

Water Supply Activity Management Plan

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1. Introduction

Activity Management Plans are a key component of Council's planning process. They are prepared within the context and framework of the Long Term Plan (LTP), District Plan, Annual Plan and Funding Policy.

The purpose of this activity management plan (AMP) is to outline and summarise the council's asset management approach for the provision and intergenerational management of water supply services.

The Council's water supply activity currently includes the management of two reticulated schemes in the Grey District which source, treat and distribute water. These schemes are:

- Wider Greymouth - Greymouth, Cobden, Blaketown, Boddytown, Karoro, South Beach, Paroa, Taylorville, Dobson, and Stillwater. Planning is underway to connect Kaiata and Kaiata Park to the Greymouth supply, which is scheduled for completion by June 2021.
- Runanga/Dunollie/Rapahoe – currently fed from Greymouth *
- Blackball

* Note: While the Runanga water supply has been upgraded, it has not been commissioned and that community is currently connected to the Greymouth water supply. A decision to proceed has been deferred pending the outcome of the Three Waters reform.

The Government is presently working through a programme of reform for three waters (water supply, wastewater and stormwater) service delivery arrangements. The reforms will be a significant area of focus for the Council in the initial period of the LTP. From 2022 onwards there is likely to be a new regional entity responsible for delivering water supply services in the Grey District and wider region. While the outcome of this reform is not yet known, indications are there will be an ongoing role for Council in collective ownership in relation to the regional entity but we will potentially no longer be involved in planning and delivery.

However, the form of any new arrangements is not known at present. Until this is further developed, for planning purposes the Council is assuming that it will deliver these services over the life of the LTP, acknowledging that this assumption has a high degree of uncertainty. We note that our community will need these services whether they are delivered by the Council or not, and continued planning for these services is therefore reflected in this AMP.

Acknowledging the upcoming changes and the context of the reform, the purpose of this plan is to outline:

- The services provided now and in the future, as far as they are known at the time of writing;
- The linkages between agreed community outcomes and levels of service;
- Acquisition, operation, maintenance, renewal and disposal of assets;
- Assessment and mitigation of risk;
- Funding of services; and
- Proactive knowledge improvement.

The Council's vision for the District is: ***Thriving, Connected and Resilient Grey District***. This AMP outlines Council's approach for the delivery of water supply services as part of achieving this vision and in the context of the upcoming reform. It describes the strategies and work programmes for this activity, and outlines how Council intends to meet the objective of delivering the required level of service to our users in an efficient and cost effective way.

This plan is intended to be read in conjunction with the Long Term Plan and fulfils requirements of the Local Government Act 2002 - schedule 10.

2. Activity Description

2.1 What we do

Our Water Supply Networks

The Council's water supply activity includes the management of two reticulated schemes in the Grey District which source, treat and distribute water. These schemes are Blackball and the wider Greymouth area. They operate as individual water supplies but are managed and funded via a single budget.

Note: While the Runanga water supply has been upgraded, it has not been commissioned and that community is currently connected to the Greymouth water supply. A decision to proceed has been deferred pending the outcome of the Three Waters reform.

We deliver in excess of 2.6 billion litres of water a year to businesses and households in the District, with over 5,100 households and businesses connected to these schemes:

Scheme	Service Area	No. of Connections
Wider Greymouth	Greymouth, Cobden, Blaketown, Boddytown, Karoro, South Beach, Paroa, Taylorville, Dobson, Stillwater (will include Kaiata and Kaiata Park Development by June 2021, with an additional 135 properties)	4,286
Runanga*	Runanga, Dunollie, Rapahoe	650
Blackball	Blackball	204

* Currently fed from Greymouth Scheme – see further comment below.

Our infrastructure includes approximately 207.6 km of pipes, two treatment plants, nine reservoirs and 12 pump stations.

At the time of preparation of this AMP, the following additional asset activities are noted:

- While the Runanga water supply has been upgraded, it has not been commissioned. Runanga is being fed with water from the Wider Greymouth Scheme as a decision is to be made as to fund additional disinfection treatment for this scheme or continue to supply water from the Greymouth Scheme.
- The Greymouth Reservoir is being replaced and the capacity increased. The net effect will be an additional three reservoirs, once the existing Greymouth Reservoir is decommissioned.
- The total length of the pipe networks will be increased as will the number of pump stations once Kaiata Township and Kaiata Park Development is commissioned. No additional reservoir is needed for this project as the existing Kaiata Park Development reservoir will be vested with Council.

Council is responsible for the operation and maintenance of the two schemes. This work includes:

- Managing and maintaining the network so water is constantly available on demand and is delivered at an appropriate quality (colour and taste) and quantity (pressure and flow) (in part to meet firefighting requirements).
- Responding promptly to fix all faults.
- Detecting and fixing leaks, installing water meters for large commercial water users, and water meter readings.
- Planning and carrying out renewals to replace assets in a timely manner.

- Monitoring water quality to ensure it meets the required standard and is not contaminated or presenting a health risk.
- Planning to respond to emergency events that may damage the network, such as earthquakes. We often refer to this as Lifelines Planning, as lifelines are critical services that will be needed during an emergency event.
- Forward planning to ensure future demand can be met, taking into account anticipated growth and other factors such as climate change impacts.

Water sources for our drinking water include groundwater, infiltration galleries and surface water intakes. The West Coast Regional Council allocates water to us via resource consents, which set upper limits on the volume of water that can be taken from the various water sources.

Other Water Supply Systems

Privately owned water supply systems are used in rural areas and in townships without reticulated schemes. These residents obtain their water by other means – most from their own rainwater tanks, but some have private bores. There are about 70 medium to very small private reticulated supplies at various schools, community halls, camping grounds, tourism establishments and small communities. In previous years two existing private-public schemes at Nelson Creek and Ahaura have been upgraded with financial assistance from the Ministry of Health, to meet New Zealand Drinking Water Standards (NZDWS). The schemes continue to be owned, managed and maintained by Community Trusts.

This AMP does not cover such on-site individual water supply systems, or public or community schemes that are owned and operated by other individuals, businesses or trusts. Reference can be made to the Environmental Services AMP for Environmental Public Health and Building Authority regulatory responsibilities for these activities.

Goals and Objectives

The goals for the provision of water supplies in the Grey District are:

- To ensure adequate¹ potable supplies of water (by private or public means²) for all consumers.
- To ensure that adequate water supplies are available for firefighting purposes.
- To encourage the sustainable use of water as limited resource for agricultural, horticultural, commercial, industrial and domestic purposes and to discourage wastage.

Council's objectives are:

- To ensure that all public systems comply with Health Act, the Resource Management Act and consents issued under the Act as well as the NZDWS.
- To ensure all consumers have access to good quality water.
- To assess the quality and adequacy of all existing private water supply systems in the district.
- To be pro-active on the renewal of existing facilities or the provision of new schemes.
- To ensure the maintenance and renewal of public infrastructural assets in perpetuity so that there is no diminution in value and to provide for the estimated future cost of doing so.
- To undertake all physical works to a high standard, within budget, and within time.
- To maintain a sound management regime for all matters relating to water into the future.

Challenges

¹ Terms such as “adequate” are recognised as being subjective. Ultimately the Council has determined what is adequate for instance based on development of its Long Term Plans and the AMPs which recognises its statutory responsibilities and inputs it has received from the public, regulatory agencies and other stakeholders.

² Council has both a service delivery role (public supplies) and a regulatory role (private supplies) with respect to the provision of potable water.

There are a number of key current challenges (issues) associated with this activity. These include:

- Ageing infrastructure, with high leakage rates, the potential for pipe breaks and service disruption. This is an increasing concern due to the mature age of assets in communities where most of the water infrastructure exists: Cobden (average pipe age 48 years), Blaketown (average pipe age 48 years), Greymouth (average pipe age 35 years). These three areas comprise 48% of the length of the pipe network. These ages have been calculated as follows:
 - The average useful life of the assets in each community is determined by dividing the replacement value by the annual depreciation. The remaining useful life is determined by dividing the current value (depreciated replacement value) by the annual depreciation. The age of the assets in each community is therefore the useful life minus the remaining useful life.
- Vulnerability of above ground and assets to natural hazards and climate change.
- Costs associated with renewals and upgrades to address these matters. Cumulative percentage change in the price indexes for the water industry from June 2018 to June 2020 has been the highest at 5.8% across all Local Government industry sectors. This cumulative change is higher than the change over the same period for the Consumer Price Index at 3.4%. This trend is predicted to continue for the next 20 years according to BERL³.
- Ability of communities to fund the maintenance, operation, renewal and improvements for this activity in the face of the predicted decline in population, see Section 3 below.
- Legislative changes. At the time of preparation of this AMP there is the potential for 3 Waters Reform where this activity is likely not to be managed by Council. Whether the Council will still own the assets associated with this activity is unknown.

These challenges and how we will address them are covered in more detail in Sections 4 - 6 below.

Drinking Water Supply Standards

Since 2008, the Council has spent approximately \$5 million investing in upgrading schemes to comply with the NZDWS. Each year the Ministry of Health monitors and reports on the compliance of all community water supplies with these regulations, including those in the Grey District.

The table below is sourced from the Ministry's most recent Annual Report on drinking-water quality⁴. The report provides information on each water supply and whether it complied with the relevant sections of the Health Act 1956 and the relevant Standards within the *Drinking-water Standards for New Zealand 2005 (Revised 2018)*.

Grey District Water Supplies:

Blackball				Population: 280
Health Act: complied	Standards: Bacterial met	Protozoal met	Chemical met	
The water supply uses surface water and is treated by UV and chlorinated.				
Greymouth				Population: 8,320
Health Act: complied	Standards: Bacterial met	Protozoal met	Chemical not met ⁵	
The water supply uses groundwater and is treated by UV and chlorinated.				

³ BERL Forecasts of Price Level Change Adjustors – 2019 Update

⁴ Ministry of Health *Annual Report on Drinking-water Quality 2019–2020*, June 2020 (Annual Compliance Report 1 July 2019–30 June 2020)

⁵ Non-compliance with HAA in the Greymouth reticulation

Runanga⁵Population: 1,090

Health Act: **complied** Standards: Bacterial **met** Protozoal **met** Chemical **met**

The water supply uses groundwater and is treated by UV and chlorinated.

Runanga failed the bacteriological Standards for 80 people because *E. coli* was detected in 0.3 percent of monitoring samples.

Compliance for bacterial and Protozoal is measured at the treatment plants, chemical compliance is measured within the reticulation.

Recent improvements to the Runanga water supply have enabled increased compliance with the standards, with the one exception noted. Council continues to meet all requirements for record keeping and monitoring. All our water supplies have compliant Water Safety Plans approved by the Ministry of Health in place.

A potential emerging issue is an intermittent chemical non-compliance occurring in the Greymouth Scheme. This is caused by a build-up of disinfection by-products in the distribution zone (chlorine residuals).

This is caused by high concentrations of natural organic matter in the source water. Levels fluctuate and non-compliance is intermittent. At this stage the advice is to monitor to learn more about the issue in order to determine appropriate solutions. Situation may be aggravated by older-internally rougher pipes retaining build-up on the inside of the pipes. This plan signals that this matter may need to be addressed in Year 4 by including funding the next LTP.

Assessment of Water and Other Sanitary Services

With respect to water supplies, other than the increased emphasis on lifeline considerations which were not a direct consideration in the assessment of water and other sanitary services at that time, there are no significant variations from this assessment.

2.2 Why we do it

Water is a basic need and an essential service. We provide quality, affordable water and in the process contribute to:

- Our community's health
- Community safety (through water supply for firefighting)
- Industrial and residential development

Water supply is a core service we provide to the community and is important to everyone. Provision of potable water is essential for life and directly contributes to the wellbeing of residents and economic prosperity. Community-wide benefits to protect public health are provided through having safe drinking water available in areas that are serviced.

Environmentally, the water sourced for drinking water occurs within sustainable limits set by the West Coast Regional Council through their resource consents. This also protects the cultural values of water for Māori who consider water to be the essence of life that supports all people, plants and wildlife.

Under the Health Act 1956, we are obligated to improve, promote and protect public health within the district (s.23). The provision of safe and reliable water supply services, which meet applicable legislation and standards, promotes public health.

2.3 Levels of service

⁵ Runanga Water Supply complied in full as it was connected to the Greymouth Water Supply during the compliance period.

The focus over the next three years is to maintain existing levels of service taking into account projected population growth/decline and other demand factors.

In addition, this AMP recommends that Council from Year 3 onwards continue with the increased levels of funding for renewals, to reduce the backlog of deferred renewals introduced and confirmed through the 2018-28 LTP.

Current and future level of service and additional performance measures

Refer to section 5 for the table which summarises achievements with respect to recent levels of service and performance measures Council has established through consultation on annual plans and previous LTP's.

2.4 Key stakeholders

There are a number of key stakeholders relevant to the activity. These include those below:

- Residents and ratepayers
- Adjacent landowners
- The community
- Department of Internal Affairs Te Tari Taiwhenua
- Te Rūnanga O Ngāti Waewae and Te Rūnanga O Ngāi Tahu
- Ministry of Health Manatu Hauora
- Taumata Arowai Establishment Unit
- Community and Public Health (WCDHB) Te Mana Ora
- Subdivision and land developers
- Community Associations, Groups and Clubs
- Consent Authorities (principally the West Coast Regional Council and Council's Environmental Services Department)
- Department of Conservation
- Industry and Business Associations (for instance the Greymouth Business and Promotions Association).
- Individual industries and businesses with specific water supply needs
- Land Information New Zealand
- Ministry for the Environment
- Neighbouring local authorities
- Fire and Emergency New Zealand (FENZ)
- National Emergency Management Agency (Civil Defence) Te Rakau Whakamarumaruru
- Private suppliers of water to the public

2.5 Community outcomes

In achieving its vision, the Council has identified a number of community outcomes. These reflect what the community wants to achieve now and in the future. Community Outcomes allow local communities to define what they think is good for their economic, social, cultural and environmental wellbeing and are an expression of what their values are.

Our Council's Community Outcomes are as follows:

ECONOMIC:	SOCIAL:	CULTURAL:	ENVIRONMENTAL:
Strong	Safe	Proud	Bold
Diverse	Inclusive	Unique	Practical
Sustainable	Connected	Inter-connected	Resilient
Prosperous	Enabled	Vibrant	Strategic

Our water supply activities contribute to following Community Outcomes:

	ECONOMIC: Strong Diverse Sustainable Prosperous	SOCIAL: Safe Inclusive Connected Enabled	CULTURAL: Proud Unique Inter-connected Vibrant	ENVIRONMENTAL: Bold Practical Resilient Strategic
Water supply				
Water Supply	✓	✓	✓	✓

Provision of potable water is essential for life and directly contributes to the wellbeing of residents. Community-wide benefits to protect public health are provided through having safe drinking water available in areas that are serviced. It also assists with fire fighting in reticulated areas to protect public safety.

Water is necessary for maintaining provision of critical public services and facilitating economic development. Industries, businesses, our hospital and schools require water to operate. High quality and a reliable quantity of water facilitates the continued development of public, private and business interests. Reliable and future proofed water supply systems attract business to the district, and ongoing maintenance of the networks ensures minimal impact on businesses and essential services.

Environmentally, the water sourced for drinking water occurs within sustainable limits set by the West Coast Regional Council through their resource consents. This also protects the cultural values of water for Māori who consider water to be the essence of life that supports all people, plants and wildlife.

2.6 Effects on Community Wellbeing

The water supply activity can have a range of effects on the social, economic, environmental, or cultural wellbeing of the community, some of which are positive, others which can be negative. The positive effects have been outlined in section 2.2 above. Potential negative effects are identified in the tables below.

Effect	Type of effect	How Council intends to mitigate effect
Maintaining our drinking water supplies to legislated water safety requirements could impact on affordability for residents. Capital costs and subsequent operating costs could be high for drinking water supplies.	Social Economic	<p>The Council will continue to investigate options and implement appropriate measures for increasing operational efficiency of water supply services to maintain affordability of water charges. Council is also engaged in consultation with central government on the present Three Waters Review, where it will advocate for ongoing affordability of water supply services to residents. Government contributions to upgrades have been sought by the Council in order to reduce impacts on ratepayers.</p> <p>See also additional mitigation measures in the next effect in this table.</p>

Effect	Type of effect	How Council intends to mitigate effect
Water network service failure and/or adverse events (drought, floods, erosion, earthquakes) can lead to restrictions for water consumers.	Social Economic	<p>The Council will continue to investigate options regarding water sources and networks and their management and resilience. We will also use systematic identification, prioritisation and implementation of network improvements to help address this issue.</p> <p>This activity and this plan includes enhancements to water supply capacity, increased funding to identify and monitor leakage. The plan also includes increase funding for renewals and with improved information on the condition of assets and high leakage areas, priority areas will be identified to reduce leakage and service disruptions.</p>

2.7 Linkages

The most relevant legislation, planning documents and other significant documents relating to this activity include:

- Health Act 1956
- Local Government Act 2002
- Taumata Arowai – Water Services Regulator Act 2020
- Water Services Bill
- Local Government Act 1974
- Public Works Act 1981
- Climate Change Response Act 2002
- Climate Change Response (Zero Carbon) Amendment Act 2019
- Health and Safety at Work Act 2015
- Building Act 2004
- Civil Defence Emergency Management Act 2002
- Resource Management Act 1991
- National Policy Statement for Freshwater Management
- National Environmental Standards for Freshwater
- National Environmental Standards for Sources of Human Drinking Water
- Grey District Council Long Term Plan and Annual Plans
- West Coast Regional Policy Statement
- West Coast Regional Council Plans
- Grey District Lifelines Utilities Plan
- West Coast Regional Council Lifelines Utilities Strategy.
- Infrastructure Strategy
- Grey District Plan
- All relevant Grey District Council Bylaws
- Water Safety Plans

3. What The Future Looks Like

This section provides an overview of relevant information about our District and identifiable trends and forecasts that we have considered in future planning for the water supply activity area. Our plans for the future (section 4 of this plan) take in to account these matters, and the key assumptions on which our long term planning is based are noted in section 7.2 of this plan.

