

WELLINGTON WATER

THREE WATERS REPORT AND OUTLOOK
FOR THE QUARTER ENDED
31 DECEMBER 2014

Welcome. This is our second Three Waters report and it includes some new information, thanks to your feedback on the first report.

The quarter was a very busy one for the company. We completed the merger of Capacity and the GWRC bulk water team; we reorganised the company into one efficient structure; and we appointed our new senior leadership team. With all this done, we are really looking forward to 2015.

Our strategy is simple: to look across all the work of our client councils and identify work that can be progressed on a regional basis (i.e. once for all). We identified four areas of work during 2014 that suit a regional focus and we have approval to advance these initiatives. They are:

- Develop our first-generation regional asset management plan for 3 waters
- Take a network-wide approach to the provision of seismically-resilient infrastructure
- Improve stormwater quality in two catchments, i.e. Porirua and Hutt
- Develop integrated plans promoting community education across the 3 waters function.

We look forward to keeping you up-to-date on progress with these.

Colin

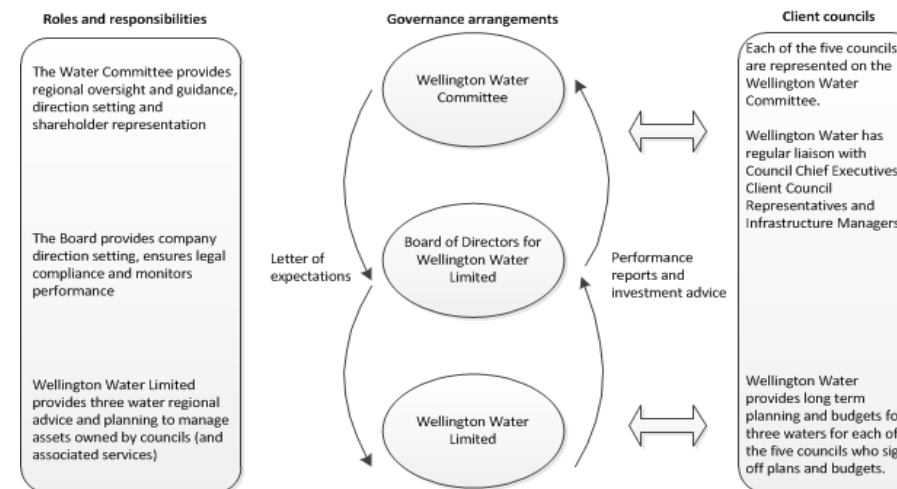
Colin Crampton, CE
Wellington Water Ltd



The Hutt River at Maoribank, Upper Hutt, looking upstream



How Wellington Water works



Wellington Water is a council owned organisation jointly owned by the Greater Wellington Regional Council, Hutt City Council, Porirua City Council, Upper Hutt City Council and Wellington City Council.

The Three Waters Report and Outlook is a quarterly report designed to inform the Water Committee, and through them the public, of outcomes and regional issues relating to the three waters (drinking, storm and waste water), and our organisational performance.

Contents

Our operating conditions	> Pg 2
Outcome 1. Safe to drink	> Pg 3
Water supply network and outlook	> Pg 4, 5
Outcome 2. Respectful	> Pg 6
Wastewater network	> Pg 7, 8
Natural resources	> Pg 9
Outcome 3. Resilience	> Pg 10
Network and supply	> Pg 11, 12
Health and safety	> Pg 13
Programme delivery	> Pg 14

Our regional three waters initiatives confirmed

We're founded on the knowledge that a regional approach to three waters asset management will give client councils the best long-run value from their investment.

During the quarter we made good progress identifying and agreeing the key regional issues that will help us deliver that value.

We consulted the Water Committee, client council officers and councillors on seven priorities. Feedback helped us narrow these to four:

1. Regional Asset Management Plan.

Initiate a three waters plan to bring consistency and optimal investment across the region.

