

Water Supply Asset Management Plan Summary

2008



Absolutely

POSITIVELY

ME HEKE KI PŌNEKE
WELLINGTON CITY COUNCIL **Wellington**

This Asset Management Plan has been prepared by



Summary Water Supply Asset Management Plan 2009

Wellington City Council

January 2009

Table of Contents

1.0	Overview	1
	1.1 Activity description	1
	1.2 Council involvement	1
	1.3 Key water supply issues	2
2.0	Strategic context	3
	2.1 Strategic framework	3
	2.2 Growth in demand	5
	2.3 Water supply demand projections	7
	2.4 Demand management	8
3.0	Our assets	9
	3.1 Asset description	9
	3.2 Asset capacity and performance	11
	3.3 Asset condition	12
	3.4 Significant negative effects	13
	3.5 Levels of service	14
	3.6 Community engagement	16
4.0	Managing our assets	17
	4.1 Asset management model	17
	4.2 Risk management	17
	4.3 Operating and maintaining the assets	18
	4.4 Asset investment and growth	18
5.0	Financial information	20
	5.1 Financial forecast	20
	5.2 Assumptions and data confidence	21
	5.3 Development contributions	22
	5.4 Funding the water supply activity	22
	Attachment – Consolidated financial forecast	a

1.0 Overview

1.1 Activity description

The water supply network is managed by the Council to ensure both cities have high-quality water available at all times for drinking and other household and business uses, and for emergencies such as fire fighting. The Council aims to ensure this network is managed as efficiently and cost-effectively as possible.

Wellington has a water network that includes 81 reservoirs and tanks, 34 water pumping stations, more than 7300 hydrants and about 1000km of underground pipes.

A role of Council is to promote water conservation through public education efforts and by installing and reading water meters. Meters allow trends in water consumption to be monitored and assist with the detection of leaks. Commercial customers are charged for water used and the meters also provide an incentive for them not to waste water.

The water network is managed in accordance with the water asset management plan, which ensures detailed service level requirements such as network condition and capacity, water quality standards, continuity of supply, response to complaints, and criteria for upgrades and renewals are met. Under the plan, we detail how we will comply with all relevant legislation and regulatory requirements at all times.

Key service level requirements and underlying standards include:

- Drinking water supplied meets relevant New Zealand Standards.
- All parts of the network should have sufficient capacity for customer supply and fire-fighting requirements. Pipes that do not meet these requirements are upgraded. We replace about 12.5km of pipeline a year. This is about one percent of the network.
- All parts of the network should have at least 24 hours storage capability in case of emergency.

This plan covers the ten year planning period from 2009/10 to 2018/19.

1.2 Council involvement

A secure supply of water is a fundamental requirement to protect the health and wellbeing of the community, including key support for fire protection and business development.

In urban areas potable water supply are most effectively supplied by means of reticulated (piped) community water supply. This allows the costs associated with maintaining high standards and efficient infrastructure to be spread over a wide population. The existing water supply system has been developed and built up over many years as a public system to serve the needs of the community.

The Wellington City Council manages Wellington's water supply because:

- The activity directly supports the achievement of a number of community outcomes (outcomes the Wellington community believe describe the city they wish to live in). It also directly supports the achievement of Council outcome nine (safer – protecting public health and the environment), and supports economic growth of the community.
- The Council can provide a specified level of service in a cost-effective manner.

- The Local Government Act 2002 (section 130) requires the Council to continue to provide water services and maintain its capacity to do so.
- The Health Act 1956, (sections 23 and 29) requires Council to 'improve, promote and protect public health' within the district as necessary.
- The community, through the community outcome process, has strongly indicated its support of Council involvement to sustainably manage the water supply activity to protect public and environmental health and to actively reduce adverse environmental impacts.

1.3 Key water supply issues

Key water supply issues identified by the Wellington City Council which are being addressed are:

- **Levels of service.** The level of service provided to Wellington City by the water supply network is consistent with current industry standards and levels of service provided by other councils in New Zealand and analysis indicates the current level of service broadly satisfies community expectations. The Council will continue to gather data to better describe the actual level of service provided and determine resident satisfaction with a greater level of confidence.
- **Future change.** The effects of future climate change are uncertain, although warmer temperatures and increased periods of little to no rainfall are expected. Population growth and urbanisation are expected to continue. The projected increase in demand for water from these changes requires active management, recognising that planning for change and implementing identified initiatives takes time.
- **Risk of natural disaster.** A catastrophic natural disaster, such as a major earthquake, could limit the ability to provide clean, wholesome water to the community. Reinstating systems to distribute drinking water, both temporarily and permanently, would be costly and would take considerable time.
- **Continuous improvement.** The Council recognises the fundamental need to continually improve its asset management processes. Water supply services must be provided at agreed service levels and with increasing efficiency to reduce costs, reduce resource use and minimise environmental impacts.

2.0 Strategic context

2.1 Strategic framework

The Council has facilitated the identification and definition of Community Outcomes by the Wellington “community”. The Community Outcomes guided the development of Council’s own City Outcomes which interpret the Community Outcomes over which Council has direct influence. The Council has identified key strategic areas, and within each of these areas has developed strategies in order to deliver the City Outcomes. In turn, these strategies form a key input into the asset management plans, along with stakeholder and legislative requirements, current and future demand information, and risk issues.

Figure 1 indicates how they link to the key legislation, planning and documents that guide Council’s water supply activity.