3.1 Three Waters Reform Programme

In 2017 the Government initiated a Three Waters Review process for drinking water, wastewater and stormwater, alongside the Havelock North Drinking Water Inquiry. This was a cross-agency initiative led by the Department of Internal Affairs (DIA), which looked into the challenges facing New Zealand's three waters systems and at system-wide performance improvements.

A number of changes are likely to occur to water supply service delivery and regulation over the term of the LTP as a result of the review. The most significant of these are outlined below.

Service Delivery Reform

As a result of the Three Waters Review, the Government is proposing a programme for reforming three waters service delivery arrangements, which is to be delivered in parallel with an economic stimulus package of Crown investment in water infrastructure. This reform will be a significant area of focus for the Council in the initial period of the LTP.

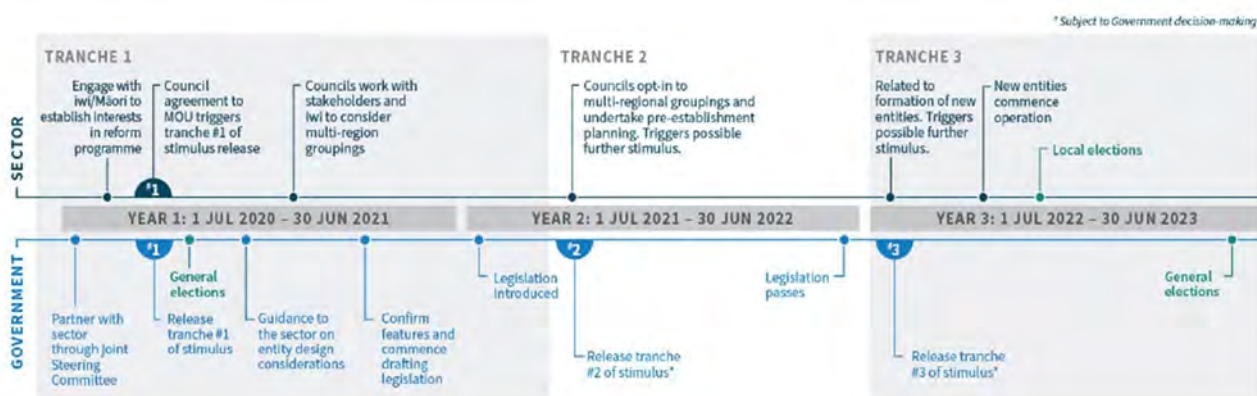
From 2022 onwards, there is likely to be a new regional entity responsible for delivering water supply services in the Grey District and wider region. There will potentially be an ongoing role for Council in collective ownership in relation to the regional entity but it is likely we will no longer be involved in planning and delivery. At the time of writing however, there is no specific proposal or format for any new entity around which community consultation can take place.

The objectives of the Government's reform include:

- Improving safety and quality of drinking water services and the environmental performance of wastewater and stormwater systems;
- Seeking to ensure all New Zealanders have equitable access to affordable three waters services;
- Increasing resilience of three waters service provision to both short and long term risks and events, particularly climate change and natural hazards; and
- Moving three waters services to a more financially sustainable footing and addressing affordability and capability challenges faced by small suppliers and councils.

There are three phases of reform, with three tranches of central government investment proposed. The indicative timeline for the review is as follows⁶:

⁶ Department of Internal Affairs website: *Slides from July/August 2020 Workshops*



The first phase of the programme involves central and local government working together to design and develop the proposed new service delivery arrangements and operating models. The initial focus of phase one is on drinking water and wastewater assets and services.

As noted above, the government has outlined its expectation that there will be new service delivery arrangements, such as multi regional entities that reflect neighbouring catchments and communities of interest. These new entities would be publicly owned, with government noting a preference for collective council ownership and the inclusion of mechanisms to protect against privatisation in the future. The entities would likely be governed by competency-based boards.

At a minimum, drinking water and wastewater would be included in the new water entities. Stormwater services may be included at a later date, where it is considered efficient and effective to do so.

In August 2020 Grey District Council signed a memorandum of understanding with the government, agreeing to participate in the initial stages of the three waters service delivery reform programme. It also entered into a funding agreement to accept a grant from the government to spend on operating and/or capital expenditure relating to three waters infrastructure and service delivery. The majority of this expenditure will occur in the water supply activity area, with some expenditure on improved network monitoring and information.

The Council is also currently assessing and collating detailed information about its three waters network assets to provide to the Department of Internal Affairs (DIA). All Councils are responding to this request for information regarding their network assets. This information is intended to enable DIA analysis and advice to Ministers on the relative merits of various options for the reform of water services delivery.

Regulatory Reform

Water Services Bill

In 2019, following the Three Waters Review, the government began work on a framework for implementing a new drinking water regulatory system. The new framework involves the creation of a new Water Services Regulator known as *Taumata Arowai*. Work is being done to establish this entity and framework at present, through the Taumata Arowai Establishment Unit within the Department of Internal Affairs.

The role of Taumata Arowai will be to administer and enforce a new, expanded and strengthened drinking-water regulatory system. It will also provide national oversight of the regulation, management and environmental performance of wastewater and stormwater networks.

The *Taumata Arowai – Water Services Regulator Act*, passed in July 2020, establishes Taumata Arowai as a Crown Agent and provides for its objectives, functions, operating principles and governance arrangements.

A complementary Bill, the Water Services Bill, is now before Parliament. This Bill is anticipated to be introduced in the second half of 2021. At that time, Taumata Arowai will become Aotearoa's dedicated regulator of the three waters. Until then, the Ministry of Health remains the regulator of drinking water.

Other Reform

There is also potential for further changes in relation to regulatory protection of water supplies as part of the Three Waters Review. In September 2019 the government released a discussion document *Action for Healthy Waterways – A Discussion Document on National Direction for our Essential Freshwater*. The document contained high level proposals relating to increased regulatory protection for drinking water sources (rather than service delivery outlined above).

The proposal is to amend the Drinking Water National Environmental Standard (NES) to strengthen land use and development activity controls in source water risk management areas and will include a requirement to notify the water supply operator of any resource consent applications in those areas.

Detailed proposals relating to three waters are to be considered and consulted on at a later date, as part of reforms to the regulation of Three Waters infrastructure. The timing of this process is a yet unknown but may be within the term of this AMP.

What this means for Water Supply Management

Our Council will continue to work with neighbouring Councils and central government on new arrangements for the delivery of water and wastewater services and seek funding for and undertaking capital and operational works in the District as part of the economic stimulus package. At the same time, we will continue to operate and maintain our water supply networks. At the time of writing, we have sought funding for a number of priority projects as part of the reform programme. These projects are planned for completion in Year 1 of the LTP.

As noted above, from 2022 onwards the signals are that there will be a new regional entity responsible for delivering water supply services in the Grey District and wider region. There will potentially be an ongoing role for Council in collective ownership in relation to the regional entity but it is likely we will no longer be involved in planning and delivery.

The form of any new arrangements is not known at present. Until this is further developed, for planning purposes the Council has assumed that it will deliver these services over the life of the LTP, acknowledging that this assumption has a high degree of uncertainty. We note that our community will need these services, whether they are delivered by the Council or not, and this activity is therefore reflected in our Financial and Infrastructure Strategies and in this AMP.

Given the proposed timing of establishment of the new regional entity, it is likely that the proposed reforms to regulation of water supplies will apply to that entity as service provider, rather than the Council. However, as with service delivery, we have included the impact of these reforms in our planning given the present uncertainty around the timing of any outcomes.

3.2 Covid-19

The Covid-19 pandemic has caused major disruption to life and economic activity around the world. The pandemic has drastically altered the economic outlook here and abroad. Governments continue to respond with a range of health-related and economic support measures.

Treasury's main economic forecast in its *Pre-election Economic and Fiscal Update* (16 September 2020) noted that *...infection rates are still rising in many parts of the world and the timeline for the development of a vaccine or effective treatment is still very uncertain. Community transmission re-emerged in New Zealand in August following a 102-day period during which there was no evidence of transmission, and the country returned to higher alert levels. These developments highlight the continued uncertainty about New Zealand's economic outlook*.

Since that Treasury report, there have been advances in the development of vaccines for the disease. In

November 2020 the government announced that provided the first of these vaccines are approved for use in New Zealand, it is possible that some doses will be available in the first part of 2021⁷. A subsequent announcement indicated that 2 million doses of a second vaccine could be delivered from the third quarter of 2021, with the option to purchase up to 3 million additional doses to be delivered throughout 2022⁸.

Considerable uncertainty remains around the global economic outlook, although Treasury has noted that optimism surrounding the promising vaccine news has boosted global risk sentiment⁹.

While the development of effective vaccines is promising, at the time of writing many of our assumptions about the future will continue to be disrupted by the pandemic in the short to medium term. For many districts including ours, effects from Covid-19 will continue to be felt, particularly impacts to economic vitality and tourism. Sectors reliant on international travel and tourism were the hardest hit, and continue to be affected by current border controls.

The long-term effects of the pandemic are also uncertain. Many countries including New Zealand continue to restrict traveller entry and movements and impose quarantine regulations. World financial markets have become unstable and the tourism, student, fishing, timber, export and manufacturing markets to and from China have reduced.

The current major impact for the Grey District at the time of writing is reduced tourism as international tourists are restricted in movement. The rate of unemployment throughout the Grey District is expected to rise as we continue to see effects from Covid-19 particularly on the tourism and hospitality sector, which is a significant contributor to our economy.

Maintaining capacity and capability, consumption activity and protecting jobs is largely dependent on the actions of central government and financial institutions. Central government has implemented fiscal policies that maintained levels of employment and incomes for many in the short term during the lockdown period when many businesses were unable to generate revenue. The long-term effects of these policies are yet to be known. Along with carefully constructed fiscal policy, monetary policy will need to be responsive to a downturn in consumption and the major changes to the tourism industry to support jobs and disposable incomes in the domestic economy.

At present there is ongoing uncertainty around the management of Covid and its long term effects, but there are also some factors that may help our district to be resilient as we look to recover. These include projects that Council will be proceeding with, such as the new slipway and wharf replacements at the port. As many of the future impacts are unknown at this stage, Council will look to monitor and review its objectives and delivery as needed over the period of the Long Term Plan (LTP).

What this means for Water Supply Management

Considering the challenges being faced by Council identified in Section 2.1 including the potential slowing of growth in the District, impacts on this activity are expected to be medium. Obtaining components that rely on overseas supply, with border controls and the availability of human resources in manufacturing industries in other countries is likely to cause a time delay in the first 1 to 3 years of this Plan. A number of our activities in this area provide services directly to our community, are required asset maintenance or management activities, or are statutory requirements.

3.3 Growth and demand

Population

⁷ 'COVID-19 vaccine progress encouraging' Beehive press release, 10 November 2020

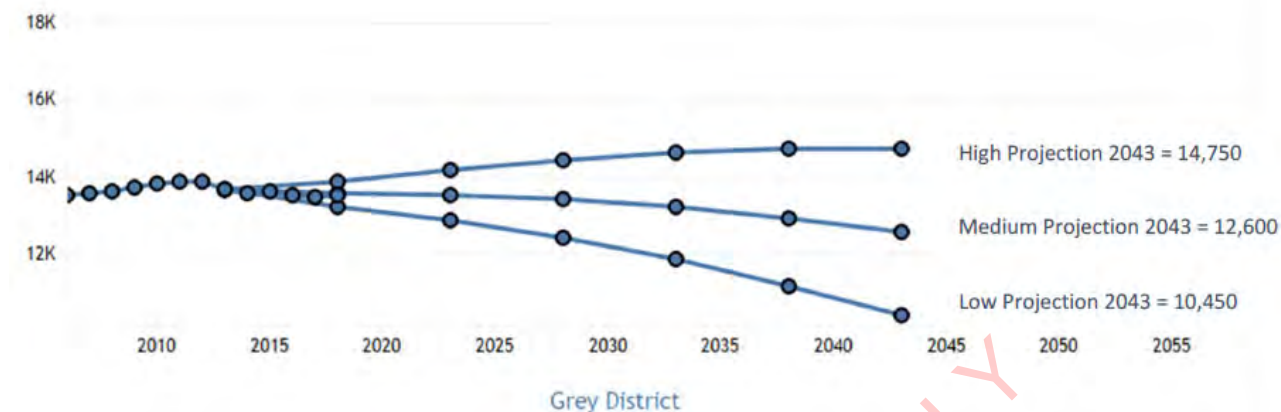
⁸ 'Agreement advanced to purchase up to 5 million COVID-19 vaccines' Beehive press release, 19 November 2020

⁹ Treasury *Te Tai Ōhanga Weekly Economic Update* 13 November 2020

The population of the Grey District in 2019 according to Infometrics data¹⁰ was 13,750 people.

The overall population projections released by Statistics New Zealand show that expectations are that the Grey District and the West Coast region through to 2043 will experience a decline in population.

Between 2014 and 2019 the Grey District experienced a 0% population growth rate. The expectation is that this 0% population growth rate will continue through to 2028 (according to medium projections). By 2043, Grey District is projected (according to medium projections) to see its population decrease by 7% to 12,600.



Population by Age Group

In 2018, the population distribution of the Grey District shows that 19% of the population was in the age group 0-14 years (2,550 people), 27% in 15-39 years (3,650 people), 35% in 40-64 years (4,800 people), while 19% population was in the age group of 65+ years (2,550 people).

In 2023 (based on high projections), the population distribution of the Grey District shows that 20% of the population will be in 0-14 years (2850 people), 25% in 15-39 years (3600 people), 33% 40-64 years (4650 people), while 22% will be in the 65+ years (3100).

The data shows the trend towards a continuation of an aging population in the Grey District.

Projection data on births in the Grey District also shows that the birth rate is expected to decline gradually between 2020 and 2041.

Population by Area

Census data from the Stats NZ website showing the usually resident population of each of the sub-areas in the district is set out below. Increases and decreases in population within each area unit are shown.

		Total people		
Year		2006	2013	2018
Area				
Grey District		14049	13947	13770
Barrytown		1014	978	939

¹⁰ Note: the data provided is sourced from Infometrics population figures. These figures use the Statistics New Zealand's Estimated Resident Population (ERP), as opposed to the Census Data. The ERP data is provided and has been adjusted for the following: net census undercount (based on the 2013 Post-enumeration Survey), residents temporarily overseas.

		Total people		
Year		2006	2013	2018
Runanga		1233	1221	1146
Cobden		1707	1635	1515
Blaketown		846	837	798
Greymouth Central		1809	1440	1368
King Park		1254	1161	1074
Marsden		1152	1221	1200
Karoro		963	1095	1077
Rutherglen-Camersons		1167	1242	1389
Greymouth Rural		549	651	717
Dobson		819	810	810
Nelson Creek		729	714	669
Lake Brunner		804	942	1059

This shows an increase in resident populations in three areas (Rutherglen/Camersons, Greymouth Rural, and Lake Brunner), but a decline in all other sub-areas between the 2013 and 2018 census.

Industry/commercial factors have been assumed to follow general increases and/or decreases in population for each community area.

Growth and Demand

Prior to 2018 the District had been undergoing significant growth through subdivision and other forms of development. However, there were indications that this level of growth was slowing down. The table below shows that the number of new dwellings under construction has reduced significantly in most areas.

The table below also shows the number of occupied and unoccupied dwellings taken from the 2006, 2013 and 2018 censuses. The highest levels of unoccupied dwellings occur in community areas where there are a high proportion of holiday homes, such as the Lake Brunner area.

		Occupied dwellings			Unoccupied dwellings			Dwellings under construction		
Year		2006	2013	2018	2006	2013	2018	2006	2013	2018
Area										
Grey District		5187	5397	5391	849	972	1149	57	39	15
Barrytown		387	408	417	132	114	135	9	0	0
Runanga		540	537	522	66	63	87	3	0	3
Cobden		690	693	666	57	63	87	0	3	3
Blaketown		357	372	372	27	30	36	0	0	0
Greymouth Central		465	420	402	42	42	63	0	3	0
King Park		519	498	489	42	36	66	3	3	0
Marsden		456	498	498	33	39	42	3	0	0

		Occupied dwellings			Unoccupied dwellings			Dwellings under construction		
Year		2006	2013	2018	2006	2013	2018	2006	2013	2018
Karoro		369	411	414	27	27	45	9	6	3
Rutherglen-Camersons		405	474	516	18	36	48	3	12	6
Greymouth Rural		225	267	285	36	66	63	6	6	0
Dobson		324	342	342	36	60	48	6	3	0
Nelson Creek		276	294	279	36	45	78	0	3	0
Lake Brunner		174	186	189	303	348	354	18	3	3

Analysis the above Statistics NZ information shows the following trends.

