - 2028
4	Stormwater Reticuilation Extension	Growth	$400	2018-2028
5	Washdyke Pump Station Upgrade	Renewal	$550	2018
6	Washdyke Flat Road Pond	Level of Sevice	$400	2018-2019
7	Taitarakihi Creek Flood Mitigation – Stage 1 Option	Level of Service	$100	2018
8	Gleniti bund Construction	Level of Service, Growrh	$170	2022 and 2028
9	Riparian Planting	Level of Service	$200	2023-2024
10	Seadown Number 1 Drain Upgrade	Level of Service, Growth	$200	2018
11	LID assessment and analysis	Level of Sevice	$45	2018-2019
12	Media filter and oil interceptor implementation	Level of Sevice	$4,600	2018-2028
13	Education	Level of Service	$30	2019-2021

B4 PLEASANT POINT STORMWATER SCHEME

B4.1 SCHEME OVERVIEW

The stormwater scheme covers an area of approximately 290 hectares (see overview map in Figure 24).

The scheme mainly utilizes land drainage. Some pipe reticulation are provided in Winchester, Cave, Milford-Ohapi and Pareora.

Stormwater collected is disposed into soakage holes. Stormwater west of Kyber Street and Halstead Road from the reticulated network is disposed into the Pleasant Point Stream. The remainder of stormwater drainage, mainly open channels with culverts, discharges into German Creek. Stormwater runoff from the Stratheona Huts is discharged to ground soakage pits.

There are currently 3 resource consents in the Pleasant Point Scheme that allows for the following:

- CRC972361 – to construct an embankment dam
- CRC972362 – to dam and divert water for flood relief purposes
- CRC980793 – to discharge floodwaters to a tributary of German Creek

All three consents will expire in December 2032.

Once a new resource consent is obtained in line with the requirements of the Land and Water Regional Plan, the conditions for treatment of stormwater prior to discharge will be known.