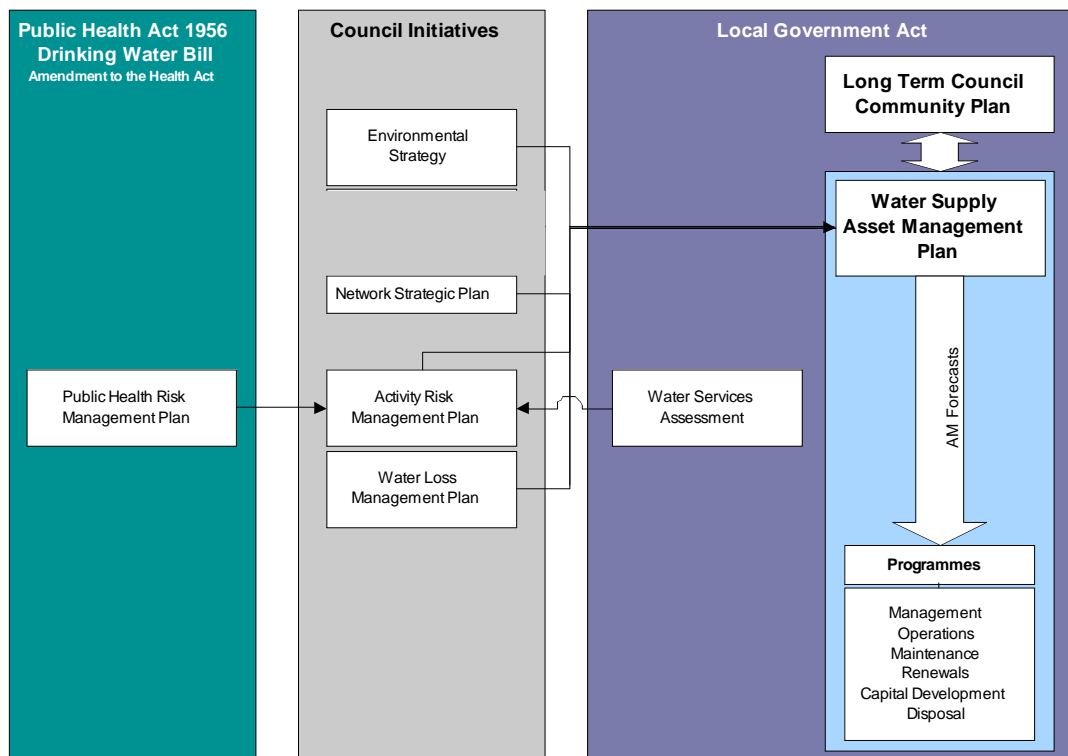


Figure 1 - Strategic framework

The water supply activity contributes to the following Community Outcome

‘Wellington’s long-term environmental health will be protected by well-planned and well-maintained infrastructure’.

This plan gives effect to these high level strategies, Council and Community Outcomes by having specific plans and a detailed programme of works to support and encourage quality of life, enterprise and prosperity through the provision of water supply services.

Figure 2 shows the linkages between the Community Outcomes defined in the Long Term Council Community Plan and the water supply activity, and the nature of the contribution.

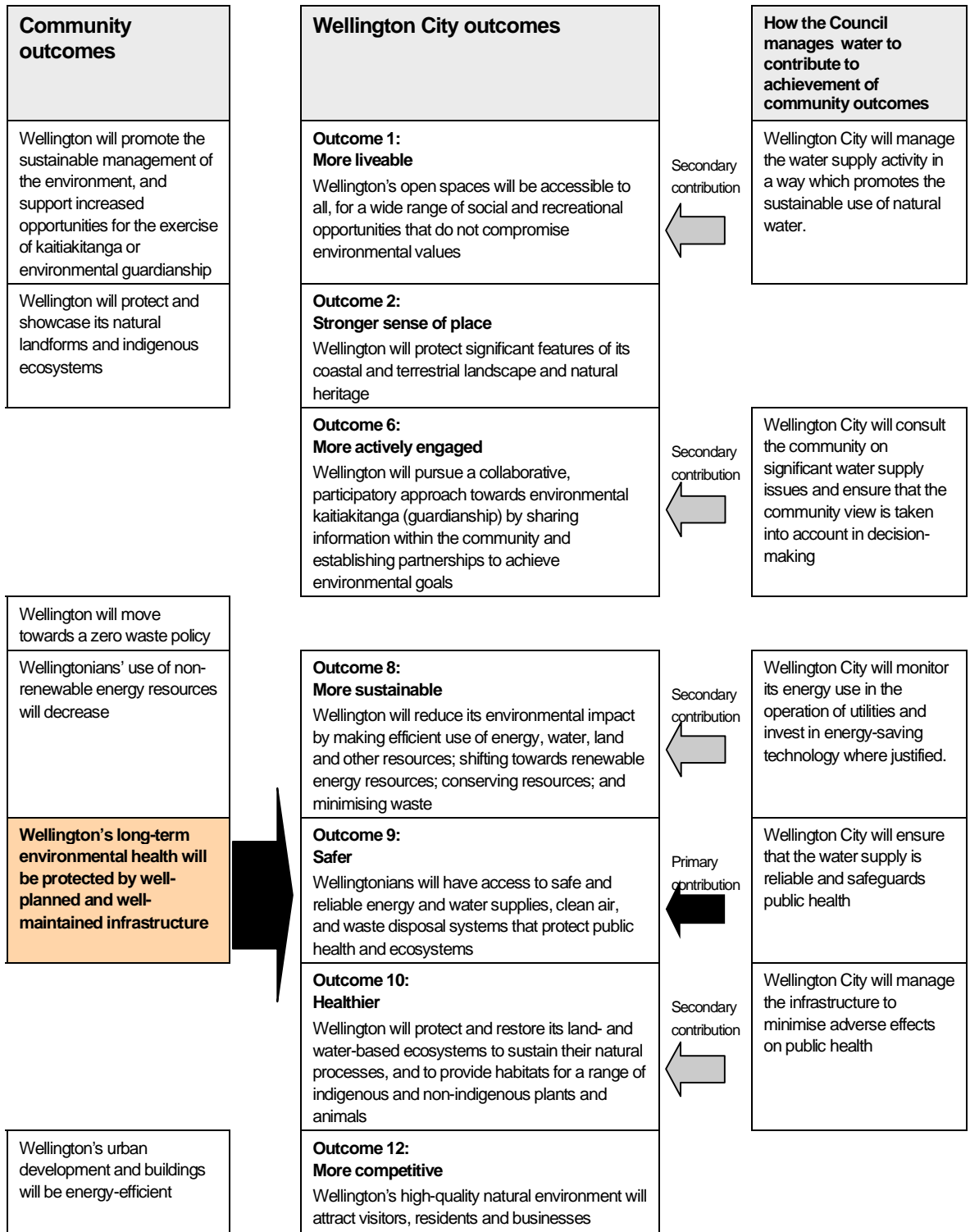


Figure 2 - Community Outcomes, City Outcomes and strategies

2.1.1 Network Strategic Plan

The Network Strategic Plan, when completed, will identify the key strategic issues facing the water supply network and set out our approach to managing these issues.

2.1.2 Public health risk management plan

A public health risk management plan has been submitted to the Regional Health Board need to meet the requirements of the drinking-water supplies amendment to the Health Act 1956.

This plan covers health related risks and sets out how the Council will manage these risks to acceptable levels. Risk management is an essential part of the Council's proactive approach to managing the city's water supply. Rather than simply responding to problems as they occur, risk management is about identifying and managing potential problems in advance.

The risks, strategies and recommendations from the public health risk management plans are consolidated in the asset management programmes and quality processes.

2.1.3 Water services assessment

The Local Government Act 2002 requires all Councils to carry out assessments of water and sanitary services. This requirement is to ensure that sufficient thought is given to the provision of water and sanitary services of an acceptable standard sustainably into the future. The assessments cover both public and private water supply systems.

Assessments of water and sanitary services must be included or summarised in the Long Term Council Community Plans (LTCCPs) of councils and be the subject of a public consultation process specified in the Act.