Statistics Area	Includes communities	Total Occupied/Unoccupied/Under Construction			Percentage Change			Average (Years)
Year	Urban/Residential	2006	2013	2018	2013 /2006	2013 /2018	Overall	12
Grey District		6093	6408	6555	5.2%	2.3%	7.6%	0.6%
Barrytown	Barrytown, Blackball, Razor Back (Punakaiki)	528	522	552	-1.1%	5.7%	4.5%	0.4%
Runanga	Runanga, Rapahoe	609	600	612	-1.5%	2.0%	0.5%	0.0%
Cobden	Cobden	747	759	756	1.6%	-0.4%	1.2%	0.1%
Blaketown	Blaketown	384	402	408	4.7%	1.5%	6.3%	0.5%
Greymouth Central	Greymouth	507	465	465	-8.3%	0.0%	-8.3%	-0.7%
King Park	Greymouth (East-Shakespeare Street)	564	537	555	-4.8%	3.4%	-1.6%	-0.1%
Marsden	Greymouth (East - Marsden Road)	492	537	540	9.1%	0.6%	9.8%	0.8%
Karoro	Karoro	405	444	462	9.6%	4.1%	14.1%	1.2%
Rutherglen-Camersons	South Beach, Paroa, Gladstone, Camersons	426	522	570	22.5%	9.2%	33.8%	2.8%
Greymouth Rural	Kaiata, Marsden, Rutherglen	267	339	348	27.0%	2.7%	30.3%	2.5%
Dobson	Dobson, Taylorville, Stillwater	366	405	390	10.7%	-3.7%	6.6%	0.5%
Nelson Creek	Nelson Creek, Ahaura, Totara Flat	312	342	357	9.6%	4.4%	14.4%	1.2%

Statistics Area	Includes communities	Total Occupied/Unoccupied/Under Construction			Percentage Change			Average (Years)
Year	Urban/Residential	2006	2013	2018	2013 /2006	2013 /2018	Overall	12
Lake Brunner	Moana, Beechwater, Te Kinga, Mitchells	495	537	546	8.5%	1.7%	10.3%	0.9%

Assuming a change of over 2% per year is significant it can be inferred from the above table where growth and decline has occurred the District. The highest growth areas considering averages of the 12 years of data have been in the following areas:

- Rutherglen – Camerons
- Greymouth Rural

The Infrastructure Services Department keeps a record of resource consents it is requested to process with respect to effects. An assessment of the data from 1 July 2009 to 30 June 2020 (Ten full years) is presented in the following table using the same statistical areas as Statistics NZ. The average percentage change in the number of houses from the Census data has been included from the previous table to allow a comparison.

Statistics Area	Includes communities	Average % Change per year (Years)	Subdivision Consents				
Year	Urban/Residential	12	Urban/Rural	Pro-cessed	% Total	Number New Lots	% Total
Grey District		0.6%	Mix	226	100%	472	
Barrytown	Barrytown, Blackball, Razor Back (Punakaiki)	0.4%	Mix	20	8.8%	53	11.2%
Runanga	Runanga, Rapahoe	0.0%	Urban	8	3.5%	13	2.8%
Cobden	Cobden	0.1%	Urban	12	5.3%	17	3.6%
Blaketown	Blaketown	0.5%	Urban	12	5.3%	23	4.9%
Greymouth Central	Greymouth	-0.7%	Urban	28	12.4%	58	12.3%
King Park	Greymouth (East-Shakespeare Street)	-0.1%	Urban	13	5.8%	19	4.0%
Marsden	Greymouth (East - Marsden Road)	0.8%	Rural	2	0.9%	2	0.4%
Karoro	Karoro	1.2%	Urban	14	6.2%	34	7.2%
Rutherglen-Camerons	South Beach, Paroa, Gladstone, Camerons	2.8%	Mix	34	15.0%	117	24.8%

Statistics Area	Includes communities	Average % Change per year (Years)	Subdivision Consents				
Year	Urban/Residential	12	Urban/Rural	Pro-cessed	% Total	Number New Lots	% Total
Greymouth Rural	Kaiata, Marsden, Rutherglen	2.5%	Rural	26	11.5%	38	8.1%
Dobson	Dobson, Taylorville, Stillwater	0.5%	Mix	20	8.8%	30	6.4%
Nelson Creek	Nelson Creek, Ahaura, Totara Flat	1.2%	Rural	13	5.8%	22	4.7%
Lake Brunner	Moana, Beechwater, Te Kinga, Mitchells	0.9%	Mix	24	10.6%	46	9.7%

Based on the number of subdivisions in each area and assuming over 5% in an area is significant, as well as Rutherglen-Camers and Greymouth Rural, some growth is also predicted to occur the Barrytown area (which includes Blackball), Greymouth Central (infill development), Karoro, Dobson and Lake Brunner.

The following table also confirms in what District Plan Environmental Zone the subdivisions are occurring.

Main District Plan Zone	Land Use	% Type	Other	% Type	Subdivision	% Type	Grand Total
Commercial	24	7%	2	7%	7	3%	33
Industrial	14	4%	2	7%	14	6%	30
Residential	142	41%	8	27%	71	31%	221
Residential	1	0%		0%		0%	1
Rural	119	35%	17	57%	115	51%	251
Rural	1	0%		0%		0%	1
Rural - Residential	23	7%	1	3%	15	7%	39
Township	20	6%		0%	4	2%	24
Grand Total	344	100%	30	100%	226	100%	600

Notes:

1. In some cases, subdivisions also include land use consents. These have not been counted as the focus is to identify the number of new lots created that could have an effect on this activity.
2. Only new lots are counted as for instance an existing area of land is subdivided into two lots, only the new lot could have an effect on this activity.
3. The category "Other" includes Plan Changes, Outline Plans, boundary adjustments etc.

Demands for new or upgrade of existing infrastructure is predicted to be as outlined in the table below, for each Census Statistical Area. Community Areas have also been identified for each Statistical Area as this at an infrastructure level helps identify where new services are needed for this activity. The change in the percentage of households over the last three census periods and the total number of subdivision consents over the last 10 years has been retained from the previous tables, to support the predictions of where increased demand is likely to occur.

Statistics Area	Includes communities	Average % Change per year in number of households (12 - Years)	Subdivision Consents – Last 10 years	Demand	Need for new/extended services for this activity
Year		12	% Total	Council Water Supplies	Council Water Supplies
Grey District		0.6%			See below, demand is in certain areas of the District
Barrytown	Barrytown, Blackball, Razor Back (Punakaiki)	0.4%	11.2%	Medium	To date, mostly rural subdivision with low impact on services. Buller District Council is considering a new water supply for Punakaiki that could also service the Razor Back area. While not funded in the LTP, potentially Blackball Township may need to increase the capacity of services for this area to cater for tourism growth
Runanga	Runanga, Rapahoe	0.0%	2.8%	Low	Low growth, may be infill development between Runanga and Rapahoe
Cobden	Cobden	0.1%	3.6%	Low	Low growth - if occurs likely to be rural-residential with low impact of services
Blaketown	Blaketown	0.5%	4.9%	Low	Low growth, limited land, general infill with low impact on services
Greymouth Central	Greymouth	-0.7%	12.3%	Low	Generally infill subdivision, e.g. large urban sections being subdivided down to smaller units, low impact on this activity as services in place
King Park	Greymouth (East-Shakespeare Street)	-0.1%	4.0%	Low	Low growth, limited land, low impact on this activity, services in place
Marsden	Greymouth (East - Marsden Road)	0.8%	0.4%	Low	Low growth, limited land, low impact on this activity, services in place
Karoro	Karoro	1.2%	7.2%	Low	Desirable growth area but limited by available land, low impact on services
Rutherglen-Camersons	South Beach, Paroa, Gladstone, Camersons	2.8%	24.8%	High	Other than Paroa where there has been a District Plan change from rural to residential, other subdivisions have all been rural-residential with low impact on services for this activity. Potentially could change to high impact if currently zoned rural land is zoned residential in the future. Activity includes a feasibility study to extend the water supply to Gladstone which is a residential area with rain water tank supply.
Greymouth Rural	Kaiata, Marsden, Rutherglen	2.5%	8.1%	Medium	Subdivisions have been rural - residential with low impact on services for this activity. Potentially could change to high impact if currently zoned rural land is zoned residential in the future. Includes Kaiata Park Development area which was a District Plan change from rural to residential-commercial.
Dobson	Dobson, Taylorville, Stillwater	0.5%	6.4%	Low	Low growth, limited land, generally infill with low impact on services.
Nelson Creek	Nelson Creek, Ahaura, Totara Flat	1.2%	4.7%	Low	Low overall growth, tending to be subdivision of rural lots with no impact on this activity.
Lake Brunner	Moana, Beechwater, Te Kinga, Mitchells	0.9%	9.7%	High	Previous growth which slowed down but current trends indicate future increase in demand. While not funded in the LTP an urban water supply may be needed for Moana to cater for domestic tourism and to provide increased safety for fire fighting given the increasing size of the township.

What this means for Water Supply Management

While there will be no significant increase in demand based on population growth projections there are increases in community areas. To date other than infill development most changes are in rural and rural-residential areas where there is a lower demand for services. However this could change with future zone changes to *Te Tai o Poutini* Combined District Plan (see paragraph below) or privately initiated plan changes. Changes are identified in the previous section and have been signalled for future LTPs. Council does not provide water supply services in rural and rural-residential areas.

There will be financial implications for the management of water supply infrastructure such as renewals and upgrades from any projected decline in population in the long term. Council will continue to monitor the affordability of services where there is a reduced ratepayer base and/or an increase in the number of ratepayers on fixed incomes. We note that the Three Waters reform programme includes a focus on affordability, and funding structures are likely to change under any new regional entity.

Inferences from the growth and demand tables above are that growth is low, and in areas where growth is occurring, there is a lower need for new public infrastructure as the areas tend to be rural or rural-residential. Fifty eight percent (58%) of subdivision in the last 10 years has occurred in rural and rural – residential areas. Exceptions are likely to be:

- Moana, if future urban subdivision of rural land occurs beyond currently residentially zoned land. For this activity a decision needs to be made to provide a fire fighting water supply for the Moana Township.
- Gladstone, where a joint investigation is signalled to assess the feasibility of the provision of water supply and a waste water collection systems for Gladstone.
- Blackball, where potential increases in tourism demand mean the existing water supply capacity may need to be increased.

New subdivision and other types of development (supermarkets and industrial parks) may necessitate the upgrading of existing systems to cope with increased use. With respect to subdivision development, requirements are in place to recover the costs of any required increase in capacity. Contributions from developers are likely to be required through the resource consent process. Council may also need to contribute to the works, as major infrastructure is not upgraded on an incremental basis for practical, economic and efficiency reasons.

Compared to the total length and extent of existing assets Council is responsible for owning and maintaining, increased infrastructure through development in the District is only likely to contribute to small incremental increases in for instance length of networks.

No allowance has been made in this AMP for increased demand for these reasons.

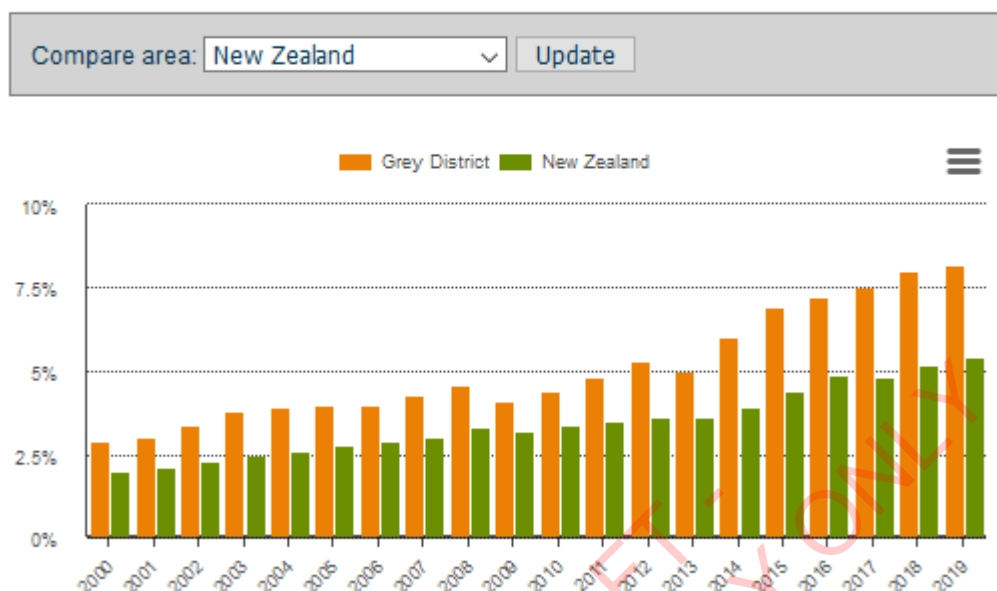
Council is presently engaged in a collaborative process with the West Coast Regional Council and Buller and Westland District Councils to develop a combined District Plan for the region. Following extensive public consultation the Plan will identify new zones for growth and development, as well as identifying areas where growth should not occur (such as areas subject to natural hazards). This planning is likely to take a number of years, with changes not likely to take effect until late in the LTP period. Council will remain actively involved as the process develops, given its significance for the community and for future strategic and infrastructure planning, including water supplies.

3.4 Tourism and visitor growth

As well as population and demographics being key drivers for our asset management activities, other factors such as growth associated with tourism activity can be significant. Sectors such as tourism may create demand through development in some areas and pressure on existing systems or the need for new systems.

Tourism has long been a significant contributor to the economy of the Grey District¹¹:

Tourism share of total GDP, 2000-2019



As described above, the impact of the global pandemic Covid-19 is expected to be significant on tourism and visitor growth in the District over the initial period of the Long Term Plan. The exact extent of these impacts are largely unknown at this stage.

Treasury's main economic forecast in its *Pre-election Economic and Fiscal Update* (16 September 2020) assumes that border restrictions will remain in place until 1 January 2022, thereby preventing short term recovery in the international tourism sector. Border restrictions are assumed to begin easing from the September 2021 quarter onwards, allowing for a partial resumption of some services exports, possibly as a result of safe travel zones.

Treasury's assumption is that overseas tourism will likely take some time to recover, reflecting negative income effects, changed travel preferences and lingering airline capacity effects. Some of the reduced international tourism activity will be offset by an increase in domestic tourism activity. However the magnitude of the increase is also unlikely to fully offset the reduction in international spending.

What this means for Water Supply Management

There is potential for the slowing of growth in the District from the reduction in tourism activity in the short to medium term, however impacts on the water supplies activity will be minor. When tourism recovers, it may influence demand further in areas such as Moana and Blackball which has also been discussed in Section 3.3. above. However this is likely to be in the long term, and timeframes and outcomes are as yet uncertain.

Council will continue to monitor visitor growth and any consequent demand for water supplies. For example, if demand increases following a recovery in tourism, a water supply scheme for Moana may be sought. Similarly there may also be a need to increase capacity at Blackball should tourism levels recover and increase the demand for potable water.

¹¹ Infometrics - *Grey District Economic Profile*

Many of the other activities in this area provide services directly to our community, are required asset maintenance or management activities, or are statutory requirements and are unaffected by visitor levels.

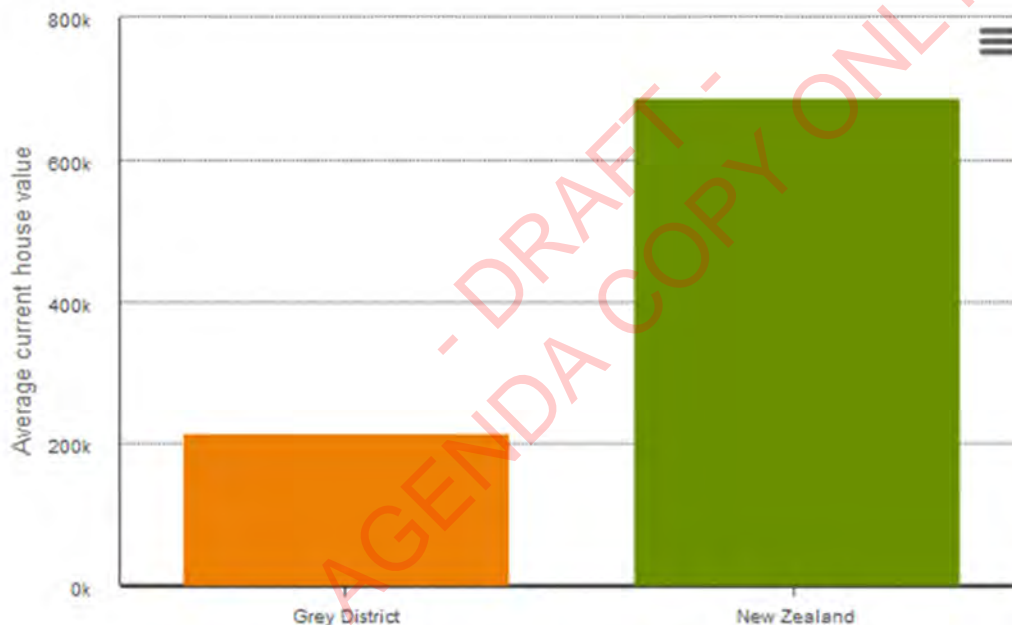
3.5 Economic changes

In 2019, the Grey District had mean (average) annual earnings of \$57,521 and the West Coast region had mean (average) earnings of \$56,758. New Zealand (excluding Auckland) by comparison had mean annual earnings of \$59,615.

Mean annual earnings in the District had increased by 4.6% since 2018, a slightly higher rate than the rest of New Zealand (excluding Auckland) which showed an increase of 3.9%.

For June 2019, the average house price in Grey District was \$219,620, compared with \$196,518 in Buller District and \$254,041 in Westland District. In the same period the average weekly house rent in Grey District was \$290, compared with \$248 in Buller District and \$310 in Westland District.

Average current house values, 2019



The housing affordability index is the ratio of the average current house value to average household income. A higher ratio suggests that median houses cost a greater multiple of typical incomes, which indicates lower housing affordability.

Housing affordability, 2006-2019



The graph¹² above shows that the District's housing when compared to the rest of New Zealand (excluding Auckland) is more affordable.

The Grey District in 2019 had an unemployment rate of 5.1%, compared to the West Coast region's rate of 4.8%. Figures for New Zealand (excluding Auckland) in 2019 show an unemployment rate of 4.3%. The Grey District's unemployment rate has increased from a low of 2.6% in 2007 to 5.1% in 2019.