3. Freshwater catchment management.

Provide technical advice to support Whaitua (catchment) committees. Whaitua committees are being established under the draft Natural Resources Plan for the region to oversee water quality and allocation issues within each catchment.

2. Seismic resilience.

Develop a network-wide programme to ensure the community has access to sufficient water after a disaster.

4. Community education.

Address how community behaviour impacts on the network. This will support community aspirations to improved environmental outcomes, as well as achieve lower operating expenses.

Next, we will prepare high-level work programmes to inform investment planning for the 2018-28 long-term plan period.

Stable conditions see steady progress

Good weather and stable market conditions in the quarter mean there has been little external impact on our work programmes.

Suppliers advise the Christchurch rebuild is having only a minor impact on our contractors' ability to perform work in our region. Our project managers report solid numbers of tenders for work offered in the quarter, with an average close to four.

Fine weather generally means increased demand for water. Heading into summer, drinking water supply indicators were good, with the newly enlarged lakes full and average rainfall forecast. The record dry January tested that resilience. Demand steadily tracked upward as garden watering increased, but the rivers and aquifer stood up well and base level watering restrictions were adequate heading into February 2015.

Councils reported growth indicators including building consent applications were showing a slight increase year on year. This growth was reflected in our own indicator, new water connections (see graphic on page 3)

There were no significant developments in the wider legal or operating environment that we expect to have any impact on our business in the short to medium term.

Hutt City reports a 16% increase in building consent applications by value, for 2014 over 2013.





Water quality standards met this quarter

There were no unusual factors affecting water quality in the period 1 October to 31 December 2014.

We get taste and odour complaints occasionally as a result of work being done on the network, and more often when we switch to lake supply in areas usually fed by aquifer water.

With water supply conditions on the dry side, and broadly below-normal rainfall in the catchments, we used water from storage lakes on 28 days during the quarter.

Council contact centres reported no significant increase in complaints.

Both of the Stuart Macaskill water storage lakes were full on 31 December. Geosmin, a harmless compound that can affect taste and odour, remained present in both lakes but did not affect the aesthetic quality of water supplied.

12,568,450,000 litres
delivered to 138,000 connections

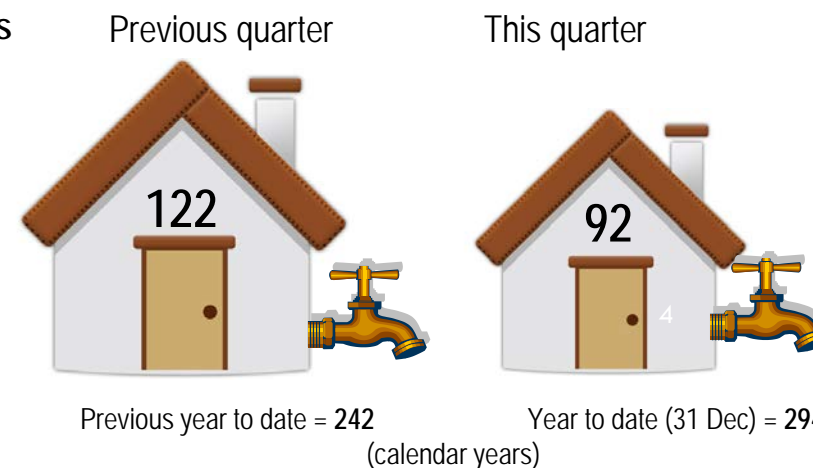
Drinking water safety

Full compliance with the New Zealand Drinking Water Standards (DWSNZ 2005, 2008) for microbiological, chemical, aesthetic and reticulation measures



New connection applications

An increase in year-on-year connections supports other data indicating an up-tick in development activity.





How water quality grading works

Water quality grading has two aspects; distribution zone, and source and treatment.

Zone grading is based on the microbiological and chemical quality of the water, network condition and the quality of the network's care.

Possible zone grades are a1 (best) to e. A zone grade cannot be higher than the lowest plant / source grade that serves that zone.