2.1.4 Water management plan

One of the Council's highest environmental priorities for the next three years is to promote water conservation and more efficient use of water. This is particularly important in light of Wellington's growing population, which is placing increased pressure on water resources. The Council has been working with other councils on a region-wide Wellington water management plan which will suggest targets for water conservation. The Council will work with the Wellington community to identify water conservation opportunities, while also looking at ways we can reduce our own water usage. The plan will be implemented over the following two years.

2.2 Growth in demand

2.2.1 Changing demand

Factors which influence demand for water include:

- Growth
 - Population change.
 - Sub-divisional activity and residential change.
 - Commercial and industrial change.
- Climate change.
- Change in user consumption decisions and increasing customer expectations.

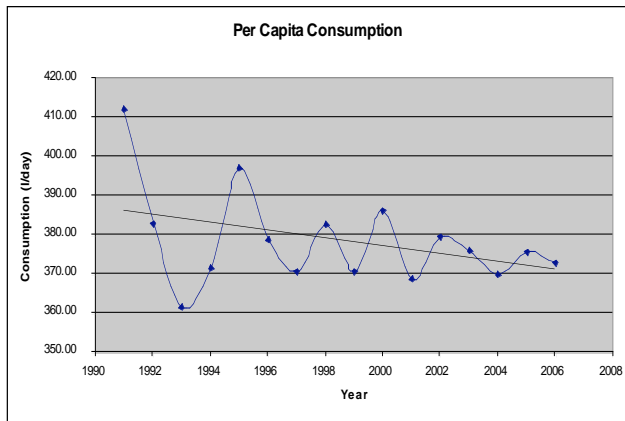
2.2.2 Key issues with changing demand

Water supply management is an activity that influences a range of outcomes, including environmental well-being, health, sustainability and economic development. The key issues for the water supply activity related to the well being of the city are as follows:

Social

The expected growth rate in Wellington City is predicted to be approximately 0.7 per cent per year over the next 20 years¹ (an increase of approximately 27,000 residents). Further, the average number of people per dwelling is decreasing in Wellington, as it is elsewhere in New Zealand. Commercial premises are being converted into apartments within the central business district, and housing needs are changing to smaller lot sizes. In line with declining household size, Wellington will need to provide approximately 24,000 additional dwellings between 2006 and 2026

Increasing population implies increasing water demand, accentuated by the declining household size. Further, development changes and changes in the local economy and growth of particular kinds of business will affect the volumes of water supply required.



Although there has been an increase in the use of domestic water consuming devices, there is an increasing public awareness that water is a valuable resource that should be conserved. Individual consumption decisions and Council's initiatives to reduce water wastage and promote more efficient use of water has resulted in decreased water consumption per capita to offset effects of growth.

Figure 3 – Water consumption per capita

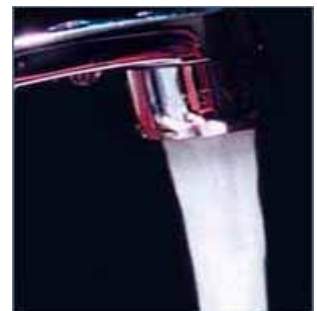
Changes in population growth and water consumption decisions affect:

- The ability of the water supply network to meet the increase in demand of water supply.
- Residents' activities during occasional water restrictions in extreme dry weather.

In recent years, there has been an increased awareness of public health safety issues and higher expectation of a safe and reliable water supply network by customers.

Environmental

There is an increasing focus on the quality of the environment and the sustainable use of natural resources. Climate change, leading to longer dry spells and higher temperatures, is likely to lead to an increase in the demand for water for garden irrigation and reduce the rainfall volumes available for water supply. Greater Wellington Regional Council has informed councils within the region that current allocations could not be guaranteed by 2007 for a 50 year



¹ A slow down in growth is expected around 2030 in conjunction with an ageing population and projected slowing of world population growth

drought scenario without capital development works. The Wellington City Council, together with Greater Wellington Regional Council, will continue to implement a range of strategies intended to reduce and manage the demand for water with the aim of deferring the construction of new facilities.

Cultural

Public health and the quality and reliability of water supply is an issue of importance to all water users. Asset management planning includes a range of strategies to identify and manage the future water supply needs of the city.

Economic

An effective and reliable water supply system supports economic activity in the city. The strategies and funding policies in the asset management plan are focused on minimising the cost of services and ensuring the equitable allocation of costs while maintaining and improving the quality of the water supply service. Development changes and changes in the local economy and growth of particular kinds of business will affect the volumes of water supply required.

2.3 Water supply demand projections

Figure 4 presents high, medium and low forecasts of water supply demand within Wellington. The medium forecasts assume medium growth projections and ongoing implementation of Council water conservation initiatives noted below.

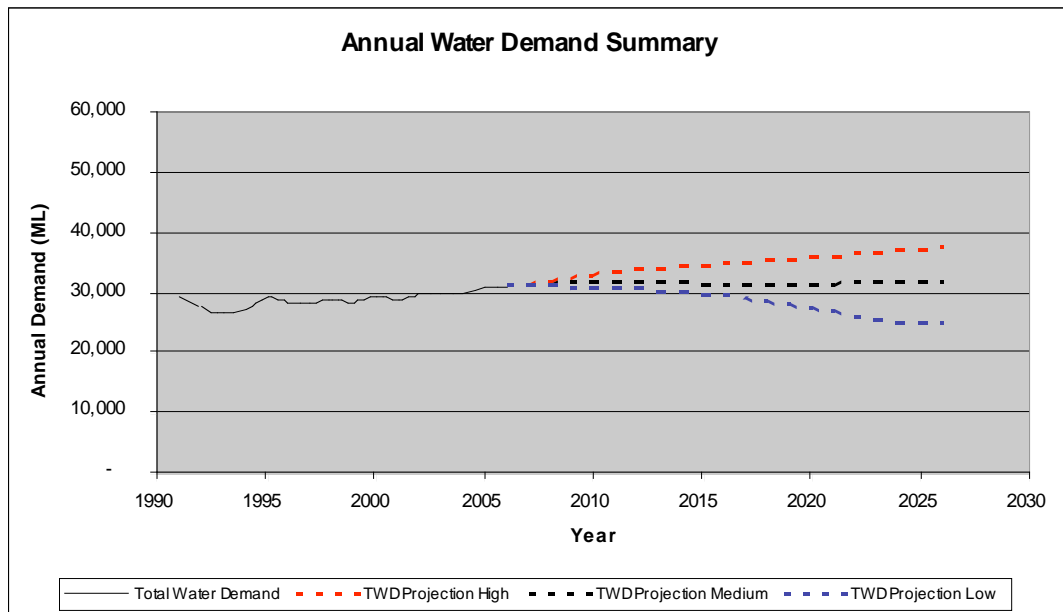


Figure 4 - Projected cumulative increase in water supply demand

2.4 Demand management

In addition to asset development works, the Council currently implements the following demand management techniques:

Metering and charging practices

- Metering – commercial premises have meters installed to monitor consumption. District and area meters are used to assist in demand management, leak detection within pressure zone boundaries and the development of a fully interactive modelling and control system.
- Residential properties that have a meter installed on a voluntary basis are given the option to be billed on the basis of recorded usage, thus encouraging residents to amend their consumption to minimise their water bill. All metered commercial premises are charged on a volumetric basis.