As described elsewhere in this Plan, the extent of the impacts of the current global pandemic on the District and the national economy are highly uncertain at this stage. It is likely that unemployment will increase, and given the District's reliance on tourism as a significant contributor to our economy, our District may be more impacted than others.

What this means for Water Supply Management

Impacts on the management of water supplies are likely to be minor. There is an ongoing need for water supply services in our community for the reasons outlined in section 2 above. Our systems are designed to a certain capacity, and long-term management or improvement is based on the community's ability to pay. The Council has also been able to access funding from central government for improvement works and projects. The programmes outlined in this AMP for renewals and upgrades are planned with regard to these factors.

3.6 Climate change

Like many Councils, we are assessing available information and planning for the effects of climate change. This is because New Zealand's climate is warming, sea levels are rising, and extreme weather events are becoming more frequent and severe. The Ministry for the Environment's *National Climate Change Risk Assessment Main Report* released in August 2020 includes the following trends identified by the National Institute of Water and Atmospheric Research (NIWA):

- In the last 100 years, our climate has warmed by 1°C. If global emissions remain high, temperatures will increase by a further 1.0°C by 2040 and 3.0°C by 2090.

¹² Infometrics, 2019

- In the last 60 years, sea levels have risen by 2.44 mm per year. If global emissions remain high, sea levels will increase by a further 0.21 m by 2040 and 0.67 m by 2090.
- Extreme weather events such as storms, heatwaves and heavy rainfall are likely to be more frequent and intense. Large increases in extreme rainfall are expected everywhere in the country, particularly in Northland due to a projected increase in ex-tropical cyclones.
- The number of frost and snow days are projected to decrease, and dry days to increase for much of the North Island and for some parts of the South Island.
- Drought is predicted to increase in frequency and severity, particularly along the eastern side of the Southern Alps.
- Increased north-easterly airflows are projected in summer and stronger westerlies in winter, the latter particularly in the south of the South Island.
- Wildfire risk is predicted to increase in many areas towards the end of the century, due to higher temperatures and wind speeds, and decreased rainfall and relative humidity.

The report notes that although there is inherent uncertainty associated with these projections, particularly towards the end of the century, they provide plausible futures resulting from climate change.

Climate Change Projections

The Ministry for the Environment's climate change projections for the West Coast are outlined in the following table. The projected changes are calculated for 2031–2050 (referred to as 2040) and 2081–2100 (2090) compared to the climate of 1986–2005 (1995).

Temperature	<p>Compared to 1995, temperatures are likely to be 0.7°C to 1.0°C warmer by 2040 and 0.6°C to 3.0°C warmer by 2090.</p> <p>By 2090, the West Coast is projected to have up to 30 extra days per year where maximum temperatures exceed 25°C. The number of frosts could decrease by around 7 to 18 days per year.</p>
Rainfall	<p>Rainfall will vary locally within the region. The largest changes will be for particular seasons rather than annually.</p> <p>The West Coast is expected to become wetter, particularly in winter and spring.</p> <p>According to the most recent projections, extreme rainy days are likely to become more frequent throughout the West Coast region by 2090 under the highest emissions scenario.</p>
Wind	<p>The frequency of extremely windy days in the West Coast by 2090 is likely to increase by between 2 and 5 per cent. Changes in wind direction may lead to an increase in the frequency of westerly winds over the South Island, particularly in winter and spring.</p>
Storms	<p>Future changes in the frequency of storms are likely to be small compared to natural inter-annual variability. Some increase in storm intensity, local wind extremes and thunderstorms is likely to occur.</p>
Snowfall	<p>The West Coast region is likely to experience significant decreases in seasonal snow. By the end of the century, the number of snow days experienced annually could decrease by as much as 30-40 days in some parts of the region. The duration of snow cover is also likely to decrease, particularly at lower elevations.</p> <p>Less winter snowfall and an earlier spring melt may cause marked changes in the annual cycle of river flow in the region. Places that currently receive snow are likely to see a shift towards increasing rainfall instead of snowfall as snowlines rise to higher elevations due to rising temperatures. So for rivers where the winter precipitation</p>

	currently falls mainly as snow and is stored until the snowmelt season, there is the possibility for larger winter floods.
Glaciers	Overall glacier ice mass has decreased by 25 per cent over the last 60 years in New Zealand, and is expected to continue to do so into the future. Some of our most iconic glaciers (such as Franz Josef) have advanced in recent times. This is a result of more precipitation falling at their glacier heads. Whether these glaciers continue to advance into the future will depend on the balance between increased melting due to warmer temperatures and increased precipitation in the mountains. For example, one climate modelling study suggests the Franz Josef glacier may retreat approximately 5 km and lose around 38 per cent of its mass by 2100.
Sea level rise	New Zealand tide records show an average rise in relative mean sea level of 1.7 mm per year over the 20th century. Globally, the rate of rise has increased, and further rise is expected in the future. The Ministry for the Environment provides guidance on coastal hazards and climate change, including recommendations for sea level rise.

By 2090, seasonally the region could expect¹³:

Spring	<ul style="list-style-type: none"> • 0.6°C to 2.5°C temperature rise • 4 to 9 per cent more rainfall in Hokitika
Summer	<ul style="list-style-type: none"> • 0.6°C to 3.2°C temperature rise • 2 to 4 per cent more rainfall in Hokitika
Autumn	<ul style="list-style-type: none"> • 0.7°C to 3.1°C temperature rise • 2 to 5 per cent more rainfall in Hokitika
Winter	<ul style="list-style-type: none"> • 0.7°C to 3.1°C temperature rise • 8 to 29 per cent more rainfall in Hokitika

Risk Assessment and Next Steps

The Ministry for the Environment's *National Climate Change Risk Assessment Main Report* (August 2020) identifies New Zealand's 10 most significant climate change risks, based on urgency. These are set out below. This first national climate change risk assessment helps the Government identify where it needs to prioritise action.

The next step is the development of a national adaptation plan which will outline what is needed to respond to the risks. The Government will work with iwi/Māori, local government and others to develop the plan, which will be published by August 2022.

Some of the risks identified below clearly involve local government, and all would impact our community. The Council will continue to monitor developments in this area and work with other agencies as appropriate.

The report identifies New Zealand's 10 most significant climate change risks as follows:

DOMAIN	RISK	RATING
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¹³ Projected changes are relative to 1995 levels. The values provided capture the range across all scenarios. They are based on scenario estimates and should not be taken as definitive.

		Consequence	Urgency (44-94)
Natural Environment	Risks to coastal ecosystems, including the intertidal zone, estuaries, dunes, coastal lakes and wetlands, due to ongoing sea-level rise and extreme weather events.	Major	78
	Risks to indigenous ecosystems and species from the enhanced spread, survival and establishment of invasive species due to climate change.	Major	73
Human	Risks to social cohesion and community wellbeing from displacement of individuals, families and communities due to climate change impacts.	Extreme	88
	Risks of exacerbating existing inequities and creating new and additional inequities due to differential distribution of climate change impacts.	Extreme	85
Economy	Risks to governments from economic costs associated with lost productivity, disaster relief expenditure and unfunded contingent liabilities due to extreme events and ongoing, gradual changes.	Extreme	90
	Risks to the financial system from instability due to extreme weather events and ongoing, gradual changes.	Major	83
Built Environment	Risk to potable water supplies (availability and quality) due to changes in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise.	Extreme	93
	Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.	Extreme	90
Governance	Risk of maladaptation* across all domains due to practices, processes and tools that do not account for uncertainty and change over long timeframes.	Extreme	83
	Risk that climate change impacts across all domains will be exacerbated because current institutional arrangements are not fit for adaptation. Institutional arrangements include legislative and decision-making frameworks, coordination within and across levels of government, and funding mechanisms.	Extreme	80

* *Maladaptation* refers to actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas emissions, increased vulnerability to climate change, or diminished welfare, now or in the future. Maladaptation is usually an unintended consequence (IPCC, 2018).

What this means for Water Supply Management

Our water supply sources are from rivers, or are from groundwater closely connected to surface water. Hendy et al¹⁴ (2018) note that: *'Projections show rainfall in spring and winter increasing in the west of the country and decreasing in the east and north. However, summer will likely follow a different pattern, with wetter conditions in the east and drier conditions in the west and central North Island (MFE, 2016). River flows on the west coast of the South Island are likely to increase, as are those on the eastern flank of the Southern Alps.'*

Impacts on our water supply management may include

- The projected increased frequency of extreme rainfall events or the increase in rainfall intensities may impact on our water takes and infrastructure, which may result in a lower level of service

¹⁴ Hendy et al *'Drought and Climate Change Adaptation: Impacts and Projections'*, Motu Note #31, November 2018

with existing water supply services. Council as part of this activity is proposing to install an additional intake for the Greymouth Scheme.

- A desired increase in raw water storage at times of increased dry conditions. For this activity, this situation will be monitored. Blackball Water Supply Scheme has a raw water storage facility which holds approximately 2 weeks storage capacity of clean water when water in Blackball Creek becomes too turbid.
- Higher risk of pathogens with increased rain events. Allowance has been made for increased supervisory control and data acquisition systems to improve the management and reporting. Existing multi-levels barriers and treatment at intakes will prevent the pathogens entering systems. However increased monitoring will enable the detection of any increasing adverse trends and identify if any future treatment upgrades are necessary.
- More emphasis in leakage reduction and demand management with an increased pressure on available raw water in dry periods.

Other impacts include risks to physical infrastructure assets. There will be an ongoing need to monitor and consider solutions to actual or potential coastal erosion in built up areas or where Council infrastructure is at risk. Consideration of managed retreat for parts of the district that lie on or just above sea-level may be the most sustainable long-term approach. Processes such as the *Te Tai o Poutini* combined District Plan will work through issues and options across the West Coast region, including any controls on land use and development. In the long term, further growth and any associated increase in infrastructure may happen in areas that are already urbanised, which may see smaller townships in the district struggle to maintain services due to restrictions on land use due to natural hazards and climate change.

3.7 Natural Hazards

A natural hazard is defined in the Resource Management Act as:

*"...any **atmospheric or earth or water-related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding)** the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment."* (emphasis added)

The Grey District, being close to the sea and the Alpine Fault and in a high rainfall zone, is susceptible to natural hazards such as flooding, earthquakes, tornados and more. The impacts of natural disasters can be significant and impose substantial unbudgeted costs on the Council. Some communities are very vulnerable to extreme weather events, and to potential damage when the Alpine Fault ruptures.

Climate change (refer section 3.5 above) will likely increase the risk from natural hazards, increasing the frequency and intensity of extreme weather events.

More heavy rainfall will increase the risk of flooding, erosion and landslides, which is already high in many parts of the region. Many West Coast communities are located along narrow coastal and river strips beneath mountain ranges, leaving them exposed to increased risks of storms, flooding and landslides.

Some recent weather events which have caused significant damage to infrastructure and affected the district's economy are outlined below. The costs to the insurance industry are also included.

Event	Dates	Cost
Flooding and storm, North and South Islands	6-7 March 2015	\$1.3m nationally
Flooding and storm, West Coast, South Island	19-22 June 2015	\$8.6m (inflation adjusted)
Flooding	23-24 March 2016	\$30.9m nationally (inflation adjusted)
Cyclone Fehi	28-30 January 2018	\$45.9m nationally

Ex-tropical cyclone Gita	3-19 February 2018	\$35.6m nationally
Wind and flooding, West Coast	26 March 2019	\$4.09m
Extreme rainfall	6-7 December 2019	Not yet available

This demonstrates that extreme weather events have become more frequent and more severe over the past few years, with increasing costs to both households and businesses.

The Alpine fault, which has a high probability (estimated 30 percent) of rupturing in the next 50 years, is predicted to cause extensive damage throughout the Grey District. An earthquake scenario developed by Otago University Department of Geology suggests that a 400km rupture along the West Coast would break the earth's surface and cause avalanches, rockfalls and landslides. Strong ground shaking would affect properties and destroy bridges.

With these severe consequences the Grey District could become isolated for a long period of time with roads and communications networks cut off and disruption to power and water services.

Some implications for the District in relation to natural hazards are set out below.

Assumption	Implications
Coastal Hazards	Consideration of managed retreat for parts of the district that lie on or just above sea-level may be the most sustainable long-term approach. However, these communities are likely to prefer new or enhanced coastal protection works to protect both public and private property. Funding of these works will be up to the ratepayer unless central government steps in.
Flood Management	Increases in storm intensity and frequency of storms with increased rainfall will reduce the effectiveness of current flood protection infrastructure and require increased works to maintain levels of service. Managed retreat in these areas may also need to be considered.
Emergency Management	Emergency management plans must be robust with a strong base of knowledgeable staff and volunteers able to ensure the district keeps running in the event of increasing severe weather events and the potential alpine fault rupture. Townships should be equipped to deal with long periods of isolation.
Stormwater/Drainage Infrastructure	Increases in frequency of storms with increased intensity and higher intense rain will reduce the effectiveness of current storm / drainage infrastructure.
Climate Change Implications	Some of the implications are discussed above. Other implications include: <ul style="list-style-type: none"> Increasing frequency and intensity of flooding / sea level rise puts community safety at risk. Increasing frequency and intensity of flooding / sea level rise reduces the effectiveness of infrastructure around closed landfills. Impact on tourism which relies on the natural environment that is being affected by climate change.
Growth Limited to Urban Areas	Further growth of the district will happen in areas that are already urbanised and may see smaller townships in the district struggle to maintain services and their economy due to restrictions on land use due to natural hazards and climate change.

We note that RMA reforms signalled by the government will have a greater focus on hazards, climate change, land use management and mechanisms for managed retreat. These reforms are likely to take a number of years to develop and implement.

As part of the development of its Activity Management Plans and Lifeline Utilities Plans¹⁵ lifeline plans, the Council has undertaken work to prioritise efforts to prepare for a major disaster. The priority for getting Grey District infrastructure assets functioning and/or made safe after a natural disaster (specifically for earthquake) is as follows:

Lifeline:	Priority
Airport	1
Roads	2
Supplies (Food/Water/Materials)	3
Urban Drainage (Flooding/Sewage Overflows)	4
Water Supplies	5
High Integrity Buildings	6
Sewerage (Pipes/Plant)	7
Greymouth Port	8

Over time the Council has undertaken works to increase the resilience of its water supply assets, such as relocating the Greymouth water reservoir which was previously sited on land identified as high seismic hazard. Increasing the resilience of our assets in relation to natural hazard risk is an ongoing area of work.

What this means for Water Supply Management

Overall, impacts on the water supply activity area may include:

- As outlined above, increases in frequency of storms with increased intensity and higher intense rain may impact on our water takes and infrastructure.
- Vulnerability of water supply infrastructure such as buried pipes in soft ground, to natural hazards such as earthquakes and liquefaction.
- Damage to water supply network components such as reservoirs, pumps and treatment stations from natural hazards such as earthquakes.
- Poor water quality following earthquakes and storm events, for example due to increased sedimentation and/or increased build-up of gravel in rivers and erosion causing rivers to remain turbid.

Council will carry out upgrade works on its networks, based on priorities established from condition assessments. We will continue to improve the resilience of schemes as budgets allow, such as:

- Siting our infrastructure such as reservoirs in areas of lower hazard risk. This consideration is being taken into account with the siting and design of reservoirs for Cobden, Tasman Views (South Beach), Arnott Heights (Greymouth) and Perotti Street (Greymouth) over the 2020/21 and 2021/22 Financial Years. These reservoirs are to replace and increase the capacity of the existing Greymouth Reservoir which once the above works are complete will be decommissioned.
- Ensuring main reservoir pipeline burst valves are provided to stop reservoirs draining water if pipelines are broken during an earthquake. All reservoir sites, except the existing Omoto (Greymouth) reservoir, Arnott Heights reservoir and Stanton Crescent reservoir, have had burst valves installed. The Omoto reservoir is to become redundant and removed from operational service soon. Replacement reservoirs throughout Greymouth are in design at present and burst valves will be installed as part of this construction works. This includes the existing Arnott Heights reservoir site. This means that the Stanton Crescent reservoir will be the only remaining site to be addressed and this will be done as a minor capital improvement.
- Using flexible pipelines in replacements
- Bolting down all equipment and pumps
- Undertaking longer term assessments on buildings and pump stations

¹⁵ Statutory requirement under Section 60 of the Civil Defence Emergency Management Act 2002

- Lifelines planning to prepare for risk and emergency response in relation to priority networks

The Council recognises the need to continue to monitor and consider solutions to actual or potential coastal erosion in built up areas or where Council infrastructure is at risk.

3.8 Other Key Issues for the Water Supply Activity

This section provides information on other topics that may affect the Council's water supply management activities now and into the future, or are otherwise areas for change or development over the period of the LTP.

It is noted that the following information is based on the revaluation of this asset to the 30 June 2020. The assessment does not take into account work in progress over the 2020/21 year.

Deferred Renewals

Renewal expenditure is major work that does not increase the asset's design capacity or increase its planned level of service, but restores, rehabilitates, replaces or renews an existing asset to its original capacity or service level. The outcome from condition assessments carried out to date confirm we have deferred renewals which need to be addressed in order to maintain levels of service and avoid potential critical failures.

Implications of delaying renewal works include:

- High leakage rates, made worse by high pressures in some areas.
- Build-up of disinfection by-products, interfering with compliance rates. This is caused by high concentrations of natural organic matter in the source water. Levels fluctuate and non-compliance is intermittent. The situation may be aggravated by older-externally rougher pipes retaining build-up on the inside of the pipes.
- Old pipes are generally more rigid/brittle, which means in a seismic event they are more likely to fail.

The figure below indicates the approximate date of construction and age profile of the water pipe network in ten-year increments.