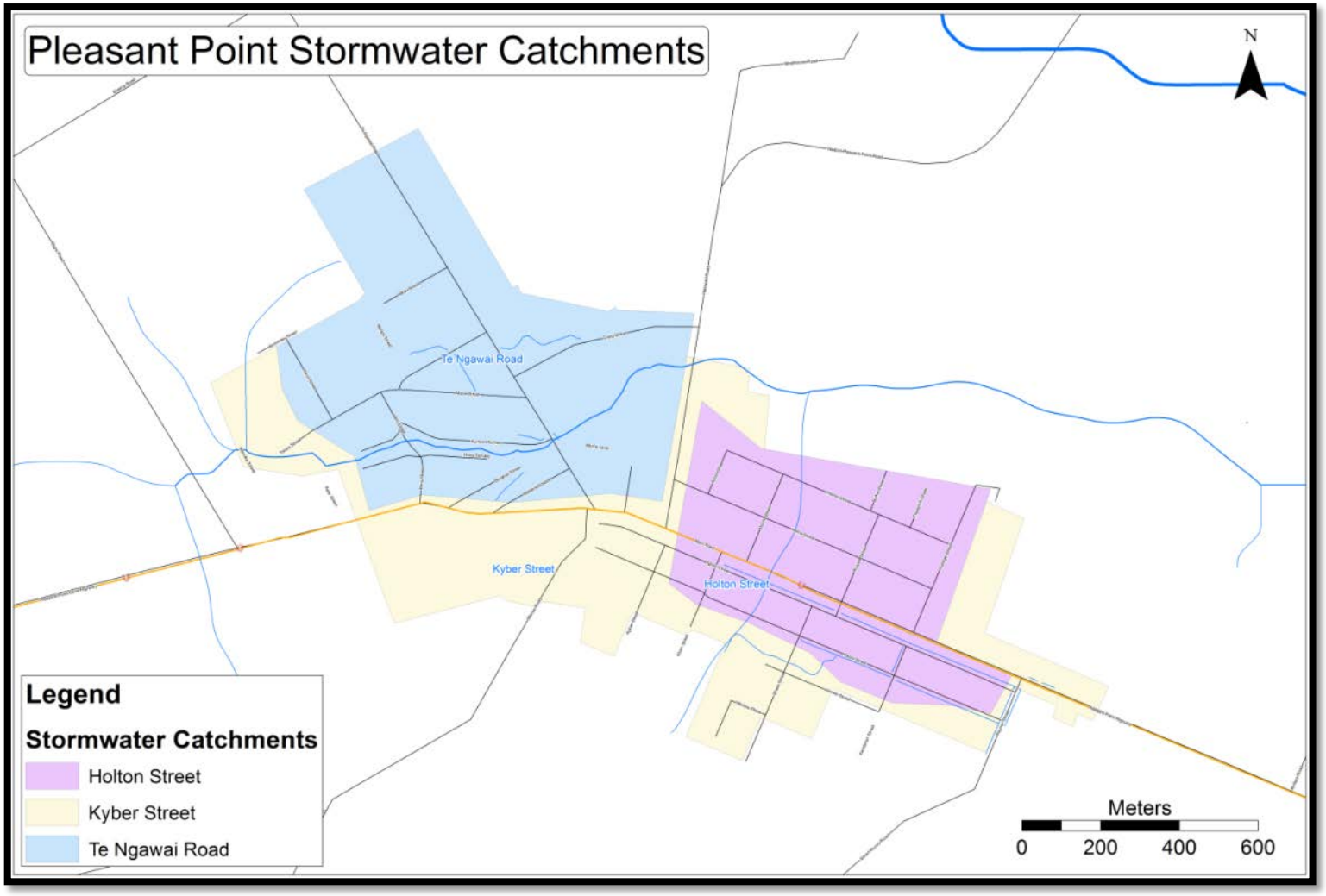

Figure 24 : Pleasant Point Stormwater Scheme Overview

B4.2 Asset Summary

The Pleasant Point Stormwater Scheme consists of:

- 2.0 km piped network and 3.0 km open channels
- 18 manholes and 73 soakpits
- 1 detention dam

Winchester has around 937 meters piped stormwater drainage, 3.0km open channel and 8 soakpits while Pareora has some 254 meters of piped stormwater drainage and 2 soakpits.

Table 22: Pleasant Point Stormwater Network Profile

Type of Pipe Material	Sum of LENGTH
CC	98
CC-Other	1618
PVC	189
ST	37
UNKNOWN	61
Grand Total	**2004**

B4.3 Asset Condition and Performance

The age profile of the network is shown in Figure 25.

The stormwater network is currently assessed as being generally in good condition, inferred mainly from the record of pipe maintenance history, which showed as being minimal to nil over the last 10 years.

The open channels, manholes and soakage pits are, likewise, assessed as currently being in good condition based on visual inspections carried out routinely during wet weather events when the functionality of the assets can be best observed.

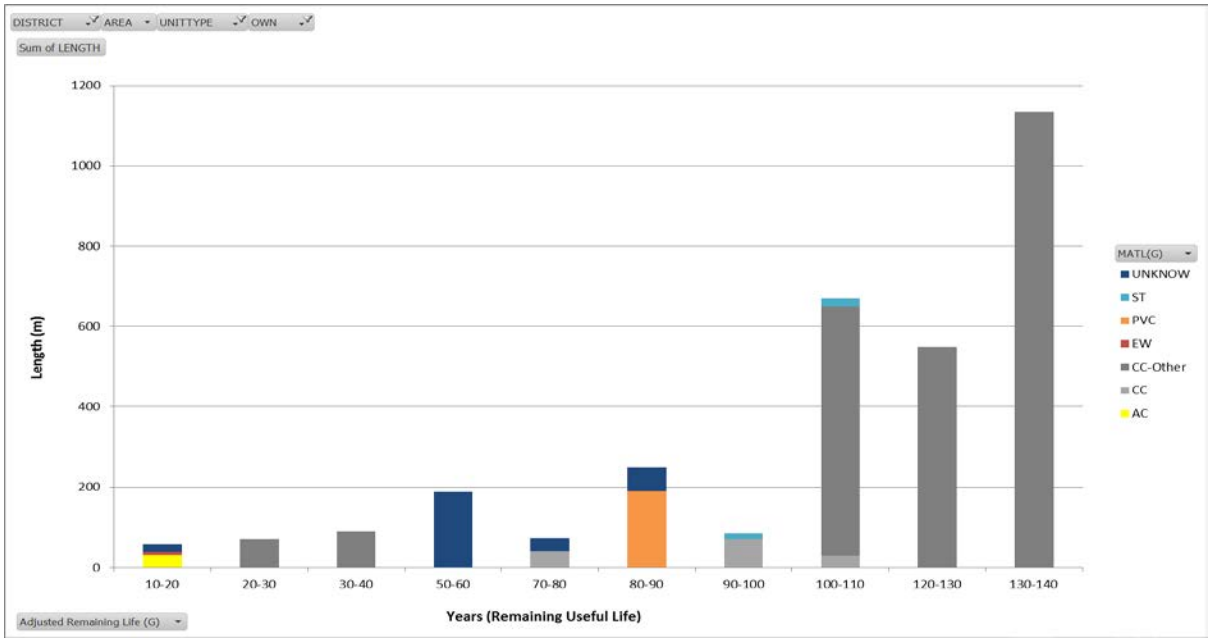

Figure 25: Rural Pleasant Point Stormwater Mains Network Remaining Useful Life

Reticulation network – there were no significant network overflows due to asset incapacity during rain events in the past 3 years. In extreme or high-intensity rainfalls (i.e., flows of more than 50-year return period) where the water levels in the channels exceeded bank full capacity, additional drainage was provided through the secondary flow paths.