Education

- Environmental awareness and the links to water supply management are promoted to the public and to Council business units.
- Greater Wellington Regional Council publications are made available at the beginning of summer, and media releases are sent out when the water use approaches the trigger of 83,000 cubic metres per day.

Technical options – although not strictly demand management initiatives, these initiatives minimise capital upgrade works required to meet increasing demand and include the implementation of integrated solutions through:

- targeted assessments to identify sources of leaks and works to reduce this
- use of pressure-reducing valves to reduce water losses
- alternative feeds – allowing water to be re-routed to overcome pressure and flow deficiencies.

Demand management options that will be considered for possible future introduction include:

Charging practices

- Metering – the progressive introduction of revenue meters for all premises.

Education

- Increasing public awareness programmes to promote the need for water conservation and its benefits.

Incentives – developing policy tools to encourage:

- better use of rainfall runoff, for example, for irrigation purposes, and alternative water sources
- installation of low-flow appliances and other efficient water-use devices.

Technical options – implementing integrated solutions through:

- increased proactive leak detection and works to reduce this
- further pressure management strategies to reduce water losses.

3.0 Our assets

3.1 Asset description

Treated water is delivered from the bulk supply system from Greater Wellington Regional Council into the Wellington City service reservoirs and the distribution network at 18 separate supply points.

The broad asset groups and the physical quantities of these assets which enable Wellington City Council to deliver water supply services are shown in Figure 5. Figure 6 shows the proportion of the total replacement value (last valued 30 June 2005) for the main asset groups.

Activity	Asset components	Quantity
Reservoirs	Reservoir and tanks	81
	Active dams	2
	Flow and level monitoring equipment	59
Pipe network	Pipes	1,019 km
	Domestic connections	>60,000
	Commercial and industrial connections	> 3,500
	Fittings, valves and controls	>100,000
Pumping stations	Pumping stations	34
	Flow control stations	30

Figure 5- Water supply assets summary

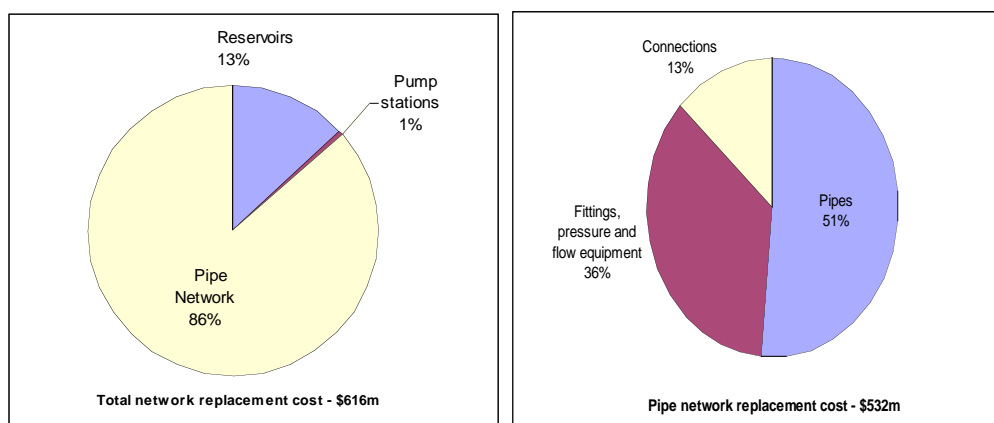


Figure 6 - Water supply asset description by replacement cost

3.1.1 Reservoirs

Reservoirs provide storage capability to better manage fluctuations in demand and pressure effects within the network, allow for quality monitoring and remedial action/isolation if required, and provide security of supply in the case of temporary loss of bulk water supply.

- The largest 35 reservoirs hold approximately 90 per cent of the water. The layout of the reservoirs indicates that the larger reservoirs are in the southern half of the city and are at about 90m elevation. Generally the smaller reservoirs are at the edge of

the city – at higher elevations. Water to service the higher areas is pumped from the key lower level reservoirs to the smaller high level reservoirs.

- The majority of the reservoirs (by number) are small reservoirs (<1000 m³). However, 27 per cent of the reservoirs are 3000m³ or larger.
- 76 per cent of the reservoirs are concrete.
- While 17 per cent of the reservoirs were installed less than 20 years ago, and 75 per cent less than 60 years ago, 11 per cent are older than 80 years, as presented in Figure 7.

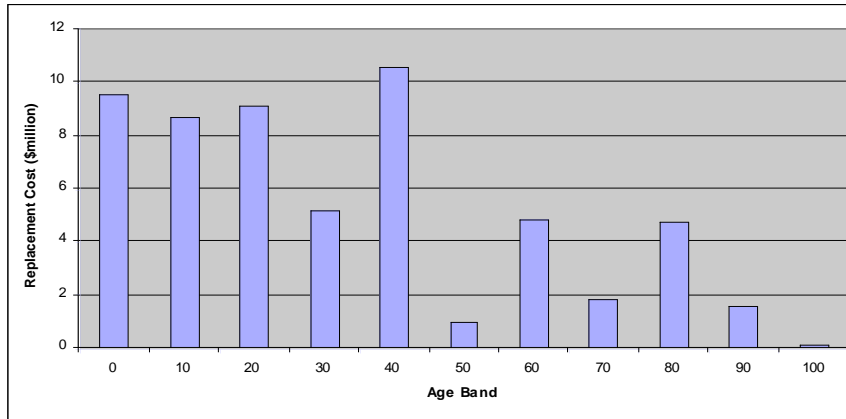


Figure 7- Reservoir age profile

3.1.2 Pipe network

Water is distributed to the community from the reservoirs through the pipe network. Some low-lying areas fed by a high-level reservoir have pressure-reducing valve (PRV) installations. These manage high pressures in the network which may damage pipelines. The majority of the water supply reticulation network is less than 190mm diameter pipes. Only 13 per cent of the network by replacement cost is of 300mm diameter or greater.

- The majority of the reticulation is asbestos cement and cast iron.
- While approximately 20 per cent of the network was installed less than 30 years ago, 17 per cent of the network is older than 60 years, and 10 per cent older than 80 years, as presented in Figure 8.