Figure: Age (years) profile of Water Supply pipes

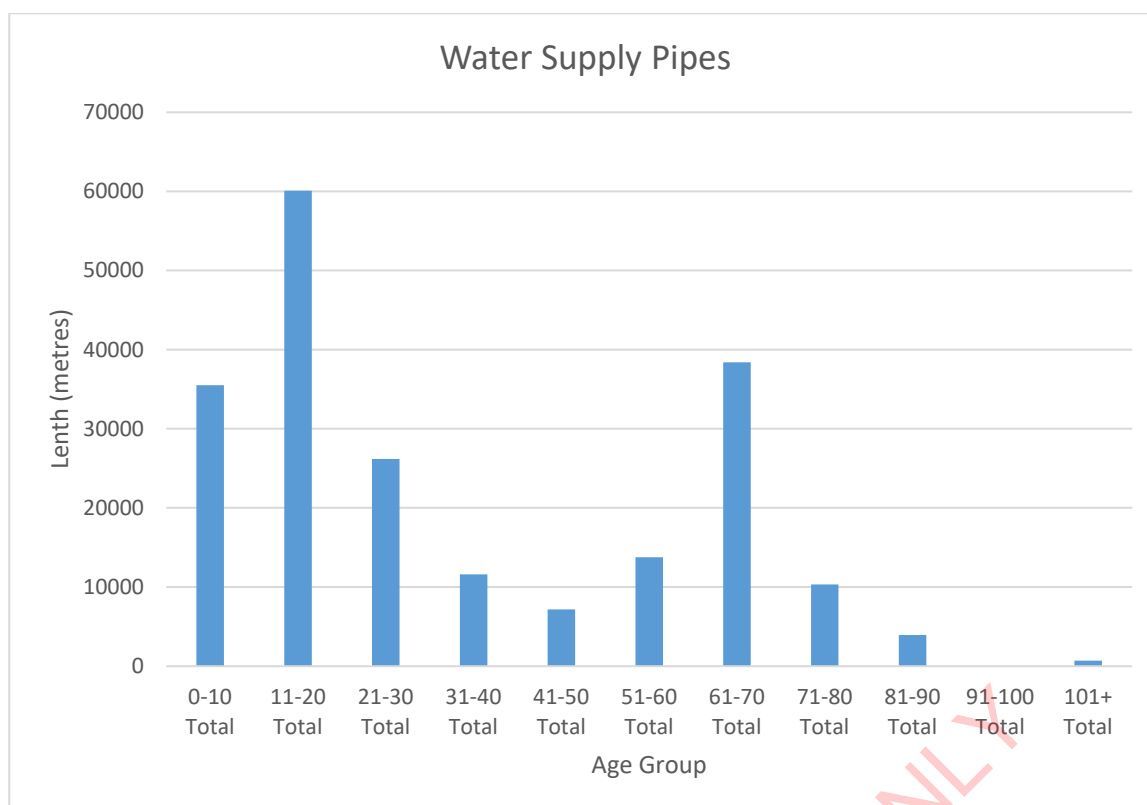
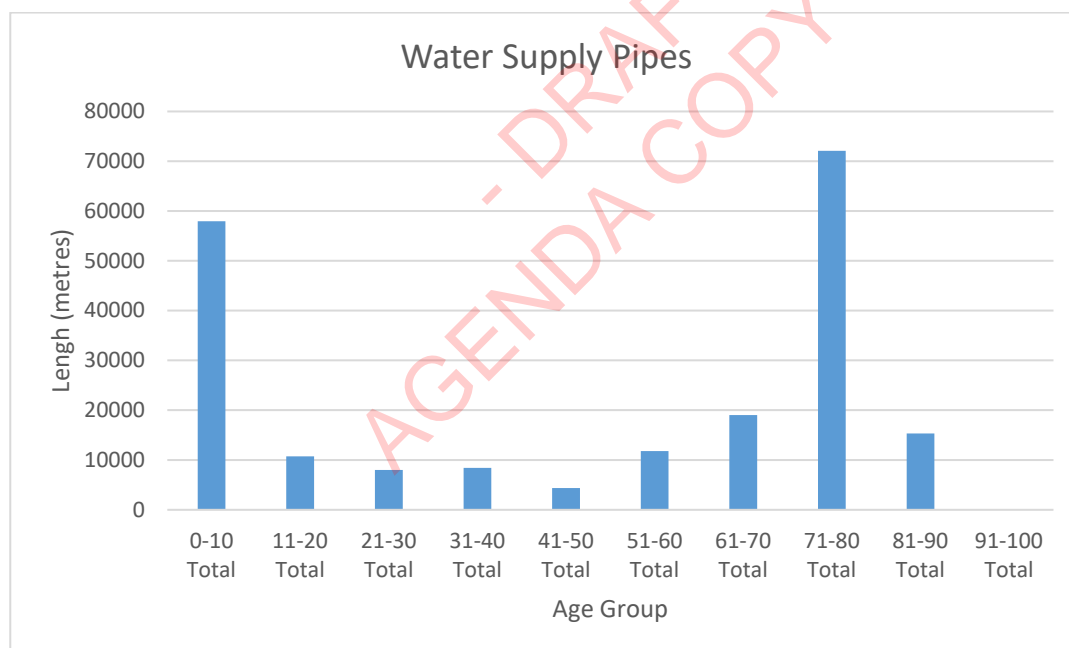


Figure: Remaining useful life profile of Water Supply pipes



The figures confirm that 28% of the total pipe network (207,607 metres) needs to be replaced based on age in the next 10 years.

Council is aware of the following potential consequences of underfunding renewals:

- Potential for critical failure if assets are not renewed/replaced in time
- Increased cost of maintaining assets that are past their use-by date.
- Failures will mean a reduction in the level of service currently provided by Council, or even loss of service (outage)

- Higher cost if renewing/replacing before the end of the asset's useful life
- Funding required for future works
- Lower resilience of older infrastructure in event of a natural disaster, e.g. earthquake
- Emergency works may be expensive and Council may have to loan fund this expenditure – this will impact on Council's debt levels and ability to borrow for other unforeseen events.

Information regarding our networks shows:

Detailed Description	Expected Service Life (years)	Average of Age	Length (metres)	Length (Kilometres)	% Total Length
Asbestos Cement (AC)	50-60	59	42900	43	20.7%
Concrete Lined Steel	60	68	585	1	0.3%
Cast Iron (CI)	90	75	9737	10	4.7%
Low Density Polyethylene (LDPE)	40-90	35	17988	18	8.7%
Copper	50-70	43	1407	1	0.7%
Steel	80-90	57	6909	7	3.3%
Unknown	60-70	38	6345	6	3.1%
Conc Lined Ductile Iron	60	14	420	0	0.2%
Galvanised Steel	80-90	25	141	0	0.1%
Polyvinyl chloride - Unplasticized (uPVC)	80-90	20	66762	67	32.2%
Polyvinyl chloride - Modified (PVC-M)	90	16	4766	5	2.3%
Medium Density Polyethylene (MDPE)	50-90	13	29572	30	14.2%
High Density Polyethylene (HDPE)	80-90	4	6559	7	3.2%
Polyvinyl chloride - Orientated (PVC-O)	80-90	5	13517	14	6.5%
Totals		27	207607	208	100.0%

- Almost 21% of the network consists of Asbestos Cement Pipe.
- For some materials the actual age exceeds the base life such as AC and concrete lined steel.
- The majority of the length of the network (89%) comprises pipe sizes of 150 mm (6 inch) or less
- These 150 mm or smaller pipes comprise 75% of the value of the pipe assets. Larger size pipes go up to 375 millimetres diameter.

Council's assessments have established the following:

- 23% (46.4 kilometres - \$10.8 million) of the pipe network has exceeded its base life; that is, its useful life. This is significant and indicates a backlog of pipes that may fail in the short term.
- The useful life from industry standards is the maximum life the asset component will last in service. The base lives for this asset component vary from 40 to 90 years depending on the pipe material used. Earlier established communities have older infrastructure, being Greymouth, Cobden, and Blaketown, Runanga and Dobson-Taylorville.
- The Greymouth Scheme which provides water to Greymouth, Blaketown, Cobden, Dobson-Taylorville, Stillwater, Karoro, South Beach and Paroa comprises 76% of the value of the infrastructure. Currently Runanga Rapahoe (18% by value) is also connected to the Greymouth Scheme.

Map of renewals backlogs

The following table and maps provide a good picture of the level of renewals required for this activity. This table and maps show that older pipes that are past their potential use by date exist in

the more earlier established communities. This is about 46.4 kilometres of pipe (23%) that is past its use by date.

The useful life (service life) of the pipe assets has been reassessed in recent times based on a detailed study of the in-service life of these assets for this District¹⁶. It is this in-service useful life combined with the age of the asset that has determined the level of deferred renewals.

Table: Deferred Renewals and Renewals within Infrastructure Strategy Time Frame.

LEGEND:

Deferred renewals - requires addressing

Renew within term of Infrastructure Strategy

Renew after Infrastructure Strategy

Sum of Quantity/Length	Column Labels				Comment
Row Labels	Beyond 30 Years	Deferred, Renew Now	Within 30 Years	Grand Total	
Ahaura	0.87			0.87	Part of Water Supply Private Community Scheme
Blackball	10,938.90	427.70	777.91	12,144.51	Blackball Scheme
Blaketown	5,313.56	1,841.75	3,544.47	10,699.78	Greymouth Scheme
Cobden	10,473.54	2,870.66	6,970.21	20,314.41	Greymouth Scheme
DOBSON URBAN	2.55			2.55	Greymouth Scheme
Dobson/Taylorville	8,618.06	6,678.05	2,227.08	17,523.19	Greymouth Scheme
Greymouth	45,221.89	12,837.09	11,186.30	69,245.28	Greymouth Scheme
Iveagh_Bay	38.14			38.14	For public toilets only
Karoro	10,670.57	2,094.19	2,415.55	15,180.31	Greymouth Scheme
Moana	1,322.84			1,322.84	Pipes only now Scheme
RAPAHOE	23.00			23.00	Runanga-Rapahoe Scheme
Runanga	14,986.90	20,179.85	1,263.02	36,429.77	Runanga-Rapahoe Scheme
Rural	3,551.00		19.77	3,570.77	Greymouth Scheme
South_Beach/Paroa	16,637.35		14.04	16,651.39	Greymouth Scheme
Stillwater	3,168.90	475.88	815.87	4,460.65	Greymouth Scheme

¹⁶ Rob Dewhirst Consulting Limited *Prioritisation Strategy for Pipe Replacement based on Criticality and Condition*, February 2018.

Grand Total	130,968.07	47,405.17	29,234.22	207,607.46	
% Total Length	63%	23%	14%		

The following maps provide a good picture of the level of renewals required for this activity.

LEGEND:

Deferred renewals - requires addressing

Renew within term of Infrastructure Strategy

Renew after Infrastructure Strategy

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Figure: Map of Deferred Renewals and Renewals within Infrastructure Strategy Time Frame – Greymouth and Cobden



Figure: Map of Deferred Renewals and Renewals within Infrastructure Strategy Time Frame – Runanga and Dunollie

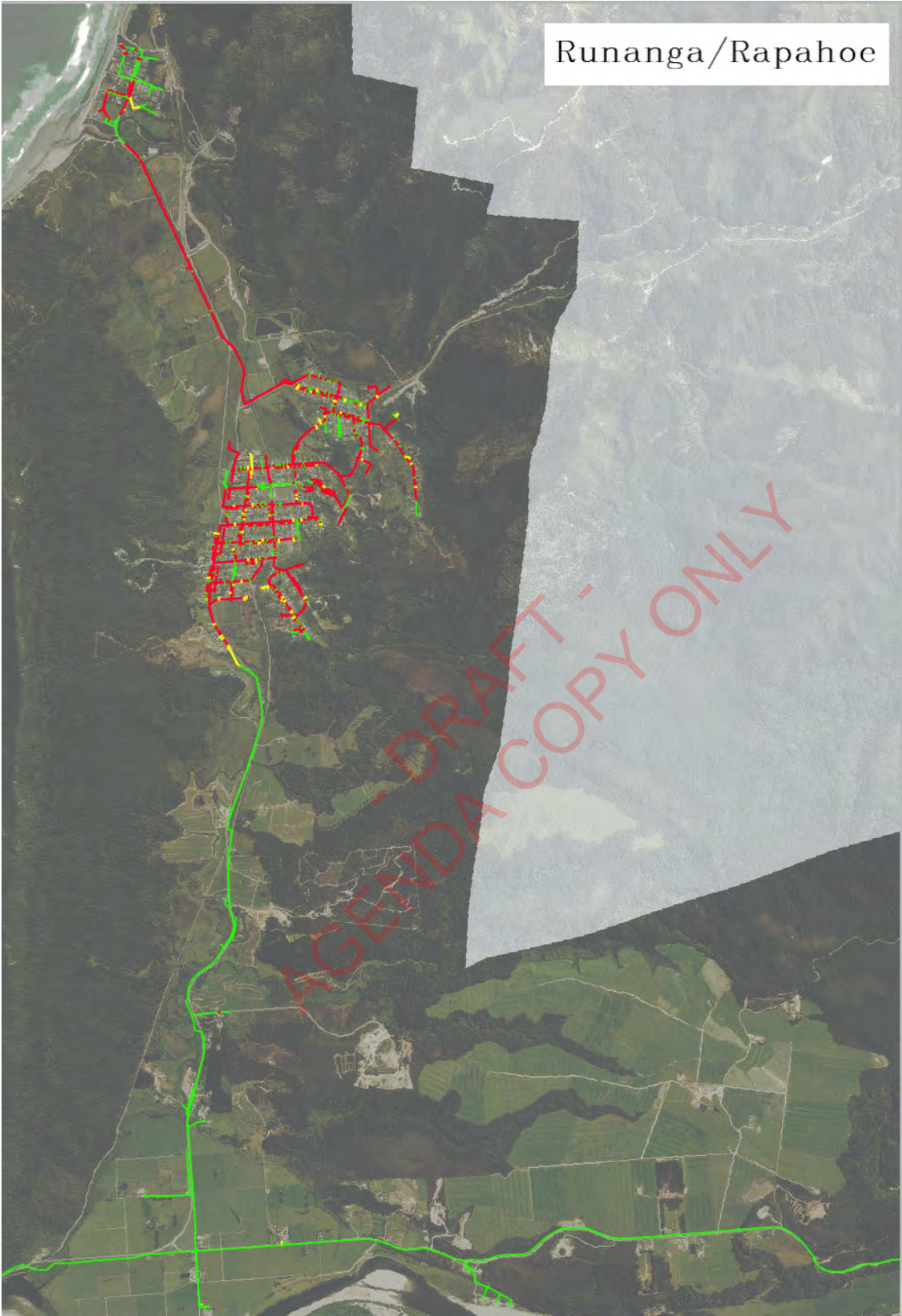
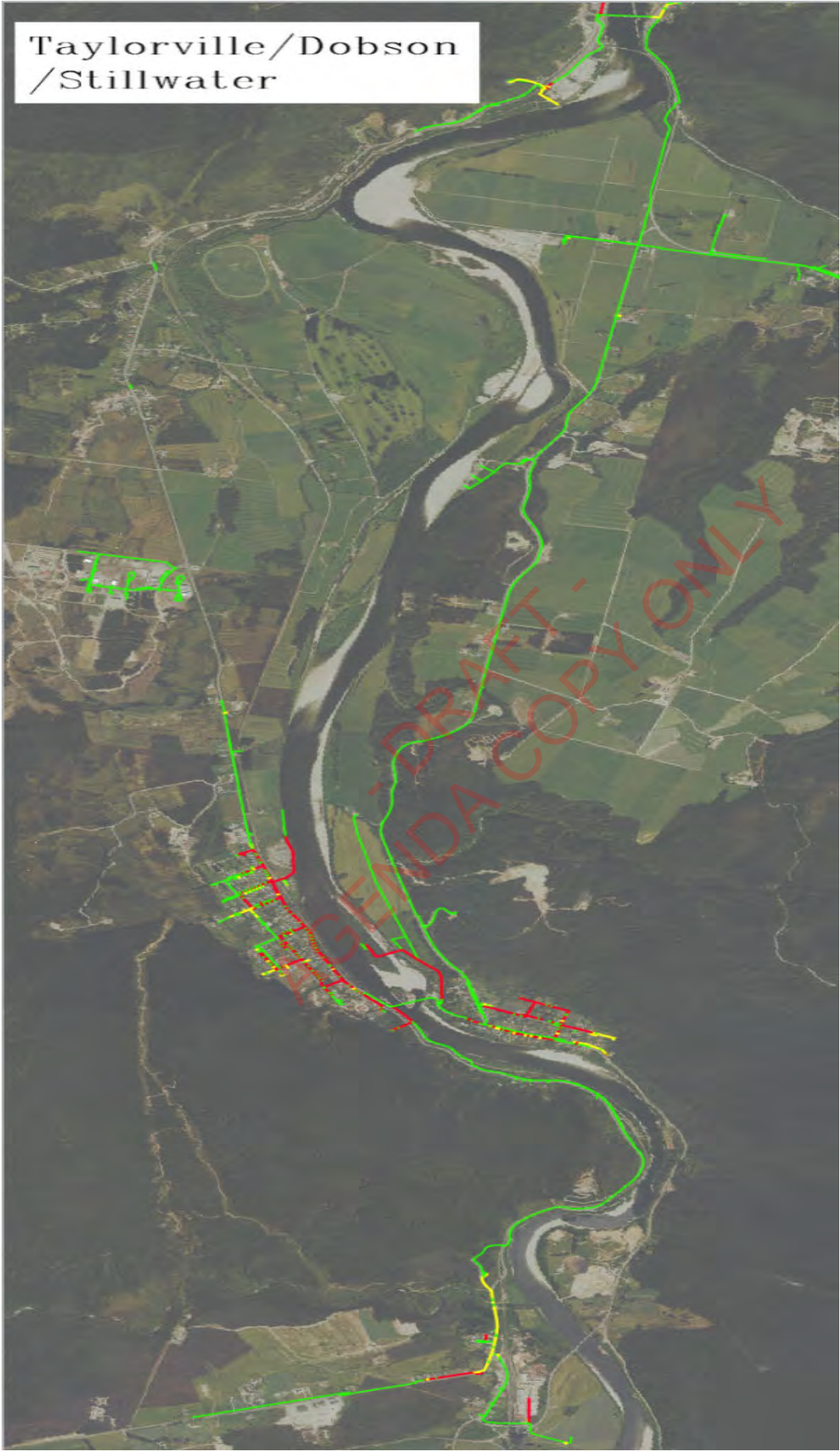


Figure: Map of Deferred Renewals and Renewals within Infrastructure Strategy Time Frame – Taylorville and Dobson



The purpose of Council's renewal strategy is to ensure that:

- Replacement of assets is carried out at the most appropriate time
- The most effective benefit is received from any asset renewal
- Renewals assist with compliance with water supply levels of service

Over the period of this LTP, the Council will use information from condition assessments to carry out renewal works on a prioritisation basis, in order to maintain levels of service and avoid potential critical failures. A significant boost for this work is proposed for year 1 of the LTP, with plans to undertake renewal work in two areas in Greymouth using funding from the three waters review stimulus fund.