The current piped network capacity is sufficient to meet the required LOS in this AMP period.

Detention Dams – Pleasant Point is presently serviced by one stormwater detention dam located between Manse Road and Smart Munro Road.

Discharge Points – there are 6 direct discharge points to the Pleasant Point Stream via stormwater reticulation. South-East of Pleasant Point catchment is discharging into German Creek via open channel south-side of Pleasant Point Highway.

Milford-Ohapi has one indirect discharge point to Orakipaoa Creek and Taumatakahu Stream via open channel.

There are no discharge points in Cave and Pareora.

There are 3 direct discharge points in Winchester to Dobie Stream via stormwater reticulation.

Soakage Pits – Pleasant Point, Winchester and Pareora areas have point infiltration systems also referred to as inland discharges. This type of disposal is normally utilized in areas where sub-soils permit efficient absorption of runoff to avert the accumulation of stormwater in the drainage area.

B4.4 Asset Life Cycle Management

Operations and Maintenance - see Part A Section A9.1

Renewals Plan –

Below is the projected programme for renewal of soakpits in Pleasant Point over the next 10 years.

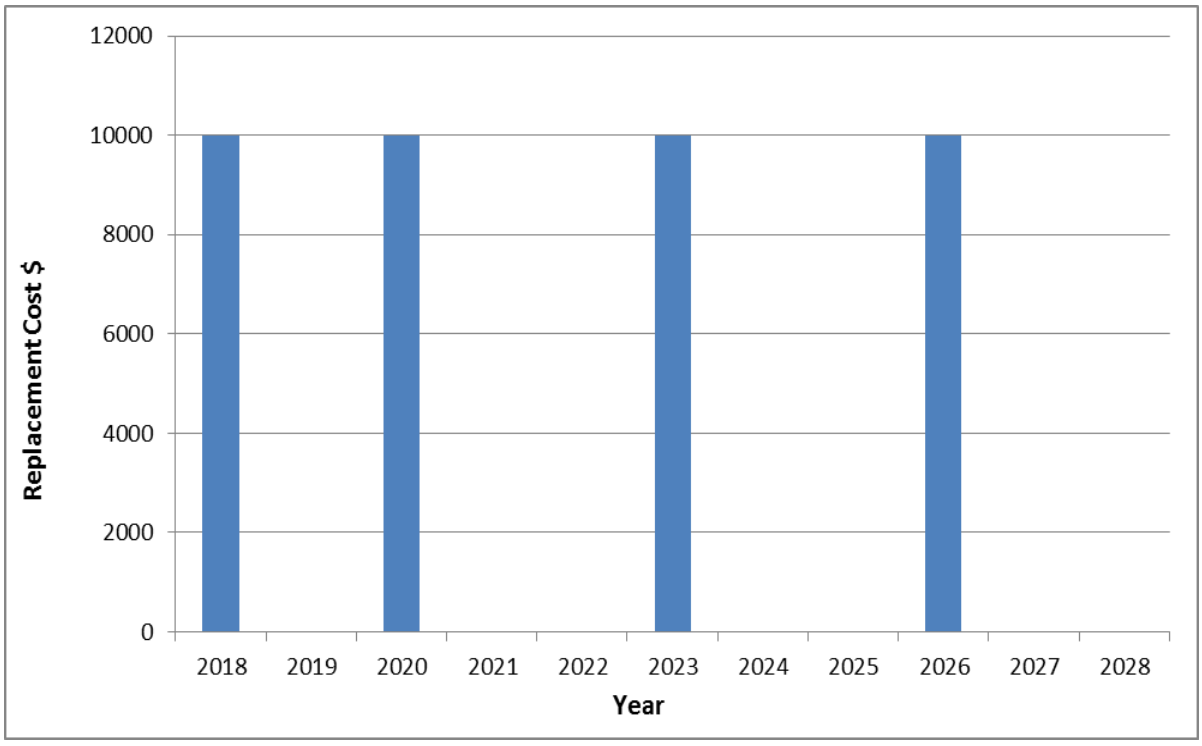

Figure 26: Pleasant Point Soakpit Renewal Programme

Asset Development

The following are programmed:

- German Creek Riparian Planting
- Pleasant Point Stream Riparian Planting

B4.4 Risk Management

The Pleasant Point Stormwater Management Plan (SMP) will set in place measures to meet the requirements of the LWRP for quality and quantity of stormwater discharging to catchments.