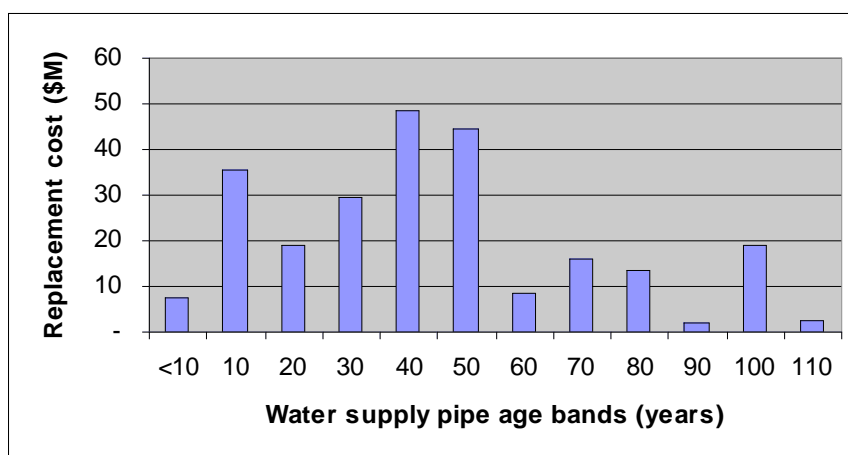


Figure 8- Pipe network age profile

3.1.3 Pumping stations

Pumping stations raise water to reservoirs, and boost pressure in some of the high-level pipes at the extremities of the network.

- 22 of the 34 pumping stations are small (<5kW) to medium (between 5 and 20kW)
- 40 per cent of the pumping station equipment, including pumpsets, electrical and instrumentation, and pipes, valves and fittings, is less than the adopted base life of 20 years, although approximately 89 per cent is less than 30 years old, as presented in Figure 9.

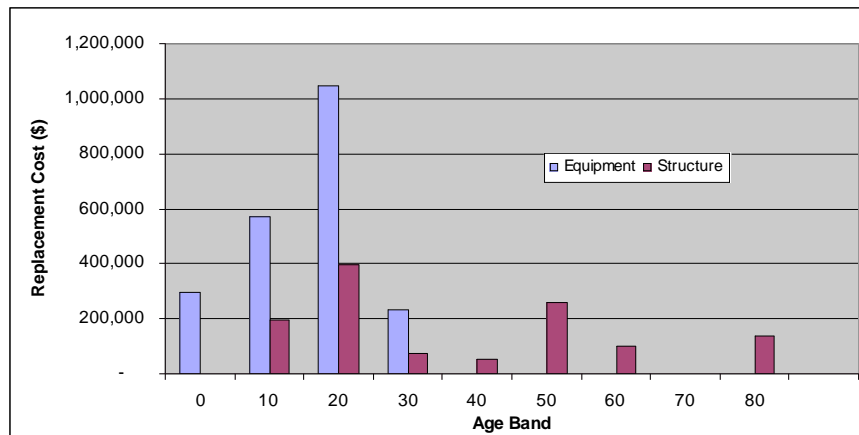


Figure 9- Pumping station age profile

3.2 Asset capacity and performance

3.2.1 Reservoirs

- Twelve out of the 81 reservoirs and tanks do not provide the required 24 hours storage. Additional reservoirs are being constructed and commissioned, and the Council is developing a reservoir optimisation strategy as part of a network strategic plan to best plan for future requirements.
- Network optimisation is being investigated as part of the development of the network strategic plan to improve pressure issues affecting approximately 2,387 properties, and to reduce operational expenditure.
- The operating levels of the receiving reservoirs from the Greater Wellington bulk supply do not meet the minimum 80 per cent during summer months where it drops to up to 32 per cent in some reservoirs. This loss of contingency storage places the community at some risk if there is a significant fault within the network leading to prolonged supply interruption, or a major fire or earthquake. Discussions regarding the Bulk Water Supply Agreement are being held with three other local authorities in the Wellington and greater Wellington areas in an attempt to address this issue.
- Supply of potable water to Wellington Hospital in the event of a major earthquake exceeds the hospital's existing onsite storage capacity. A joint enterprise between the Council, Greater Wellington and Capital & Coast District Health Board is being considered to address this risk.
- 36 of the 76 reservoirs have seismic auto shut-off valves to protect up to 87 per cent of the city's water supply in the event of an earthquake.
- The Council currently maintains nine individual tank clusters that are under capacity and will need to be replaced and upgraded with proper reservoirs.
- All reservoirs are roofed and protected against contamination from birds, vermin and vandals.
- There are some risks with inappropriately designed, installed or maintained systems in unserviced rural areas. Whilst it is unlikely that the Council will reticulate these areas in the foreseeable future, the Council is considering mechanisms that would ensure these systems are installed and maintained in a manner that minimises public health risk.

3.2.2 Pipe network

- The water quality in the city is generally good and has been regraded in 2008 as “b”. An “a” grading would suggest the distribution is completely satisfactory, complies completely with the DWSNZ 2005 and has a very low level of risk of contamination or system failure. A “d” grading indicates non-compliance with DWSNZ 2005 and an unsatisfactory level of risk. A “b” grading is considered implies satisfactory compliance with a moderately low level of risk. The Public Grading of Drinking-Water Supplies 2003 notes that a community the size of Wellington should achieve an “a” grading.
- Approximately 7 per cent of the pipe network is unlined steel and iron pipes. Tuberculation within these pipes is reducing pressure and corrosion and build up of sediments and bio-film is causing water quality issues. A programme is in place to replace or renovate 5.6km of these pipes annually.
- There are currently areas within the city where the network capacity is insufficient to sustain pressure and flows to our target levels of service during times of peak demand. Computer modelling is being used to investigate the performance of the system and will assist in identifying solutions to address these issues.
- There are still some areas where water is supplied directly from the bulk water supply system, causing occasional detectable levels of residual chlorine and resulting in no security of supply when the bulk water system is out of action. A rationalisation study carried out in 2003/04 addressed some situations with others still under investigation.
- There are issues with the security of supply around the central business district in case of a major earthquake. Options are being considered including an earthquake resistant ring main around the central business district.
- The current estimate of unaccounted for water from the Wellington system is approximately 20 per cent. District meters are to be used to analyse consumption within a zone to aid in the assessment and location of unaccounted for water so that the necessary repairs can be carried out to reduce water loss.

3.2.3 Pumping stations

- All 34 potable water pumping stations fulfil their duty except for one where there are issues during high demand periods. Programmes are in place to address these performance issues.
- The possibility of combining pumping stations is being considered as part of the development of the network strategic plan to optimise operations.
- The potable water pump stations have standby pumps should mechanical failure occur, which allows maintenance to be carried out with minimal impact on users and adjacent residents.