Increases in Drinking Water Standards

Both environmental and drinking water regulations are subject to an upcoming period of change, as outlined in the sections above. Upgrades may be required to our existing treatment plants if they do not meet current or new (higher) standards. This may include changes in resource consent or drinking water standards.

Any upgrades will be investigated if required. No funding has been allowed for in present budgets for such upgrades.

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4. The Journey

4.1 Plans for the Future and Key Projects

Over the next ten years, management of water supply services will continue to involve the following:

- Managing and maintaining the network so water is constantly available on demand and is delivered at an appropriate quality (colour and taste) and quantity (pressure and flow) (in part to meet firefighting requirements).
- Responding promptly to fix all faults.
- Detecting and fixing leaks, and installing water meters for large commercial water users and water meter readings.
- Planning and carrying out renewals to replace assets in a timely manner.
- Monitoring water quality to ensure it meets the required standard and is not contaminated or presenting a health risk.
- Planning to respond to emergency events that may damage the network, such as earthquakes. We often refer to this as Lifelines Planning, as lifelines are critical services that will be needed during an emergency event.
- Forward planning to ensure future demand can be met, taking into account anticipated growth and other factors such as climate change impacts.

As well as these ongoing requirements, the Council also plans to undertake a number of key projects. These are set out below.

At the time of writing, the first four projects in the below table are planned commence prior to Year1, ie during the 2020/21 year, but will be ongoing/completed during the period covered by this AMP. These are works for which funding is presently being sought from the three waters review stimulus fund.

Project/programme	Details	Estimated Cost \$000's)	When
Greymouth reservoir renewal/upgrade	Replace the Greymouth reservoir with two new reservoirs at Puketahi St, Greymouth.	2,700	Year 1
SCADA telemetry for the Three Waters networks	Equipment renewal and upgrade programme for Surveillance Control and Data Acquisition system (SCADA) to provide essential management and monitoring information on our three waters (water supply, wastewater and stormwater). Ongoing operational costs thereafter (licences, resources). Funded by DIA – Year 1 then extra \$25K over current budget from Y3	100 Y1 Extra \$25 Y3	Year 1 \$100, then extra \$25, onwards from Year 3
Reticulation renewals	A one-off funding boost to address the areas prioritised for renewals. Funded by DIA	440	Year 1
Additional bore, Greymouth water supply	Construct and commission a fourth bore in the Grey River to improve capacity and resilience of the Greymouth water supply.	250	Year 1
Chlorine residuals, Greymouth	Removal of chlorine residuals, Greymouth water supply.	100	Year 4 onwards

Project/programme	Details	Estimated Cost \$000's)	When
Leak detection	One-off lump sum boost to this programme. Water leak detection informs our renewals programme, and fixing leaks reduces required storage capacity and wastage of water.	102	Year 1-2
New water supply scheme, Moana – signalled for next LTP ¹⁷	Consideration and development of new reticulated water supply for Moana, depending on future growth.	2,000	Years 4-10
Extension of Karoro Scheme to Gladstone-Camersons Area	Feasibility study Year 1 and works Year 4 \$50K in water supplies and \$50k in waste water	100 (Year 1) 3,500 (Year 4)	Year 1 and Year 4
Development of Blackball scheme – signalled for next LTP	Increase capacity of Blackball scheme, depending on future growth/tourism recovery.	500	Years 4-10
New main, Dobson/Kaiata – signalled for next LTP	Install a new link main along State Highway 7, Dobson/Kaiata, to increase resilience	300	Year 4

Further details on the operation and funding of these activities are outlined in the sections below.

New capital works and upgrades to the capacity of existing systems will also be considered by Council where there is a demonstrated need, for example to address environmental, public health, fire fighting risk or other concerns.

4.2 Lifecycle management

Council manages the life cycle of its water supply 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. This involves anticipating and managing risks and optimising decision making throughout the life of the assets. The lifecycle of an asset follows the progression shown below.

Planning	The process of anticipating a need for new asset driven by growth, a need to meet a higher standard of service, or to replace an existing failing asset. The planning process involves engineering evaluation and community engagement to size, locate, programme and consider the design options, whole of life costs, non-asset alternatives and risks.
Creation	The purchase, construction or vesting of an asset to the Council. The management of the design and construction to ensure the required quality is delivered on time and at the agreed cost.

¹⁷ Would be subject to consultation in 2024 LTP

Operation & Maintenance	The day to day running of the infrastructure to ensure continual and cost effective service. The process involves proactive and reactive repair and servicing of the assets, taking into account the 'criticality' of the assets to the overall service.
Condition & Performance Monitoring	Regular, ad hoc and opportunistic assessment of the condition and performance of assets in relation to manufacturers' specifications. Projection of assessments using local and national experience to estimate life expectancy of assets.
Rehabilitation	Proactive restoration of existing assets to extend the serviceability and life expectancy in a cost effective manner.
Renewal	The replacement of assets that have reached the end of their useful lives.
Disposal	The removal of redundant assets by decommissioning, physical removal, sale or re-utilisation for different purpose/activity.

Effectively this activity management plan in total encompasses the approach to how Council manages the lifecycle of the activity and assets associated with the activity in order to continue to provide the service.

The approach taken to developing our AMPs is life cycle asset management. This approach...'*Encompasses all asset management (AM) strategies and practices associated with an asset or group of assets that results in the lowest lifecycle costs. And lifecycle cost is the total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.*'¹⁸

The approach is portrayed in the figure below and includes looking at the lowest long-term costs (rather than short-term savings) when making asset management decisions.

Whilst this is the desired approach, Council is also constrained by affordability as is discussed in the Infrastructure Strategy and Financial Strategy sections of the LTP. Council has to consider all its desired objectives across all its activities when it prepares its budgets. Realistically, for instance, optimal levels of funding for renewals cannot always be achieved.

Over the long term, Council's aim is to achieve lowest long term costs. However it has to, as a trade-off across all its activities, accept higher risks and, for instance, increase operational and maintenance costs while it works towards achieving lowest long-term costs.

¹⁸ International Infrastructure Management Manual 2015



Useful life

The Council has made a number of assumptions about the useful lives of its assets by assessing condition using the age, material, industry and local knowledge. The detail for each asset category is reflected in the statement of accounting policies in the LTP. We have also incorporated factual data obtained from the detailed condition assessments, which have been carried out.

The useful lives (also known as Base Life) are consistent with the assumptions applied to valuing each asset category. Further details are provided in the recently completed valuation for this activity to the 30 June 2020.

Useful lives are shown in the table below.

Asset Class and Asset Type	Min of BaseLife	Average of BaseLife	Max of BaseLife
ws_line			
Pipe Main	40	79	90
Rider Main	40	78	90
Rising Main	40	81	90
Service	40	75	90
ws_plant			
1 Micron cyst rated Cartridge Filter	15	15	15
1 Micron Standard Cartridge Filter	15	15	15
Aeration Structure	90	90	90
Backflow Preventer	30	30	30
Bore Pumps	20	20	20
Building Structure	50	82	100
Cable/Rope	30	30	30
Chemical Correction Equipment	50	50	50
Control Tanks/Structure	90	90	90
Disinfection Equipment	30	30	30
Disinfection Holding Tank/Structure	90	90	90
Earthworks/Foundation	80	185	500

Electrics and Controls	20	27	30
Fences	40	48	50
Generator	30	37	40
High Pressure Pumps	20	24	30
Impermeable Liner	40	40	40
Intake Structure	70	70	70
Land	500	500	500
Lime Batch Feeder	25	25	25
Low Pressure Pumps	20	29	30
Monitoring Equipment	30	30	30
Pipes and Valves	30	34	80
Pressure Reducing Valve	30	30	30
Radio Communications	30	30	30
Reservior Liner	30	30	30
Reservior Structure	60	74	80
Solar Power Systems	30	30	30
Tower	80	80	80
Water Loss Valves	20	29	30
ws_point			
Air Release Valve	25	28	30
Backflow Preventer	25	28	30
Blank Cap	80	89	90
Filter	10	10	10
Fire Hydrant	25	30	30
Fountain	60	60	60
Manhole	80	88	90
Meter	20	21	30
Tap	10	30	30
Treatment Station	30	30	30
Valve	25	29	60

4.3 Maintenance and operation approach

Given the high level of uncertainty around the Three Waters Reforms, the Council is proceeding on the assumption that it will continue to own, control and manage all of the public systems over the period of the LTP. The work of operating and maintaining the physical systems is contracted out, typically for 5 year contracts.

The contractor is required to operate and maintain the assets to achieve specified outcomes and ensure they provide the required levels of service. This is currently a negotiated contract.

The contract is performance based with a focus on forward programming, preventative maintenance and reporting, however, there are certain minimum standards. Contract works must be carried out to an acceptable standard, at the least cost, with minimum disruption to the community and the environment.

Major renewals or new capital works are also contracted out via tender.

Details of Councils current service providers and the terms of contracts are detailed in the following table:

Service Type	Service Area	Further Details	Service Provider	Contract commenced	Contract expires	Contract Features
General Maintenance and Operations	All water supply schemes outlined in this AMP	Utilities Contract	Paul Smith Earthmoving 2002 Ltd	1 October 2018	30 June 2022 with 1 Year plus 1 Year	Maximum Term 5 years and 9 months

4.4 Asset valuations

In summary the overall valuation of assets is presented in the following tables.

Table: Overview of Asset Values

Asset Component	Replacement Cost (\$M)	Percentage Total Cost	Current Value (\$M)	Annual Depreciation (\$M)
Pipes	47.09	72%	26.19	0.59
Treatment Plants	13.23	20%	6.19	0.25
Points - Valves, Fire Hydrants, etc	5.52	8%	2.29	0.16
Total Value	65.84	100%	34.67	1.00

Peer reviewed and Audited Valuation to 30 June 2020.

Key:

- Plant includes intake facilities, treatment equipment, control panels, pumping systems, buildings and storage reservoirs.
- Pipes include the main water supply lines generally running along and under roads and the short pipes from the main water supply lines running along and under the roads to property boundaries
- Points etc., are essentially the service connections between the pipes such as street valves and fire hydrants. Points include the toby taps and where fitted, water meters at property boundaries.
- "Replacement Cost" means optimized replacement value
- "Current Value" means optimized depreciated replacement value (that is the current Book Value)
- "Annual Depreciation" means the annual depreciated applied to the asset which is the replacement value divided by the useful life of the asset and is the amount the amount of value the asset loses each year.

Value of Assets by Community

Table: Value of Assets by Community

Community	Replacement Cost (\$M)	Percentage of Total Cost	Current Value (\$M)	Annual Depreciation (\$M)
Ahaura	0.01	0%	0.01	0.00
Blackball	3.46	5%	2.44	0.06
Blaketown	2.30	3%	0.82	0.03
Cobden	4.58	7%	1.85	0.06
DOBSON URBAN	0.00	0%	0.00	0.00
Dobson/ Taylorville	5.10	8%	2.54	0.09
Greymouth	28.24	43%	13.87	0.41

Iveagh_Bay	0.01	0%	0.01	0.00
Karoro	3.43	5%	2.04	0.05
Moana	0.30	0%	0.23	0.00
RAPAHOE	0.00	0%	0.00	0.00
Runanga	11.95	18%	6.28	0.19
Rural	0.76	1%	0.71	0.01
SOUTH BEACH	0.00	0%	0.00	0.00
South Beach/ Paroa	4.31	7%	3.18	0.06
Stillwater	1.40	2%	0.70	0.03
Total Value	65.84	100%	34.67	1.00

The following table provides information on the average age of the assets in each community. The average useful life of the assets in each community is determined by dividing the replacement value by the annual depreciation. The remaining useful life is determined by dividing the current value (depreciated replacement value) by the annual depreciation. The age of the assets in each community is therefore the useful life minus the remaining useful life. The replacement cost in each community is included in this table as it gives an indication of the total value assets provided and how old on average the assets are in each community.

Community	Replacement Cost (\$M)	Average Useful Life	Remaining Useful Life	Age
Ahaura	0.01	26	25	1
Blackball	3.46	60	42	18
Blaketown	2.30	69	25	45
Cobden	4.58	73	30	44
DOBSON URBAN	0.00	27	13	14
Dobson/Taylorville	5.10	59	30	30
Greymouth	28.24	69	34	35
Iveagh_Bay	0.01	90	74	16
Karoro	3.43	66	39	27
Moana	0.30	70	54	16
RAPAHOE	0.00	58	57	1
Runanga	11.95	62	32	29
Rural	0.76	82	77	5
SOUTH BEACH	0.00	43	3	40
South_Beach/Paroa	4.31	70	52	18
Stillwater	1.40	56	28	28
Total Value	65.84	66	35	31

4.5 Sustainability

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

Environmental sustainability is considered with respect to Council's District Plan, and other statutory planning instruments such as the Regional Policy Statement and Regional Plans. Communities and stakeholders have the opportunity to influence these policies and plans through initial preparation of the plans and policies and subsequent reviews. Individuals, groups and organisations also have the opportunity to initiate changes to these planning documents.

The governing legislation relating to development in New Zealand is the Resource Management Act 1991 (RMA). Individuals, groups and organisations are able to pursue initiatives that meet the purpose and principles of this Act. As well as enabling opportunities for development initiatives, land and facilities can be designated for the public good, such as sites for essential services such as water supply treatment facilities.

From a purely infrastructure servicing perspective, developments that are grouped in and around existing built-up areas are more effective and efficient than creating less dense and/or isolated developments. Conversely where people are prepared to pay the higher capital costs for onsite services or small collective schemes, these options can also be provided for less dense and/or isolated developments, provided that any water takes meet the purpose and principles of the RMA.

Encouraging infill development and "urban" renewal rather than consuming land that is in or potentially available for economically viable agricultural production is also likely to contribute to the sustainability of development. Conversely, utilising land for residential development with appropriate safeguards where the land does not have any other potential use may reduce pressures on economically viable agricultural land.

That said, it needs to be noted that approximately 65 to 70% of the District land area is in some form of Crown ownership. This does mean that there are pressures on the remaining 30 to 35%. However the density of development is not high given the low population base, which means that at least within the term of this Plan (10 years) pressures on the land available for development are not likely to be high.

Another sustainable development issue, albeit one now more likely to be long rather than short term, is that hand in hand with the traditional economic bases of the district such as mining, farming, forestry and fishing, tourism (following recovery from the global pandemic) may continue to increase as per its pre-Covid trajectory.

One of the reasons for this is that so much of the District has been retained in its natural state and beauty. Council is conscious of the need for balance between development pressures and the need to ensure the District remains into the future an attractive place to live, work, visit and play.

In relation to water supply management and planning, the focus of Council is on long-term sustainability.

Specific focus areas are:

- Minimising any adverse effects of water takes or maintenance and operations and respecting Māori relationships with water.
- Continuing to improve the robustness and accuracy of Council data, processes and systems in order to provide for better decision-making.
- Continuous planning of improved service delivery and also new services in outlying areas.
- Ensuring adequate maintenance to networks and treatment plants, including leak detection and renewals to avoid wastage/ inefficient use of water.
- Competitively tendering works to ensure value for money.
- Continuing to monitor and consider solutions to actual or potential coastal erosion where Council infrastructure is at risk.
- Continuing to monitor and consider solutions to actual or potential other climate change effects which may impact on water supplies.