The deadline for stormwater discharges to meet environmental quality standards is set to 2025. There may be an associated financial risk to TDC and the communities served in terms of increased treatment costs if the standard is not met by the set date.

B4.6 Demand Forecasting and Management

- Growth directions from the Council's *Draft Growth Management Strategy (GMS)*:

    - The projected increase in residential (housing) demand in Pleasant Point is as follows:

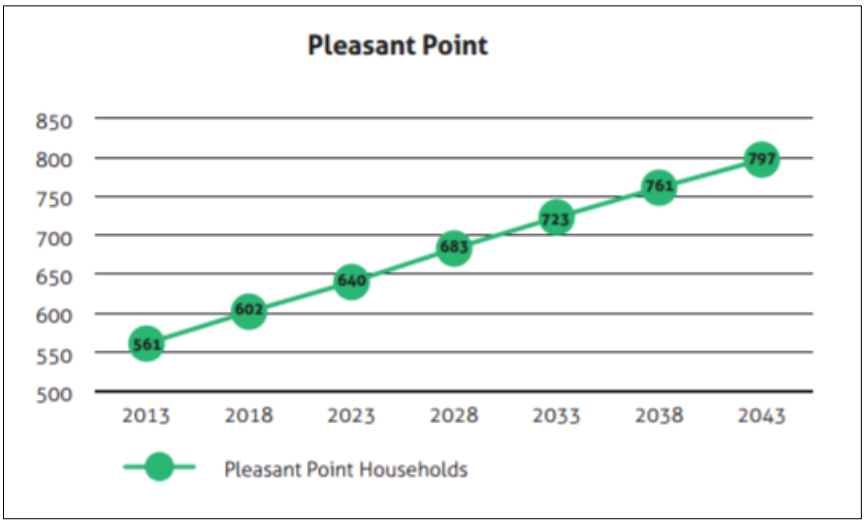

Figure 27: Pleasant Point Household Growth Forecast

    - Rural residential opportunities by Manse Road to be promoted to the South
    - Existing town centre and industrial zones to be intensified to improve productivity

Any new development will need to provide attenuation, treatment and protection of secondary flowpath (if any) prior to discharging into council network.

The current level of service for the rural stormwater system is designed to accommodate rainfall events up to a one in 5 year return period (i.e., has a 20% chance of occurring in any one year) for residential zones and one in 10 year return period (i.e., has a 10% chance of occurring in any one year) for industrial and commercial zones. No excessive undue ponding should result in these rain events. Details of this standard are set out in General Rule 6.5.3.3 of the Timaru District Plan (currently under review).

Runoffs from a rainfall event greater than 5-year return period will be beyond the capacity of the piped or open channel system in the rural network, and some temporary surface flooding may occur.

See Part A Section 5.4 for discussion of district-wide stormwater demand drivers and demand management approaches.

B4.7 SUMMARY OF ISSUES

1 Increase in impervious areas and higher intensity rainstorms are reducing the level of service in the primary stormwater systems.

2 System upgrades and alternative methods needed for controlling stormwater runoff.

3 Inadequate formally identified and designated secondary flow paths.

4 Lack of understanding to retrofit the catchments.

5 Lack of maintenance of soak pits

6 Lack of stormwater impacts to the environment awareness by the public.

7 Lack of stormwater code of practice and inconsistency guidelines to engineers and developers when designing infrastructure suite for Timaru conditions.

8 Affordability may be a problem if levels of service are increased (e.g., treatment of stormwater prior to discharge, etc).

9 Stormwater treatment may be required due to poor quality of Pleasant Point Stream

B4.8 FINANCIAL PLAN

Table 23: Projected Capital Expenditure – Pleasant Point Stormwater Scheme

	Project	Category (Renewal; Level of Service; Growth)	Indicative Cost ($'000)	Year of Implementation
1	Develop SMP and apply resource consent	Level of Service and Growth	$100	2018-2020
2	Pleasant Point model	Level of Service and Growth	$25	2018-2028
3	Network Renewals and Upgrades	Level of Service and Growth	$40	2018 - 2028
4	LID assessment and analysis	Level of Service	$22	2019-2020
5	Media filter and oil interceptor implementation	Level of Service	$435	2018-2028
6	Education	Level of Service	$17	2020-2021

APPENDICES