3.3 Asset condition

3.3.1 Reservoirs

- Three of the oldest reservoirs have been inspected and condition surveys completed. Structural and seismic analysis has been carried out on some of the strategically located reservoirs. They are assessed to be in reasonable physical condition even though they do not comply with the Building Code for reinforcement. Programmes are in place for the assessment of the remaining reservoirs and for undertaking seismic strengthening works identified from these assessments.

3.3.2 Pipe network

- Approximately 30 per cent of the pipe network is asbestos cement. These pipes have shown to have shorter economic lives than anticipated and many are failing prematurely.
- A "top-down" assessment of the pipe condition has provided the Council with the condition grade profile as shown in Figure 10 (where condition grade 1 indicates very good condition and pipes in condition grade 5 have failed or are about to fail). The pipe network is generally in moderate condition, and assessed to be in better condition than in 2000.

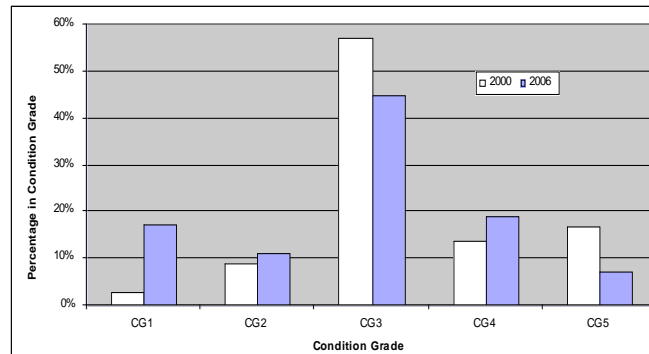


Figure 10 - Citywide condition grade profile for water pipes

- The current estimate of unaccounted for water from the Wellington system is approximately 20 per cent. District meters are to be used to analyse consumption within a zone to aid in the assessment and location of unaccounted for water.

3.3.3 Pumping stations

- Preliminary visual inspections of the 34 pump stations indicated that the assets are generally in good condition, although some minor maintenance work is required for some pump stations. Six pumping stations are programmed for renewal works to their mechanical and/or electrical components.
- Two pump stations require a starter upgrade due to risk of spare parts obsolescence.

3.4 Significant negative effects

The potential significant negative effects of the water supply activity are:

- Environmental – the effects on the environment of discharges of chlorinated water from maintenance activities or pipeline failures, including scouring, siltation and chlorine effects on sensitive watercourses. At present, the Council complies with the Greater Wellington Regional Council regulations for such discharges.
- Social
 - health and safety risks associated with the construction, maintenance or operation of the water supply infrastructure
 - property damage resulting from mains failures
 - damage to some household hot-water valves caused by corrosion by-products within galvanised iron rider mains and service connections (although this has now largely been addressed with the replacement of most of these pipes)
- Cultural – no potential significant negative cultural effects have been identified for the water supply activity.
- Economic – the economic cost to the community as a result of property damage resulting from mains failures and corrosion by-products within the water supply.

The Council mitigates these potential negative effects with balanced asset management planning activities. These include:

- asset management planning
- asset maintenance, renewal and development work
- monitoring and testing
- compliance with comprehensive environmental and health and safety procedures
- pressure management initiatives, including the use of pressure-reducing valves.



3.5 Levels of service

3.5.1 Broad approach

The Council plans to continue delivering broadly the same level of service within the water supply activity, although is continuing to introduce improvements to increase efficiency, cost-effectiveness and environmental performance through:

- developing robust frameworks to increase confidence in correct project option selection and works prioritisation
- developing a network strategic plan to progressively move towards optimising the network
- developing a water management plan, to better use existing water supplies, including strategies to identify and minimise water leakage through improved information collection, targeted maintenance and pressure management initiatives.

3.5.2 Performance measures

The contribution of the water supply activity to the achievement of the city's Community Outcomes is measured by the activity key performance measures presented in the Long Term Council Community Plan. They cover the aspects of service that are of most interest to the community and are reported in the Annual Report.

The Council has developed a number of operational measures to enable us to monitor the overall quality of the water supply activity (measures such as detailed public health, technical and cost effectiveness standards). These measures are reported on in the detailed asset management plan.

The current and future activity measures adopted, and the level of performance achieved, are shown in Figure 11.

Performance measure	Target	How we are doing
Activity measures		
<ul style="list-style-type: none"> Customer satisfaction – percentage of customers who are satisfied with work carried out (specific to the water supply operations and maintenance activities). 	07/08 75%	
	08/09 75%	
	09/10 75%	
	17/18 80%	
<ul style="list-style-type: none"> Response time to service requests – percentage of requests for service responded to within one hour of notification (response includes investigation and prioritisation of work). 	07/08 97%	
	08/09 97%	
	09/10 97%	
	17/18 97%	
<ul style="list-style-type: none"> The estimated percentage of unaccounted for water². 	07/08 19%	21%
	08/09 18%	
	09/10 18%	
	17/18 15%	

Performance measure	Target	How we are doing
Operational measures		
<ul style="list-style-type: none"> Water supplied will comply with the NZ Drinking-Water Standards. 	100% compliance	Achieved
<ul style="list-style-type: none"> The water supply systems will receive at least a Bc grading from the Ministry of Health – satisfactory, very low level of risk for the Wellington Regional Council bulk supply (B) and acceptable, low level of risk for the Wellington City Council distribution system (c). 	100% compliance	Expected to be achieved following water system regrading in 2007

Figure 11- Activity and operational performance measures

² The Council is currently considering using the infrastructure leakage index (ILI) as a performance measure. This provides guidance as to how well real losses are being managed at the current operating pressure in terms of repairs, active leakage control and infrastructure management. A possible 10-year target would be ILI<2.

3.6 Community engagement

The Local Government Act (2002) requires the Council to consult with affected and interested parties in making decisions.

The Council ensures that all interested stakeholders have an opportunity to influence level of service decisions by:

- ongoing consultation with the community regarding community outcomes as part of the LTCCP development
- consultation with the community in 2000 as part of the strategic review (for the consultation process, alternative levels of service were developed together with associated cost implications, but feedback from the community was not comprehensive)
- consultation as part of the preparation of the Assessment of Water and Sanitary Services (2005), including the consultation with Ngati Toa and the Tenths Trust, the Makara, Ohariu Valley, South Karori and Horokiwi communities, and 157 resident and special interest organisations
- making asset management plans available on the request
- newsletters distributed with rates invoices
- consulting with affected persons on specific projects (as required by the Resource Management Act 2001).

While much of the Council's consultation will continue to be done at a high level, there is a need to seek the community's view on the trade-offs necessary where there are conflicting goals. We need to establish a balance between capacity, cost and conservation of natural resources. The community may be reluctant to reduce consumption of water or to fund capital development works to produce additional capacity.

4.0 Managing our assets

4.1 Asset management model

The asset management planning process implemented by the Council is shown in Figure 12.