Section	Simply Sustainable business model (Ministry for Environment)	Grey District Sewer schemes ("Business")
A	The Simply Sustainable business model illustrates an evolution in the business cycle. To begin with natural resources are used by Suppliers and turned into products. As part of this manufacturing process waste is generated and put into the Environment.	<p>Water is taken from watercourses or below ground. Water permits and discharge permits from the regional council for resource take and discharges confirms water take and discharges are sustainable or if there are any issues. Human waste and grey water (raw effluent) is collected by gravity system or pressurized mains and transferred to wastewater treatment plants where it is treated and discharged back into the environment.</p> <p>Energy is used to pump and treat water and effluent is optimized to use energy efficiently. For instance for water supplies, pump at night and store water in reservoir. Reservoir gravity feeds townships avoiding extra pumping costs.</p> <p>Where water supply schemes exist (see details above in this AMP) water that is used by the community is discharged into a Council supplied sewerage scheme, with the exception of:</p> <ul style="list-style-type: none"> ▪ Nelson Creek – community owned water supply – effluent discharged to septic tanks ▪ Ahaura – community owned water supply – effluent discharged to septic tanks ▪ Taylorville – collected and transferred for treatment at the Greymouth waste water treatment plant. ▪ Dobson and Kaiata Township – collected and transferred for treatment at the Greymouth waste water treatment plant. ▪ Stillwater – discharged to on property site septic tanks ▪ Rapahoe – discharged to on property site septic tanks ▪ Greymouth (including Blaketown and Cobden) – 90% of combined sewage and stormwater pipes in streets separated, 45% properties separated. Council policy to carryout separation works on properties and recover costs if property owners do not voluntarily separate. Separated sewage pipes for township allows sewage to be collected and pumped to Greymouth
A - continued	The Simply Sustainable business model illustrates an evolution in the business cycle. To begin with natural resources are used by Suppliers and turned into products. As part of this manufacturing process waste is generated and put into the Environment.	<p>To complete the sustainability cycle sewerage schemes in place to treat effluent prior to discharge back onto the environment located at:</p> <ul style="list-style-type: none"> ▪ Karoro (includes South Beach and Paroa area) ▪ Runanga ▪ Moana (no reticulated water supply) ▪ Blackball ▪ Cobden ▪ Greymouth ▪ Te Kinga. (no reticulated water supply) ▪ Kaiata Township and Kaiata Park (pending) <p>Resource consent in place for sewerage scheme approved by District and regional council confirms discharge is sustainable. Water loss – programs in place and through this Plan being enhanced to monitor water loss, repair, replace pipes when water loss excessive.</p>

Section	Simply Sustainable business model (Ministry for Environment)	Grey District Sewer schemes ("Business")
B	These products are purchased as Resources by Businesses who use them to create Goods and Services, which are then sold to Customers. Businesses generate waste in their processes and customers to put their waste into the environment.	Domestic and commercial fees are charged for sewage collection. Domestic consumers charged a targeted rate as consumption is considered by Council to be low compared with commercial users. Additional rates apply to some commercial users. Extra volume charges are applied to hotels, motels and schools. This provides an economic incentive to optimize their water use. Trade Waste Bylaw adopted by Council and any commercial/industrial premises deemed to be a trade waste producer charged trade waste levies. The Trade Waste levee is used to create an incentive to reduce water and water trade waste usage.
C	At this point the model changes. It now shows the customer completing the cycle back to the supplier. By sending Recyclables back to suppliers, material is reused to make new products - meaning the supplier takes fewer natural resources.	See response to Section A. Effluent including water is treated and recycled back into the environment.
D	Suppliers and businesses then take further steps towards becoming sustainable by examining their Strategy, Processes, People and Capital. Developing sustainable and efficient business practices improves efficiency even further.	See response to Section A. All these aspects are required to be considered through Council's Long Term Plan, Annual Plans, Activity Management Plans, Funding Policies, and Water Service Reviews.
E	Businesses can become more sustainable by choosing more sustainable suppliers, and also by looking at their Strategy, Processes, People and Capital. Their waste going into the environment will also reduce.	See response to previous sections. Council competitively re-tenders operations and maintenance contracts every 3 to 5 years. Renewal and capital works competitively tendered. Council has determined that competitively tender works and services ensures efficiency and thereby reduces waste. Increasing emphasis on sustainable business practices as contracts are reviewed and retendered.
F	The model then places this business cycle in the wider context of Society. In this broader context, businesses interact with Shareholders, the Community and Government to further develop sustainability.	See response to Section D. Strong links to Society, Businesses and Shareholders (Water Users), Community and Government through legislation requirements including but not limited to need to consult with all stakeholders on the preparation and adoption of long term plans for this "business".

The above environmental sustainability model establishes a model for good practice. However in order for any business to survive it must continue to have a customer base. Economic sustainability is addressed elsewhere in this AMP and in the LTP.

4.6 Environmental management issues

Impacts on the natural environment of managing the water supplies activity are dealt with under the Resource Management Act 1991 (RMA). Ensuring that all necessary resource consents are applied for and granted in a timely fashion is a critical part of this activity. Where required by resource consent conditions, Council is required to monitor the environmental impacts of its activities.

There are a number of activities that may have potential and/or actual effects on the environment. The most significant in terms of requiring resource consent or permits are:

- Taking of water from rivers or from underground sources.
- Land disturbance and earthworks.
- Land activity.

Other factors may also need to be considered such as the siting of new reservoirs (visual impact) and pump stations (visual and noise effects).

There are a number of resource management plans that cover the Grey District and impact on this activity:

- The West Coast Regional Council's Plans are concerned with the discharge of contaminants onto and into land, water and air; water permits, coastal permits, and land use consents.
- The Grey District Plan is concerned with land use and development, including residential and development zoning.

It is noted that Council by law is a requiring authority and is also a network utility operator. If necessary it can designate and acquire land for a public good purpose. The RMA recognises that this activity has a public good purpose.

Resource Consents

A very important aspect of the water supply schemes is to ensure that they comply with resource consent conditions, to meet the purpose and principles of the RMA.

Water permits are in place for all water supplies. Council expects to be able to continue to comply with consent conditions imposed and does not foresee any undue issues in renewing consents under current standards.

Council's significant resource consents held in relation to its water supplies are as follows:

consent no.	Community	type of consent	purpose	status	original expiry/ completion date
RC01180/3	Blackball	Water Permit	To take surface water from Blackball Creek for the purpose of providing a community water supply for Blackball.	granted	15/10/2034
RC01180/3	Blackball	Water Permit	To take surface water from the Blackball Creek for the purpose of providing a community water supply for Blackball.	granted	8/01/2037
RC10157/1	Dobson-Taylorville	Water Permit ¹⁹	Dobson/Taylorville/Stillwater/Kaiata public water supply	granted	18/11/2045
RC01180/1	Greymouth	Water Permit	To take surface water from the Grey River at Omoto from the purpose of providing a lifeline water supply for Greymouth	granted	15/10/2034
RC00244/1	Greymouth	Land Use Consent*	To disturb the bed of the Grey River for the purpose of removing built up material from the area surrounding the Greymouth Water Supply Intake, carrying out 2 channel cuts to improve flushing of salt water from the area immediately adjacent to the water intake and for maintenance of the works.	granted	21/08/2035
RC01092/1	Greymouth	Land Use Consent	To install and maintain a new water supply intake structure in the bed of the Grey River and for associated disturbance.	granted	11/07/2036
RC01092/2	Greymouth	Land Use Consent	For earthworks associated with installing and maintaining a pipeline from the bed of the Grey River to Taylorville Road and	granted	11/07/2036

¹⁹ Will be retained as emergency supply under Greater Greymouth Water Safety Plan.

consent no.	Community	type of consent	purpose	status	original expiry/ completion date
			excavating foundations for a high-lift pumping station.		
RC01092/3	Greymouth	Water Permit	To take groundwater from the Grey River via a subsurface infiltration system.	granted	11/07/2036
RC01092/4	Greymouth	Land Use Consent	To install and maintain a water supply pipeline beneath the bed of Coal Creek and for associated disturbance.	granted	24/07/2036
RC01092/5	Greymouth	Land Use Consent	For earthworks associated with installing a water supply pipeline along the Taylorville Road and for ongoing maintenance.	granted	24/07/2036
RC01180/1	Greymouth	Water Permit	To take surface water from the Grey River at Omoto for the purpose of providing a lifeline water supply for Greymouth.	granted	8/01/2037
RC02075/1	Greymouth	Land Use Consent	Earthworks for the construction and maintenance of a reservoir and pipeline and associated disturbance, at South Beach	granted	20/09/2037
RC01180/2	Runanga	Water Permit	To take ground water at Coal Creek for the purpose of providing a community water supply for Runanga.	granted	15/10/2034
RC01180/2	Runanga	Water Permit	To take ground water at Coal Creek for the purpose of providing a community water supply at Runanga.	granted	8/01/2037
RCN94482	Stillwater	Water Permit*	Take groundwater for Stillwater town supply	granted	7/11/2029

* Consents that are likely to be surrendered as no longer required with the next 10 years.

There may be other resource consents required for works associated with any new extensions of water supply schemes and/or other proposed projects during the term of this AMP, for instance an additional intake bore at Coal Creek for the Greymouth Scheme. The requirement for consents will be assessed in detail as part of the initial review and planning for any project.

Should there be any new privately developed subdivision infrastructure developed over the life of this AMP, it is likely that Council would inherit a number of consents if/when that new infrastructure is transferred to Council. This is why it is important that Council agrees to conditions imposed on resource consents obtained by developers for assets to be vested in Council, as Council accepts the long term responsibility for compliance with these permits.

Environmental Monitoring and Reporting

Environmental monitoring is carried out in accordance with the requirements of Council's resource consents. The extent to which the Council has been able to meet the conditions of each permit is reported in its Annual Report each year.

There are no known resource consent issues with respect to this activity.

Anticipated Environmental Results	Monitoring and Review Data
<ul style="list-style-type: none"> Refer conditions of resource consents. 	<ul style="list-style-type: none"> No issues identified at this stage.

Designations

Designations enable central and local government to get planning authorisation for public works and to protect land for future public works. A designation is a form of 'spot zoning' over a site, area or route identified in the District Plan. The 'spot zoning' authorises the requiring authority's (in this case, the Council's) work and activity on the designated area without the need for a land use consent under the RMA.

There are no specific designations in place for this Activity. However many components of this Activity exist over, through and under roads which are designated. All existing formed and unformed roads within the District are designated in accordance with the District Plan.

While no designations exist at present, Council intends to consider designating various components of this activity that are not indirectly covered by road designations²⁰ such as:

- Water intake areas
- Water storage areas and reservoir sites
- Water treatment plant sites
- Pipe networks connecting the above facilities.
- Pipe networks from the above facilities that are not indirectly protected by road designations.

Any new designations may be incorporated at the time Council reviews its District Plan as part of the combined *Te Tai O Poutini* District Plan process. The legislation allows this approach to be taken by Council as the Requiring Authority.

Zoning

Zones, known as Environmental Areas, are detailed in the Council's District Plan and their extent and location is shown on the District Plan maps. These zones are important as they can change over time through subdivision.

The following zones are included in Section 2.5 of the District Plan:

Environmental Area (Zone)	Community Areas
Residential:	Greymouth, Karoro, Paroa, Runanga, Cobden, Blackball, Kaiata, Mitchells, Iveagh Bay, Moana, Dobson, Punakaiki, Boddytown, Sumner Road, and Blaketown.
Township:	Camerons, Nelson Creek, Ahaura, Ngahere, Stillwater, Taylorville, Gladstone, Rapahoe, Barrytown, Totara Flat, and Blackball.
Rural-Residential:	Golden Sands, parts of Dobson, Blackball and Paroa.
Commercial/Industrial:	Stillwater, Greymouth, Cobden, Runanga, Rapahoe, Blaketown, Karoro, Paroa, Gladstone, Kaiata, Dobson, Ngahere, Moana, and Mitchells.
Rural:	All that area not previously mentioned.

The District Plan states: *"Each of the management areas generally contains similar natural and physical resources which make each area distinct from one another. Essentially as you move between those areas the performance standards vary, i.e. from the more stringent residential standards to the more flexible Commercial/ Industrial standards."*

²⁰ Generally pipelines do not need designated sites as they are mainly laid within road reserve. Legislation allows pipelines to be laid in roads as well as other network lines such as telecommunications and power. The only requirement is the approval of the Road Controlling Authority as to location, depth of services and installation standard.

The bulk of the components relating to this activity are located in residential, township and commercial/industrial zones. Exceptions are intake and water treatment/storage facilities which are generally located in rural zones.

These Environmental Areas are presently being reviewed as part of the combined *Te Tai O Poutini* District Plan process. The review will likely result in changes to some of the zones over the latter period of the LTP.

Purchase of Additional Land

The following items have been identified as requiring possible land purchase during the planning period:

Scheme	Reason
Dobson-Taylorville Scheme	Current lease arrangements for existing facilities on land not owned by Council may need to be reviewed. The Brunner Water Supply intakes and plant are being maintained as an emergency intake/supply via the WSP.
Moana Scheme (may be considered in latter half of the LTP period at community request)	Land may need to be purchased or leased to allow occupancy of water supply infrastructure. If considered included in next LTP.
Gladstone and Camerons	Land may be needed to purchase or lease to allow occupancy of water supply infrastructure. If considered included in next LTP.

Construction of Works on Private Land

Refer table above. It is noted that Council is currently seeking the purchase of private and government agency land for the siting of new reservoirs for Greymouth in the 2020/21 year.

Property Easements

Property easements (Rights to Convey Water through Private Property) are in place where public water supply lines cross private land. Information on the location of these pipes is shown on Council's AssetFinda and Geographical Information Systems.

Water supply pipelines do exist which are not covered by easement across private land. This is because up until a change of legislation, Councils had a legal right to install infrastructure on private land without easements. Recent legal advice is that this infrastructure is entitled to remain on the private land and the original landowner approval carries forward to subsequent landowners. However, if Council does become aware of any such situations, negotiations are initiated with the landowner to protect the pipeline by way of a property easement.

The same comments apply for water supply plant with the exception of intake areas on or adjacent to rivers. Councils in the past had certain rights to take water. Council is progressively future protecting these areas through license to occupy agreements with Land Information New Zealand, who administer Crown Land such as river beds.

Council has a right to occupy agreement for Motutapu Island (Brunner Island) in the Grey River – this lease is under review as to whether it needs to be renewed as the water intake for this scheme is now part of the Greymouth Scheme with the intakes in the Coal Creek area.

Potential Issues and Future Actions

Issues

Refer also to Section 3.8 above.

Increasingly, the efficient use of water and monitoring of its management has become a focus of central and local government. The Council has identified leak detection and remediation as an important issue and is proposing steps to renew its networks where this is required. It is also planning increased improvements in monitoring systems through investment in SCADA telemetry. This information will help to ensure issues in the networks are detected, wastage is reduced and water is used efficiently.

Ongoing monitoring of compliance with drinking water standards and conditions of resource consents is carried out. Issues relating to public health are outlined in Section 2.1. The only potential environmental issues are:

- Council may need to vary its resource consent to take additional raw water at Coal Creek for the Greymouth Scheme.
- If Runanga continues to be supplied from a separate intake at Sids Road, a variation to the existing consent will be required to increase the volume of water taken.

Future Action and Improvements

In relation to increasing expectations around water quality improvements and standards, the Council will continue to monitor regulatory changes and plan for any required improvements.

Environmental Management - Future actions and improvements:

What needs to be done	By Who	By When
Check annually for any other consents, e.g. transferred as part of subdivisions	Utilities Team Leader	End of January each year
Review annually in detail environmental performance of all consented sites as per consent condition requirements and report on any immediate and future actions that Council may need to take.	Utilities Team Leader	End of January each year or by due date specified in the resource consents.
Update annually list of consents designations and easements held by Council	Utilities Team Leader	End of January each year
Apply for variation to the water take for Runanga to increase the volume if it remains as a stand alone scheme. Note: May not be needed. Plant operates within the existing take consent limits, however if the plant was asked to pump into the Greymouth Supply, full capacity of the plant would exceed the current consented take. This is only likely to occur during emergency events though.	Utilities Team Leader	To be confirmed.

5. Measuring Our Success

5.1 Performance measures

What we're measuring	How we'll measure	Target				
		Current Performance (2019/2020)	Year 1 (2021/2022)	Years 2 – 3 (2022/2023 & 2023/2024)	Years 4 – 10 (2024/2025 to 2030/2031)	Target Trend (years 1-10)
Customer satisfaction	% of residents are satisfied with water supply service (where available)	57%	57%	58%	60%	Improving
	Maximum number of complaints received about water clarity, taste, odour, pressure/flow, continuity of supply or Council's response to reported issues (per 1,000 water supply connections) Number of rated properties: 5,140	Total complaints: 217 Per 1,000 properties: 46	Total complaints: 147	Total complaints: 133	Total complaints: 123	Improving (decreasing complaints)
Council is providing a reliable, efficient and safe water supply	Maximum number of notifiable water supply transgressions with Drinking Water Standards per year: <ul style="list-style-type: none"> Greymouth (now includes Taylorville/Dobson/Stillwater) Blackball Runanga/Rapahoe* <i>Assumes the Runanga/Rapahoe supply will become or remain a chlorinated supply</i>	<ul style="list-style-type: none"> NIL NIL NIL 	<ul style="list-style-type: none"> Nil Nil NIL 	<ul style="list-style-type: none"> Nil Nil NIL 	<ul style="list-style-type: none"> Nil Nil NIL 	No Change
	Maximum % of real water loss from reticulation system (water loss measured from the reservoirs at least once per year): <ul style="list-style-type: none"> Greymouth (now includes Taylorville/Dobson/Stillwater)* Blackball* Runanga/Rapahoe* <i>In 2020/2021 Council is installing District Metering Zones for its Schemes. Once these are operational, measured results will be confirmed and established as a basis to establish targets for leakage reduction.</i>	Not measured	<ul style="list-style-type: none"> 25% 5% 15% 	<ul style="list-style-type: none"> 20% 5% 15% 	<ul style="list-style-type: none"> 15% 5% 12% 	Improving (decreasing water loss)

What we're measuring	How we'll measure	Target				
		Current Performance (2019/2020)	Year 1 (2021/2022)	Years 2 – 3 (2022/2023 & 2023/2024)	Years 4 – 10 (2024/2025 to 2030/2031)	Target Trend (years 1-10)
	Drinking water supply compliance with following sections of the drinking water standards:					
	Part 4 – bacteria ²¹ compliance criteria - <ul style="list-style-type: none"> • Greymouth (now includes Taylorville/Dobson/Stillwater) • Runanga/Rapahoe* • Blackball <i>* Assumes the Runanga/Rapahoe supply will become or remain a chlorinated supply</i>	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	No change
	Part 5 – protozoal compliance criteria - <ul style="list-style-type: none"> • Greymouth (now includes Taylorville/Dobson/Stillwater) • Runanga/Rapahoe * • Blackball <i>* Assumes the Runanga/Rapahoe supply will become or remain a chlorinated supply</i>	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved 	No change

²¹ Bacteria (eg E.Coli) and protozoa (eg Giardia and Cryptosporidium) are small living organisms (bugs and such like) that are harmful to humans. Bacteria can be removed by chlorine disinfection whereas protozoa cannot and require higher levels of treatment.

