

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

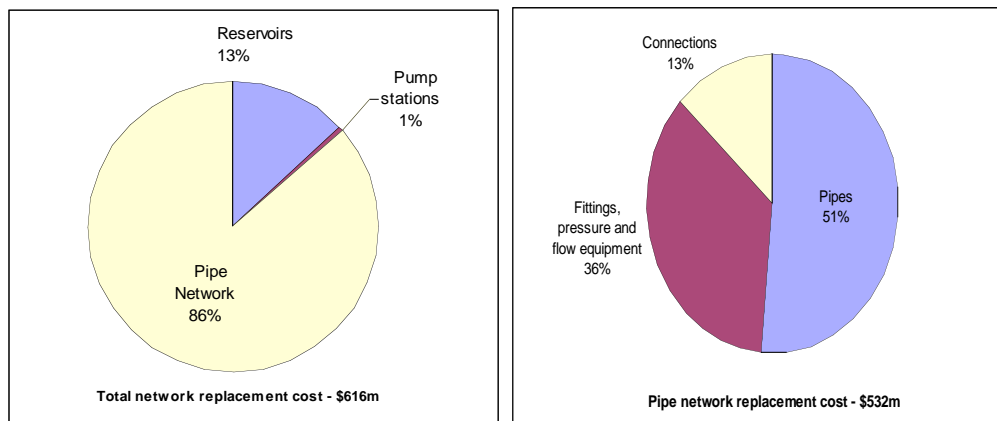


Figure 6 - Water supply asset description by replacement cost

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.

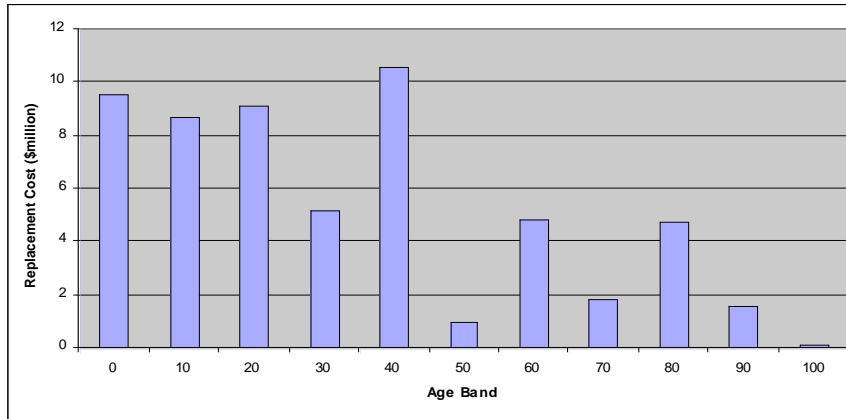


Figure 7- Reservoir age profile

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.

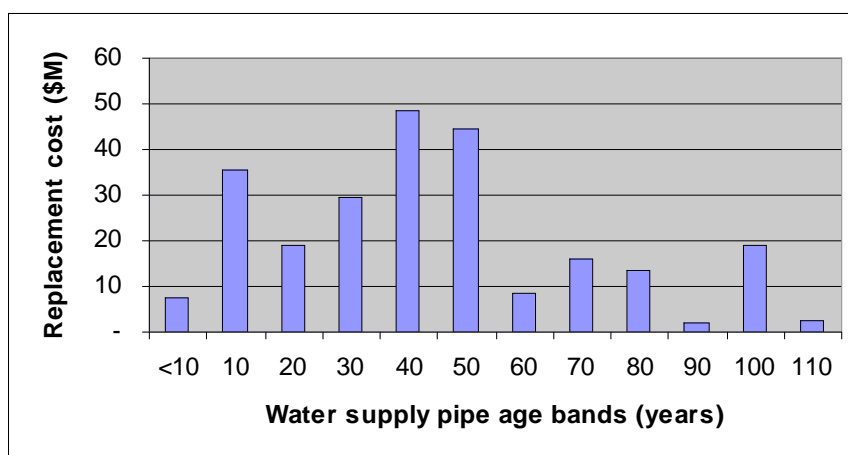


Figure 8- Pipe network age profile

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.

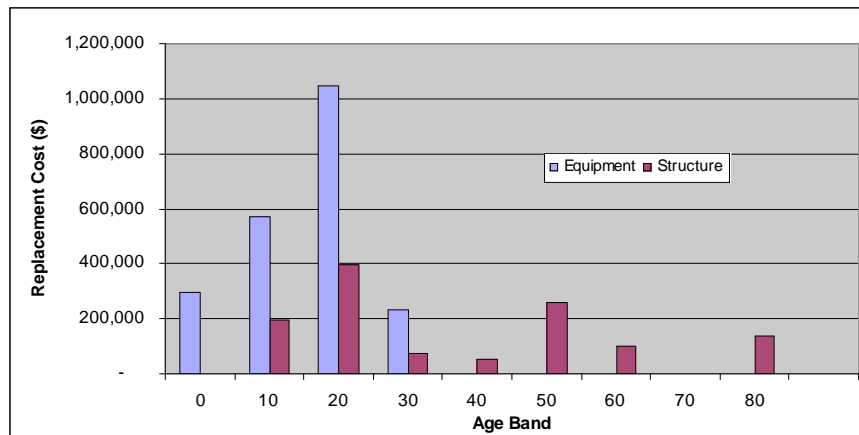


Figure 9- Pumping station age profile

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.
- 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.

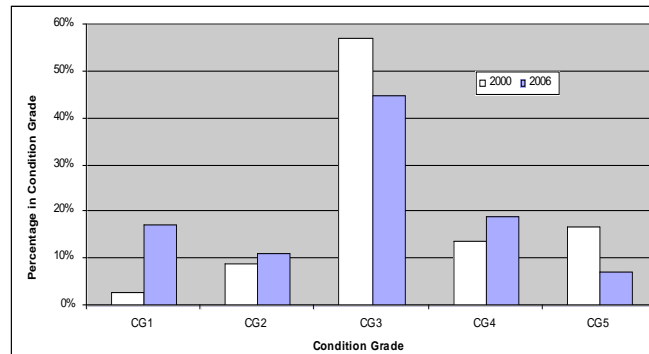


Figure 10 - Citywide condition grade profile for water pipes

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.