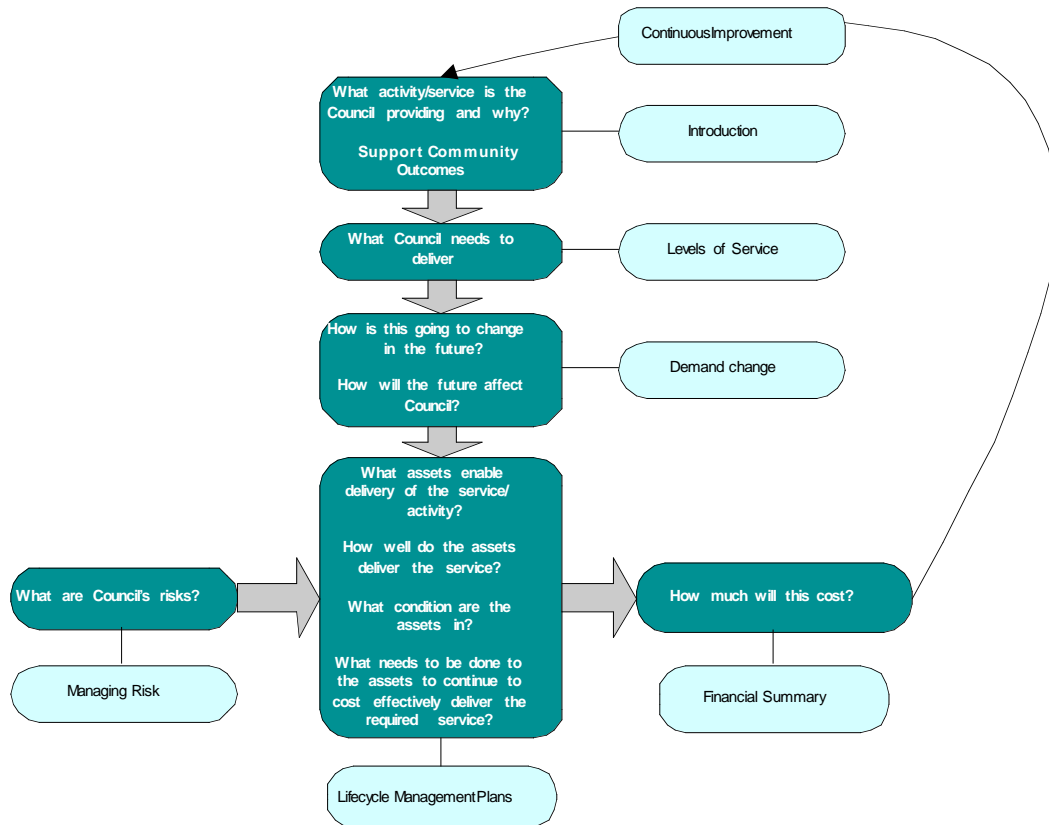


Figure 12 – Asset management planning model

4.2 Risk management

Risk management is an important part of the Council's overall water supply management approach. Management of risk associated with service levels, environmental and demand are dealt with through the strategies outlined in sections two and three and this section.

The Council's current approach to risk management can be summarised as:

- Address known high and extreme risks with new management and operational strategies and a forward programme of remedial works, with priorities based on a risk matrix system.
- Manage the current known lesser risks within the existing strategies and work programmes.
- Where risks are unknown, develop a plan to better identify and/or quantify the risks prior to implementation of risk mitigation measures.

The Council is improving its understanding of risk which includes programmes to improve asset knowledge. Works activities and associated expenditure requirements are being reviewed constantly as knowledge of these assets improves. **Error! Reference source not found.** shows management actions planned for the highest identified risks.

4.3 Operating and maintaining the assets

The operations and maintenance strategy is intended to maintain the current levels of service, mitigate risk and minimise costs by implementing a balanced programme of planned and reactive works.

Operating and maintaining the network includes responding to customer enquiries and requests for service, fixing leaks and other faults, regular flushing of the pipes and cleaning of the reservoirs. Pumping station and reservoir operations are remotely monitored using SCADA technology, and water quality is continuously monitored to ensure it meets national standards. Asset management planning, assisted by computer modelling is undertaken to better understand network performance and identify opportunities to improve this.

The risk analysis has highlighted six risks associated with managing the water supply activity, and operating and maintaining the network. Specific improvement projects have been identified to address these risks and have been programmed for implementation.

Although the Council's maintenance strategy for pipelines is mainly reactive based on the number of water service faults calls received, we operate an asset condition monitoring programme. Proactive monitoring and inspection work is performed across all pumping stations, dams, fire hydrants, and reservoirs to maintain the current level of service provided by the asset. Pipe bursts are recorded as part of a programme to improve information gathering and analysis on the pipe network's condition. Service fault notifications are monitored and analysed, and network performance reports are extracted from a SCADA system. Condition and performance information is logged on the Council asset management system (CONFIRM and Arcview - GIS) and is used for analysis to determine capacity and prioritise replacement or upgrade options. A comprehensive emergency management plan is in place for safety measures and new technologies are continuously investigated.

4.4 Asset investment and growth

The Council aims to enhance the capability and integrity of our assets at lowest long term cost and ensure inter-generational equity.

In terms of asset investment, this is largely driven by the closure of identified service gaps such as capacity shortfalls or drinking water quality issues. The Council has developed a robust framework to ensure that focus is placed on the best value projects that deliver the highest benefits per dollar spent, and that the project option chosen to close these service gaps is the best practicable option.

4.4.1 Asset renewals

Longer term asset renewal needs are identified through analysis of "desk-top" condition assessments. More detailed, shorter term prioritised programmes are developed using a priority matrix considering failure history and risk assessment (including consideration of financial, environmental and social implications of failure).

Galvanised rider mains and service connections, and unlined cast iron and steel pipes are targeted for replacement as they are identified. In the case of reservoirs, dams and pumping stations, visual condition assessments and site inspection information are used.

4.4.2 Asset development

Upgrade works required to close service gaps are primarily identified as a result of risk assessments (undertaken as part of the public health risk assessment and water services assessment), targeted performance investigations and analysis of options to mitigate identified risks. Identified upgrade works include the construction of new assets (pipes, reservoirs and pump stations), increase in the size of existing assets, and the installation of water meters to enhance the Council's ability to control and manage the network.

We use a computer model to comprehensively evaluate the capacity and performance of the existing network and the effectiveness and value of proposed remedial actions. We will apply the model outputs into our planning, design and works activities to improve the present system's performance and help identify actions required to ensure the agreed level of service meets changing future demand in the most cost-effective way.

Pipelines no longer required to transport drinking water and are not being physically replaced are marked as "disused" on records. These pipes are kept intact where possible as the Council or others may use these again in the future.

5.0 Financial information

5.1 Financial forecast

The consolidated 10 year financial forecasts for the water supply activity are presented in Figure 13. The consolidated financial forecast is included as an attachment.

