Wellington Water

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Bulk water supply improvement projects report

For the year ended 30 June 2015

Your public water company

Introduction

This report outlines progress with key improvement projects (KIPs) and environmental improvement projects (EIPs) for the bulk water supply function of the Greater Wellington Regional Council (GWRC) for the year ended 30 June 2015, as part of its quality and environmental management systems reporting.

Background

Since 19 September 2014, Wellington Water has managed the bulk water supply function of GWRC under a service delivery contract. This includes maintaining management systems' certification.

On transfer of the bulk water supply function to Wellington Water, GWRC operated management systems with certification to the international standards ISO 9001, for quality management, and ISO 14001, for environmental management.

For 2014-15, quality and environmental management systems performance reporting for bulk water supply was split between "business as usual" work, measured via annual performance targets (APTs), and "improvement" work, measured by progress with an annual programme of key quality and environmental improvement projects.

Performance of GWRC's APTs is part of Wellington Water's mandatory performance reporting and is covered from pages 36-39 of its Annual Report 2014-15 (available on the Wellington Water website).

The following table describes progress relative to targets for the annual programme of key quality and environmental improvement projects.

Key improvement projects 2014-15

Project name	Primary objective supported	2014/15 target	2014-15 result
Cathodic Protection	Sustainability (being cost-effective)	Complete the preliminary design for the pipe section between Cruickshank and Haywards. Wellington Water is progressively implementing a programme of cathodic protection and stray current mitigation improvements for the bulk water supply network. The improvements will help to protect key pipeline assets from corrosion and extend their economic lives. Improvement works are proposed for the following pipe sections: Cruickshank to Silverstream, Silverstream to Haywards, Haywards to Takapu Rd, Naenae to Tunnel Grove, Tunnel Grove to Korokoro and Korokoro to Thorndon.	**Partially achieved** A preliminary design report was completed for the pipe section from Cruickshank to Silverstream (around 80% of the originally intended length through to Haywards). Field investigations during 2014/15 showed a significant loss of cathodic protection current at the Silverstream bridge, which would negate the worth of extending the system past this point. A parallel investigation of options for replacing the end-of-life pipe on Silverstream bridge indicated the preferred option was to realign the pipe downstream of the bridge. Extension of the cathodic protection system from Silverstream to Haywards will be finished after construction of the Silverstream bridge pipe replacement in 2017/18.
Emergency Water Storage Investigation, Miramar	Continuous and secure water supply	Determine the feasibility of constructing emergency water storage in Miramar to supply forecast need. Project costs to be within a target range of +/-35% of forecast This project investigates a potential alternative to the proposed Wellington cross-harbour pipeline. This is one of several options to reduce the forecast shortfall between available water from the bulk supply for distribution and community need following a major Wellington fault movement, identified by the Wellington Lifelines Group in 2012 Prior to 2014/15, GWRC had identified Miramar peninsula as having several potential sites (for further investigation) for emergency water storage for Wellington's Eastern Suburbs. GWRC's Annual Plan 2014/15 included improving resilience by *Investigating sites for possible emergency water storage*, and this project as a specific area of work	**Achieved** A feasibility report was completed, with cost estimates within target bounds
Cross-harbour Pipeline Feasibility	Continuous and secure water supply	Determine the feasibility of constructing the pipeline and it being able to supply forecast need for emergency water. Project costs to be within a target range of +/-35%	**Achieved**

Study		This is one of several options to reduce the forecast shortfall between available water from the bulk supply for distribution and community need following a major Wellington fault movement, identified by the Wellington Lifelines Group in 2012 GWRC's Annual Plan 2014/15 included improving resilience by *Assessing the viability of a new pipeline across Wellington Harbour, which could deliver water from the Wainuiomata and/or Waterloo sources directly into Wellington city*, and this project as a specific area of work	A feasibility and options report was completed. Further work has been undertaken to plan out the forward work programme. Cost estimate of options within target bounds
Increased Standby Power Capacity	Continuous and secure water supply	Receive and commission four 220KVa mobile generator sets capable of powering the Waterloo well-field variable-speed drive (VSD) pumps, to increase the security of water supply during power outages A significant proportion of the bulk water network's pumping stations rely on mobile generators for back-up power in the event of power outages. The two existing mobile generators are aging, costly to maintain and do not provide sufficient power for the Waterloo well-field VSD pumps. Providing increased mobile generator capacity that can run the well-field VSDs is a key risk mitigation measure within GWRC water safety plans	**Partially achieved** The generators were purchased. Commissioning will occur in 2015/16
Upper Kaitoke Intake Level of Service Options and Feasibility Study	Continuous and secure water supply / Sustainability (being cost-effective)	Conduct a feasibility and options study to identify the long-term operational requirements of the Kaitoke water-intake network and how planned short-term investments tie in with the long-term plan. The report will identify further capital works options and concept costs to meet the long-term operational requirements identified The upper Kaitoke network consists of the water intake and transmission system delivering water into the Te Marua Treatment Plant.	**Achieved** A feasibility and options report was completed. Identified options are being reviewed. Long-term funding plans and a capital works programme will be put in place in 2015/16
Ngauranga Reservoir Overflow Discharge Pipeline Extension	Environmental aspects are minimised	Design and receive consent for a new overflow and outfall system for Ngauranga Reservoir that is compliant with the Regional Plan and so able to be used without causing scouring and erosion. (Construction scheduled for 2015/16)	**Partially achieved** The design was completed and consents applied for, however consents had not been approved by 30 June 2015
Sustainable Yield Model (SYM) Upgrade to include Sea-level Rise	Continuous and secure water supply	Modify the SYM by 30 June 2015 to allow planning to start on mitigation of the adverse environmental effects of sea-level rise on the Waiwhetu aquifer The SYM is a strategic planning tool used to assess the reliability of the bulk water supply system to meet service level targets under a range of future demand scenarios	**Achieved**
Replace the Wainuiomata Water Treatment Plant's Program Logic	Continuous and secure water supply	Two-year project. For 2014/15, design software and purchase electrical components. The PLC will be replaced with a common-component system (as used at other GWRC treatment plants) and commissioned in 2015/16	**Achieved**