What we're measuring	How we'll measure	Target				
		Current Performance (2019/2020)	Year 1 (2021/2022)	Years 2 – 3 (2022/2023 & 2023/2024)	Years 4 – 10 (2024/2025 to 2030/2031)	Target Trend (years 1-10)
Average consumption of drinking water per day per resident	Figures below are from July 2019 to June 2020 Breakdown –					
	<i>Scheme</i>	<i>Litres supplied per year</i>	<i>Population serviced</i>	<i>Consumption</i>		
	Greymouth (includes Dobson/ Taylorville/ Stillwater)	2,407,365,000	8,360	789		
	Runanga/ Rapahoe *	261,063,000	1,090	656		
	Blackball	48,229,000	280	471		
	Totals	2,716,657,000	9,730	639		
	<i>Supply and consumption includes industrial/commercial use</i> <i>Normal resident population ex 2013 Census</i> <i>Consumption expressed as litres per person per day.</i> <i>* Runanga/Rapahoe connected to Greymouth supply</i>				639 litres per person per day	< 640 litres per person per day < 640 litres per person per day < 550 litres per person per day Improving (decreasing water use)
Our response times to reported faults	Median response times to faults or unplanned interruptions: (Where contaminated sites are discovered or identified through site investigations response times will be longer if consents are required to remove and dispose of material)					
	• Attendance time for urgent call-outs (from notification)				45 minutes	1 hour
	• Resolution time for urgent call-outs (from notification)				1.48 hours	5 hours
	• Attendance time for non-urgent call-out				1.45 days	1.5 working days
	• Resolution time for non-urgent call-outs				2.12 hours	5 working days

Reporting of Performance Measures

Council monitors its performance to ensure levels of service are maintained and to improve service delivery. Reporting performance information is a key element of performance management. Interpreting results and communicating them to Council, management and the community provides a picture of service performance across Council. Performance measures for water supplies are reported through the Annual Report and reports to Council.

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6. How It Will Be Funded

6.1 Funding policy, fees and charges

The Council's funding and financial policies set out details of how this activity is funded. In summary, new capital expenditure is funded largely through borrowing and/or subsidies. Other sources are special funds, or from developers where there is growth-based demand. Operational expenditure is largely funded from targeted rates, with some user charges. Please refer to the Council's Revenue and Financing Policy for more details.

6.2 Operational funding requirements

	2021 Annual Plan \$000	2022 LTP Year 1 \$000	2023 LTP Year 2 \$000	2024 LTP Year 3 \$000	2025 LTP Year 4 \$000	2026 LTP Year 5 \$000	2027 LTP Year 6 \$000	2028 LTP Year 7 \$000	2029 LTP Year 8 \$000	2030 LTP Year 9 \$000	2031 LTP Year 10 \$000
INCOME											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (including targeted rates for water supply)	2,820	2,600	2,946	2,976	3,081	3,271	3,298	3,421	3,561	3,706	3,820
Subsidies and grants (operating and capital)	1,973	4,440	-	-	-	-	-	-	-	-	-
User charges and regulatory income (consent fees, infringements etc...)	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	-	-	-	-	-	-	-	-	-	-	-
Other income	-	-	-	-	-	-	-	-	-	-	-
Total income	4,793	7,040	2,946	2,976	3,081	3,271	3,298	3,421	3,561	3,706	3,820
EXPENDITURE											
Staff costs	-	-	-	-	-	-	-	-	-	-	-
Operating & maintenance costs	1,116	1,341	1,327	1,328	1,357	1,386	1,415	1,449	1,489	1,530	1,566
Finance costs	193	231	245	243	241	238	236	233	230	227	224
Internal charges and overheads applied	290	313	321	325	331	338	345	354	362	371	382
Other operating expenditure	-	-	-	-	-	-	-	-	-	-	-
Depreciation	549	549	549	549	549	549	549	549	549	549	549
Total expenditure	2,147	2,434	2,441	2,445	2,478	2,511	2,545	2,585	2,630	2,677	2,721
Surplus (deficit) of activities	2,646	4,606	505	531	603	760	753	836	931	1,029	1,099

6.3 Capital works plan

	2021 Annual Plan \$000	2022 LTP Year 1 \$000	2023 LTP Year 2 \$000	2024 LTP Year 3 \$000	2025 LTP Year 4 \$000	2026 LTP Year 5 \$000	2027 LTP Year 6 \$000	2028 LTP Year 7 \$000	2029 LTP Year 8 \$000	2030 LTP Year 9 \$000	2031 LTP Year 10 \$000
CAPITAL EXPENDITURE - TO IMPROVE THE LEVEL OF SERVICE											
Miscellaneous new capital	151	213	82	82	82	82	-	-	-	-	-
	151	213	82	82	82	182	100	100	100	100	100
CAPITAL EXPENDITURE - TO REPLACE EXISTING ASSETS											
Replacement reservoir - Puketahi Street	1,278	2,700	-	-	-	-	-	-	-	-	-
Replacement reservoir - Tasman View		480	-	-	-	-	-	-	-	-	-
Replacement reservoir - Arnotts Heights		520	-	-	-	-	-	-	-	-	-
Replacement reservoir - Cobden		1,096	-	-	-	-	-	-	-	-	-
Additional Intake Bore		250	-	-	-	-	-	-	-	-	-
General renewals of the water supply network	1,864	1,015	866	885	949	1,019	1,088	1,168	1,255	1,347	1,435
	3,142	6,061	866	885	949	1,019	1,088	1,168	1,255	1,347	1,435

6.4 Disposal plan

6.5 Funding impact statement

	2021 Annual Plan \$000	2022 LTP Year 1 \$000	2023 LTP Year 2 \$000	2024 LTP Year 3 \$000	2025 LTP Year 4 \$000	2026 LTP Year 5 \$000	2027 LTP Year 6 \$000	2028 LTP Year 7 \$000	2029 LTP Year 8 \$000	2030 LTP Year 9 \$000	2031 LTP Year 10 \$000
[A] SOURCES OF OPERATING FUNDING											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates	2,820	2,600	2,946	2,976	3,081	3,271	3,298	3,421	3,561	3,706	3,820
Subsidies and grants for operating purposes	-	414	-	-	-	-	-	-	-	-	-
Fees and charges	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	-	-	-	-	-	-	-	-	-	-	-
Local authorities fuel tax, fines, infringement fees, & other receipts	-	-	-	-	-	-	-	-	-	-	-
Total operating funding [A]	2,820	3,014	2,946	2,976	3,081	3,271	3,298	3,421	3,561	3,706	3,820
[B] APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	1,116	1,341	1,327	1,328	1,357	1,386	1,415	1,449	1,489	1,530	1,566
Finance costs	193	231	245	243	241	238	236	233	230	227	224
Internal charges and overheads applied	290	313	321	325	331	338	345	354	362	371	382
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding [B]	1,598	1,885	1,893	1,896	1,929	1,962	1,996	2,036	2,081	2,128	2,172
Surplus (deficit) of operating funding [A - B]	1,222	1,129	1,053	1,080	1,152	1,309	1,302	1,385	1,480	1,578	1,648
[C] SOURCES OF CAPITAL FUNDING											
Subsidies and grants for capital expenditure	1,973	4,026	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	922	981	(62)	(70)	(78)	(65)	(70)	(73)	(81)	(87)	(69)
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding [C]	2,895	5,007	(62)	(70)	(78)	(65)	(70)	(73)	(81)	(87)	(69)
[D] APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
—to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
—to improve the level of service	1,477	213	82	82	82	182	100	100	100	100	100
—to replace existing assets	3,142	6,061	866	885	949	1,019	1,088	1,168	1,255	1,347	1,435
Increase (decrease) in reserves	(502)	(137)	44	44	44	44	44	44	44	44	44
Increase (decrease) of investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding [D]	4,117	6,136	991	1,010	1,074	1,244	1,232	1,312	1,399	1,491	1,579

Surplus (deficit) of capital funding [C – D]	(1,222)	(1,129)	(1,053)	(1,080)	(1,152)	(1,309)	(1,302)	(1,385)	(1,480)	(1,578)	(1,648)
Funding balance: [A – B] + [C – D]	-	-	-	-	-	-	-	-	-	-	-

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7. What Could Stop Us

7.1 Activity risks and mitigation

Activity risks and our plans to mitigate this risks are outlined in the following table for this activity.

ISSUE/RISK	Risk Now	OUR PLAN (MITIGATION)	BENEFITS	COST (2021 \$)	Risk over LTP	TIMELINE
Deferred renewals. The outcome from condition assessments carried out to date confirm we have significant deferred renewals which need to be addressed in order to maintain levels of service and avoid potential critical failures.	High	<ul style="list-style-type: none"> Utilise information from the condition assessments to identify priority areas for renewals based on the importance of the infrastructure to consumers and other critical factors, e.g. effect on the environment if failure occurs. Increase rate funding to this activity after Year 2 by \$41,000 per year until the backlog is removed. Utilize other sources of funding when available such as Department of Internal Affairs. For this plan \$309,000 is included in Year 1. In the current Year (2020/21) external funding of \$1 M is being investment towards the renewal of the Greymouth Reservoir. Improve efficiencies. <p>More cost-effective materials, operations and construction methods, (e.g. concrete lining of existing pipes if assessed as best practical long term solution).</p>	Maintain existing levels of service. Help prevent critical failure of assets.	Initial expenditure increase in Year 1 of \$309,000 following by continuing with implementing current LTP strategy of re-commencing Annual renewal expenditure increase by \$410,000 by Year 12 commencing in Year 3 (ie \$41,000 per year increase)	Medium	Renewal backlog addressed fully by year 25
Ownership of Community Infrastructure Assets.	High	<ul style="list-style-type: none"> Status Quo <p>Potentially not an option if the Government enacts new legislation for change however for this activity it is assumed stormwater will remain under the stewardship and governance of Council.</p>	Provides some certainty	NIL over and above business as usual costs	Medium	Over life of LTP

ISSUE/RISK	Risk Now	OUR PLAN (MITIGATION)	BENEFITS	COST (2021 \$)	Risk over LTP	TIMELINE
A direct issue as to who owns and who will fund this infrastructure asset affects who will make decisions and who will be able to plan for future investment.	High	<ul style="list-style-type: none"> External Organisational Structure <p>Monitor developments in this area and if status quo is not an option, then ensure the communities that own the infrastructure continue to have a voice in future decision making.</p>	To be determined	Total costs to property owners to be determined	Medium	Assume outside LTP
Climate Change Existing residential and other developments at risk from coastal erosion and other climate change effects. Communities at Rapahoe and southern end of lower Cobden currently at risk.	High*	<ul style="list-style-type: none"> Retreat of residential and other developments <p>May mean abandonment / removal and/or relocation of infrastructure including protection works at new locations.</p>	Avoids damage and costs	<p>Cost specific to affected areas with costs likely to be incurred by properties owners, Central Government and Local Government, plus others e.g. Earthquake Commission</p> <p>No costs specifically allocated for this issue/risk in this AMP. Assumes new infrastructure for relocated areas would be part funded by those who benefit.</p>	Low	Over life of LTP

ISSUE/RISK	Risk Now	OUR PLAN (MITIGATION)	BENEFITS	COST (2021 \$)	Risk over LTP	TIMELINE
	High*	<ul style="list-style-type: none"> Protect existing residential and other developments <p>Will mean provision of or upgrade of existing infrastructure to protect communities and other infrastructure.</p>	Protects from damage	<p>Cost specific to affected areas with costs likely to be incurred by properties owners, Central Government and Local Government, plus others e.g. Earthquake Commission</p> <p>No costs specifically allocated for this issue/risk in this AMP.</p> <p>Assumes costs would be part funded by those who benefit.</p>	Medium	Over life of LTP
	High	<ul style="list-style-type: none"> Other strategies instead of, or as well as above options such as: <p>Reduce carbon heat emissions to slow down, halt and reverse global warning.</p>	Slows down or halts global warming	No direct costs. To be taken into account in re-purchasing decisions, e.g. vehicle fleet, heating options for buildings.	Medium	Over life of LTP
Te Tai o Poutini Plan (One Plan) – Management of risks from natural hazards and climate change The TTP Plan will identify areas subject to hazards, undergo community consultation and develop appropriate planning zones.	High*	<ul style="list-style-type: none"> Work collaboratively with other Councils during the process of identifying and responding to hazard and climate change risks. See also options above for Climate Change. 	See above	See above	Medium	Over life of LTP

ISSUE/RISK	Risk Now	OUR PLAN (MITIGATION)	BENEFITS	COST (2021 \$)	Risk over LTP	TIMELINE
Te Tai o Poutini Plan (One Plan) – Consultation documents being released in Year 1, submissions and hearings Years 2 and 3, Decisions released Year 4 which are subject to appeal to Environment Court. Not able to plan with any certainty for impacts of Plan changes on infrastructure until Year 3 and still likely to be subject to change in Year 4 or later.	High	<ul style="list-style-type: none"> Monitor progress, assess and recommend infrastructure strategies for activities in the next LTP. 	Avoids unnecessary investment until such time as there is some certainty with respect to any proposed changes that will affect infrastructure.	No costs specifically allocated for this issue/risk in this AMP. Costs to be considered for next LTP.	Medium	Over life of LTP
	High	<ul style="list-style-type: none"> Monitor progress on consultation and adoption of the One District Plan and promote funding of infrastructure for urban expansion through private sector investment (subdivision) development and financial contributions. 	Costs will be covered by this who benefit from the new developed areas.	No costs specifically allocated for this issue/risk in this AMP.	Medium	Over life of LTP

ISSUE/RISK	Risk Now	OUR PLAN (MITIGATION)	BENEFITS	COST (2021 \$)	Risk over LTP	TIMELINE
Fund water supply scheme upgrades. See General Upgrades list above	Medium*	<ul style="list-style-type: none"> Fund these works through the LTP 	Reduced risk of water restrictions. Improved fire fighting capacity (Greymouth) Reduced wastage through leaks Cost savings through removing leaks New or enhanced services to communities More information on water quality enabling more informed water management decisions.	Refer details in Section 4 above	Low	Over life of LTP
Vulnerability of buried pipes in soft ground to natural hazards such earthquakes and liquefaction. Also includes Climate Change	High*	<ul style="list-style-type: none"> Carry out upgrade works based on priorities established from condition assessments, and ensure use of modern design techniques to mitigate the effects of liquefaction of infrastructure where not practical to relocate. 	Increased resilience of the asset.	Funded as part of the renewals programme, see Section 6.	Medium	Over Life of LTP and ongoing
	High	<ul style="list-style-type: none"> Managed retreat where other options are not economically feasible. 	Avoid areas of higher risk.	No costs specifically allocated for this issue/risk in this AMP.	Medium	Over Life of LTP and ongoing

ISSUE/RISK	Risk Now	OUR PLAN (MITIGATION)	BENEFITS	COST (2021 \$)	Risk over LTP	TIMELINE
Damage to pump stations, reservoirs, treatment plants and other water supply infrastructure from natural hazards, eg earthquakes.	Medium	<ul style="list-style-type: none"> Review resilience of infrastructure components at the time components fall due for replacement. 	Improves resilience of the asset.	To be determined at time of renewal. With the exception of replacing the reservoir for Greymouth now buildings or reservoirs fall due for replacement within the life of the LTP. Some components such as pumps. Electrics and controls fall due for replacement.	Medium	Over Life of LTP and ongoing
Council has adopted a Master Plan for the CBD Renewal Project. Issue is impact on water supply infrastructure.	High*	<ul style="list-style-type: none"> Provide funds to relocate or protect existing underground infrastructure as part of the development costs. Review CBD Renewal designs to accommodate existing underground infrastructure once information is known as to location and extent of proposed next stages of development. <p>Experience with the first two stages is that it is crucially important to initially locate existing underground services in order to as much as possibly avoid delays and increased costs.</p> <p>Issues identified to date include:</p> <ul style="list-style-type: none"> Proposed requirement for new or upgraded infrastructure (to compensate for lowered road levels). Infrastructure may need to be lowered or protected. Consequential issues relating to excavation to install new underground infrastructure such as the presence of coal tar (requiring resource consents) and unknown old underground infrastructure (power and communications) 	Ensures all effects of development are addressed.	To be determined. It is noted Council's expectation is that development will be initiated by property developers.	Medium	Over Life of LTP

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7.2 Assumptions and uncertainties

In order to help the Council in its long-term decision-making, a number of assumptions have been made about the future. Refer PART F:2: of the Long Term Plan for the significant forecasting assumptions applied in the preparation of the Plan.

The following risks and mitigations are specific to this activity and supplement the information and assessments included in the LTP.

The forecasts in this AMP are based on the following assumptions:

- Further regulatory changes are unknown and any associated investment has not been budgeted for (although it has been signalled that increases to the Drinking Water Standards are “more likely” than “less likely”, these potential changes have not been included in this plan due to the lack of details available);
- Demand (quantity) will remain relatively unchanged, or at least will not increase to an extent that capacity upgrades are required. The exception could be tourism demand and District Plan changes (which are unknown). These this will be monitored over the life of this plan;
- Levels of service will remain unchanged, with the exception that as pipes are renewed they will be upgraded to meet Fire Fighting Standards where required and built with more modern, resilient materials;
- Provision for replacement of assets will be as forecast by the renewal model set out in this Activity Management Plan and is aligned to the Financial Strategy which has been formulated to ensure that our services remain affordable to our community;
- The financial forecasts for the water supplies activity are adjusted for projected inflation based on the BERL indices with the exception of Year 1, as per the assumptions outlined in our Long Term Plan. In Year 1, we have used indices based on our knowledge of the market and our local expertise.