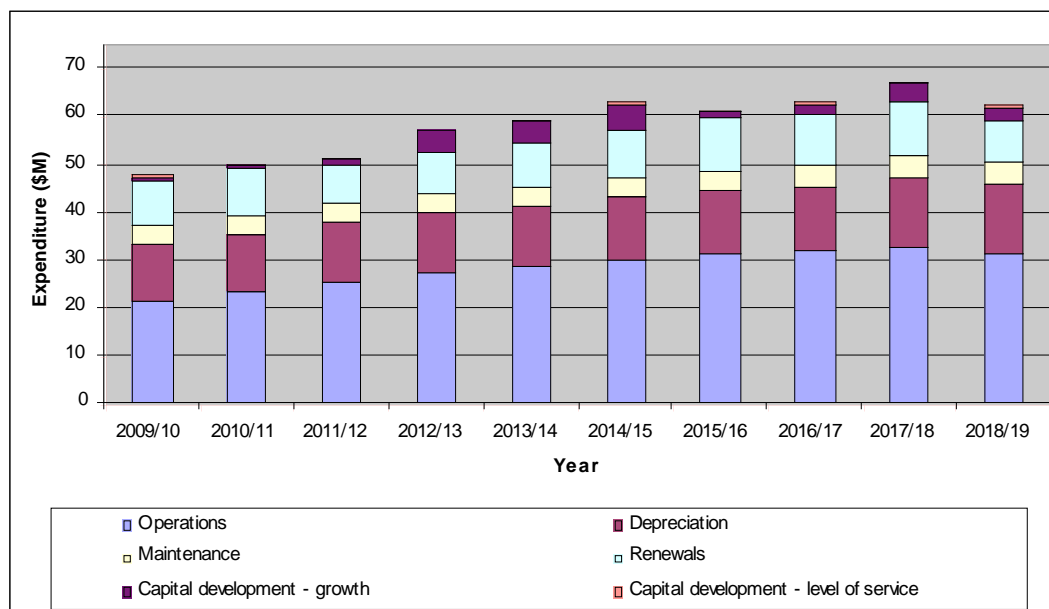


Figure 13 - Consolidated financial forecast

The key trends in the 10 year financial forecast are:

- Operations and asset management – increases to peak at \$32 million per annum in 2015/16. This reflects significant incremental increases in the interest allocation to reflect the level of investment in capital works and marginal increases in asset management planning and monitoring budgets. Depreciation also increases marginally, reflecting this capital investment.
- Bulk water supply – \$12.6 million per annum is provided for bulk water purchases from the Greater Wellington Regional Council.
- Maintenance – an increase over the planning period from \$3.4 million reflects additional maintenance needs as the network ages.
- Renewals - \$104 million is budgeted over the period 2009 to 2018 for water supply asset renewals. Seventy-nine per cent of this expenditure is targeted at reticulation renewals, with 14 per cent and 8 per cent targeted at reservoir and pump station renewals respectively. There are several major projects identified in the short term, with renewals expenditure forecast to reduce towards the second half of the planning period.
- Capital development for growth – \$16.5 million is budgeted over the period 2007 to 2018 for pump station and reservoir upgrades, and an on-going programme of water pipe capacity upgrades has been budgeted at \$0.3 million per annum
- Capital development for level of service – an ongoing programme of area water installation (\$250,000 per annum) is planned to enhance network monitoring and control.

5.2 Assumptions and data confidence

5.2.1 Assumptions

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

- All expenditure is stated in dollar values as at June 2008 with allowance made for inflation over the 10-year planning period. They will be inflation-indexed in terms of the BERL economic forecast index for the water industry, as recommended by the Audit Office, prior to finalising in the LTCCP.
- The rate and pattern of urban growth and development continues as assumed and noted within Section 2.2 of this plan.
- Maintenance costs are based largely on historical expenditure and assume there are no significant changes in contract rates (above the rate of inflation). Impacts of fuel tax are still being assessed and will be included in updated financial forecasts in subsequent versions of this plan.
- Maintenance and renewal allocations have been based on preserving current levels of service, and expenditure levels have been increased to match the growth of new assets and achieve the target levels of service noted in Section 2. No significant optimisation works have been allowed for, pending the outcomes of the planned network optimisation work as part of the development of the network strategic plan.
- Remaining lives for pipeline renewals planning are based on a top-down condition assessment and assumed deterioration profile.
- Repairs exceeding \$10,000 are capitalised as a renewals item.
- A 3 per cent levy to bulk water purchase rates from 2007/08 currently applied by the Greater Wellington Regional Council to provide capital to develop a new raw water source is included in the forecast.

5.2.2 Confidence levels

The short term forecasts have been assessed as being reliable based on the grading system from the NZ Guidelines for Infrastructure Asset Grading Standards. The most significant potential changes to the financial projections shown will result from:

- changes in the desired level of service and service standards from those identified in this asset management plan, particularly consent and other regulatory or legislative requirements
- assumptions have been made as to the average useful lives and average remaining lives of the asset groups based on current local knowledge and experience, historical trends, and predictive modelling outputs (these need to be reviewed and the accuracy improved based on real time assessments of asset deterioration – review of the effective economic life of pipeline assets has the potential for greatest variance in future cost predictions)
- changes in unaccounted for water, particularly leakage from aging pipe network
- changes in contract rates above inflation due to market or other external influences.

5.3 Development contributions

Development contributions for the water supply activity are levied to recognise the investment required for:

- The ongoing citywide upgrade of the capacity of water supply network pipes and pump stations. A proportion of pipe renewal expenditure is assigned to growth to recognise the additional capacity provided in these projects to cater for future growth in demand.
- Capital works to provide additional reservoir and pump station capacity for specific catchments.

5.4 Funding the water supply activity

The activities undertaken in order to provide the water supply service are funded as described below:

Operating expenditure

- Who benefits:
 - Identifiable parts of the community – 75 per cent.
 - Whole community – 25 per cent.
- Who pays:
 - User charges – 0 per cent.
 - Base (residential sector) – 60 per cent.
 - Commercial sector – 40 per cent.
- Funding mechanism:
 - Residential targeted rates - 60 per cent.
 - Commercial targeted rates – 40 per cent.

Capital expenditure

- Renewal and rehabilitation:
 - Funded from depreciation (an operating expense funded from rates). Any annual surplus depreciation is used to repay borrowings.
- Capital development (level of service enhancement):
 - Primarily funded from borrowings.
 - Contributions from third party capital subsidies.
 - Contributions from restricted or special funds where applicable. This is decided on a case-by-case basis.
- Capital development (growth):
 - Primarily funded from development contributions.
 - RMA-based financial contributions will continue to be used in some circumstances.
 - Contributions from borrowings.