Controller (PLC)			
Riverstone Terraces Direct-supply Pipeline	Continuous and secure water supply	Construct and commission a new bulk water main to the Riverstone Terraces reservoir (Upper Hutt), to reduce low-pressure issues caused by the current reservoir supply arrangement via a pumping station and local reticulation (reduction in low pressure incidents to be measured over three years)	**Partially achieved** Construction was 98% complete by 30 June 2015. Work to be completed 2015/16
Silverstream Bridge Pipeline Condition Assessment and Realignment Options Feasibility Study	Continuous and secure water supply / Sustainability (being cost-effective)	Conduct an options report to assess the relative merits of replacing the Kaitoke bulk water main across Silverstream Bridge and realigning the main off the bridge, assessing risk and cost for each option and recommending a preferred option. A condition assessment of the pipe section on the bridge has identified that it is nearing the end of its useful life. Replacement will cost in the order of $1 million, but not address the risk of failure in the event of a major Wellington fault movement, due to the proximity of the bridge to the fault line	**Achieved** A feasibility and options report was completed. The preferred option is included in GWRC's long-term plan 2015-25
Structural Assessment of Water Supply Buildings 2014/15	Continuous and secure water supply	Assess all critical bulk water supply structures (IL 3 and IL 4) for their seismic performance as a percentage of the new building standards (NBS). (Year three of a three-year programme)	**Achieved**
Seismic Strengthening of Water Supply Buildings 2014/15	Continuous and secure water supply	Upgrade the main water treatment plant buildings (except for the filter gallery at Te Marua and the centrifuge building at Wainuiomata) to 100% of the new building standards (NBS), to reduce the risk of structural failure following a seismic event GWRC's Annual Plan 2014/15 included improving resilience by *Earthquake strengthening of water supply buildings and above-ground structures*	**Achieved** All specified treatment plant buildings have been strengthened to IL4 100% NBS
Te Marua Water Treatment Plant Filter-to-Waste Improvement	Water is safe and pleasant to drink	Upgrade the filter flow controls at the Te Marua treatment plant and complete programming and commissioning. (Year two of a two-year programme) This work improves our ability to reliably achieve the full rated flow of water through the filters and enables water to be diverted directly from the filters to waste if it doesn't meet the drinking-water standards	**Achieved**
Telemetry IP Based Repeater Installation	Continuous and secure water supply	Install and commission a telemetry IP communications network by the end of 2015/16 (providing 20 times the existing data transfer rate[1]), to minimize the risk of a communications/control failure with critical elements of the water supply network following a seismic event. (The existing system is 20 years old, uses old technology, is vulnerable to single-point failures and has limited data transfer rates.) GWRC's Annual Plan 2014/15 included improving resilience by *Putting in place a back-up water supply control and communications system*, and this project as a specific area	**Achieved** The project was constructed and commissioned in 2014/15 Data Doubled as of late June, 20 times plus will be at completion of analog to digital radio, 3 years out for some councils.

1 This project was led by staff from GWRC's water supply group on behalf of Wellington Water's five shareholding councils. Data transfer speeds had doubled on completion of the new dedicated data network. Data transfer rates of 20 times the pre-upgrade rate will become available once all councils upgrade analog radio equipment to digital technology, which is expected to occur within three years

		of work	
Touch Voltage protection on Pipelines	Our people are safe and productive	Construct a ground-rise potential (touch voltage) protection system for the bulk water network to minimize the risk of electric shock to workers and the public from induced currents on the bulk water mains (Year one of a two-year programme)	**Not achieved** The project was placed on hold while further risk analysis work is carried and the design is reviewed

Environmental improvement projects 2014-15

Project name	Primary objective supported	2014/15 Target	2014-15 Result
Ngauranga Reservoir Overflow Discharge Pipeline Extension	Environmental aspects are minimised	Design and receive consent for a new overflow and outfall system that is compliant with the Regional Plan and so able to be used without causing scouring and erosion. (Construction scheduled for 2015/16, also a key improvement project)	**Partially achieved** The design was completed and consents applied for, however consents had not been approved by 30 June 2015
Sustainable Yield Model (SYM) Upgrade to include Sea-level Rise	Environmental aspects are minimised	Modify the SYM by 30 June 2015 to allow planning to start on mitigation of the adverse environmental effects of sea-level rise on the Waiwhetu aquifer (also a key improvement project)	**Achieved**
Riverstone Terraces Direct-supply Pipeline	Environmental aspects are minimised	Construct and commission a new bulk water main to the Riverstone Terraces reservoir. This key improvement project for security of supply will also reduce power usage and related carbon emissions by removing the need to run the Moonshine pumping station routinely in order to maintain supply pressure to Riverstone Terraces	**Partially achieved** Construction was 98% complete by 30 June 2015. Work to be completed 2015/16
Atakapa Stream Pipeline Protection	Environmental aspects are minimised	Stabilise a section of the Atakapa Stream bank where the stream has eroded and undermined a section of bulk water pipeline, to stabilize the bank and prevent further erosion and silt deposition into the stream. The project includes some minor planting of the stream bank	**Achieved**