Plant / source grading is based on the likely health risks to the community from bacteria, protozoal and chemical impurities in source water making it through the treatment system.

Possible plant/source grades are A1 to E.

Grades are based on the Drinking-water Standards for NZ, and the Ministry of Health assigns a Public Health Grading for all community water supplies. Every year, a significant number in the country – mainly rural – fail.

In the Wellington region, Korokoro and Petone receive water that is not chlorinated. Under the DWSNZ, this means the source / plant (and therefore the zone) cannot receive higher than a B (and a b). Otherwise, all quality and distribution ratings are A and a.

More at www.health.govt.nz/publication/annual-report-drinking-water-quality-2013-14

Public Health Grading

Wellington Water manages supply from four water sources and treatment plants to 24 city zones.

Key:

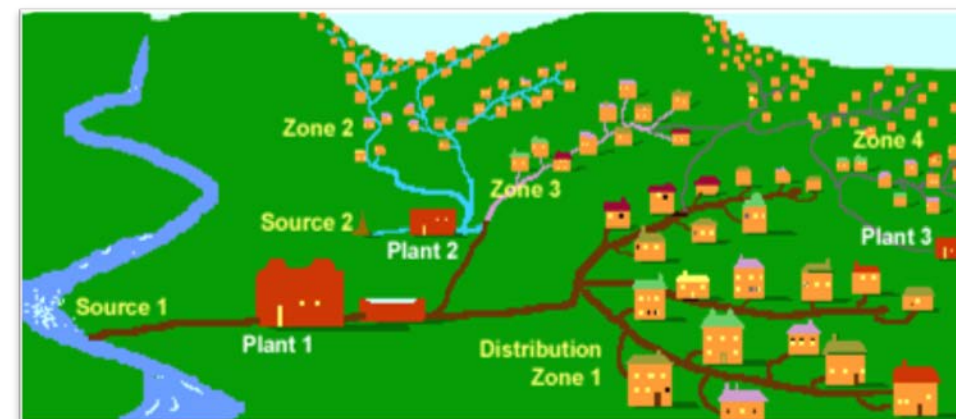
- **A1:** Completely satisfactory, negligible level of risk, demonstrably high quality
- **a:** Completely satisfactory, very low level of risk
- **B/b:** Very low level of risk

Number of Zones	Source/Plant grade	Zone grade
9	A1	a
11	A1	b
4	B	b



How gradings are organised.

If different parts of town have different water sources or conditions, then the community will be divided into two or more zones.





Progress on quality issues

One of the eight wells that provide water from the Waiwhetu aquifer (beneath Lower Hutt) to the Waterloo water treatment plant is out of service temporarily due to iron bacteria.

Iron bacteria occur naturally and are not harmful to health, but can reduce the clarity of water and so mask the presence of harmful organisms.

The well pump was removed and a well-cleaning programme carried out in January, with initial signs encouraging.

Water from the well is running clear – before cleaning its clarity wasn't sufficient to meet the drinking-water standard.

This apparent improvement is still to be confirmed by pumping from the well at high flow rates. Production from the Waterloo water treatment plant will have to be restricted for several days to facilitate that testing. January's record-dry supply conditions delayed that work, which will be done as soon as practicable.

Investigation of the possible causes of the iron bacteria are continuing.

At Te Marua, we continue to investigate the causes and treatment of geosmin.

Geosmin in lake water isn't unusual and is commonly treated with activated carbon. Water containing geosmin is safe to drink but can taste and smell 'earthy'.

Last quarter we reported having secured a more effective activated-carbon to treat the geosmin, but this hasn't lived up to expectations.

Present testing indicates that some level of taste complaints would occur if Lake 2 is used for supply. This scenario remains unlikely in the near future, as the probability of fully using Lake 1's storage in the next three months is only about 5%.

Possible management and preventative solutions include changes to water-flow within the lakes, to prevent 'calm' zones that may assist geosmin growth.



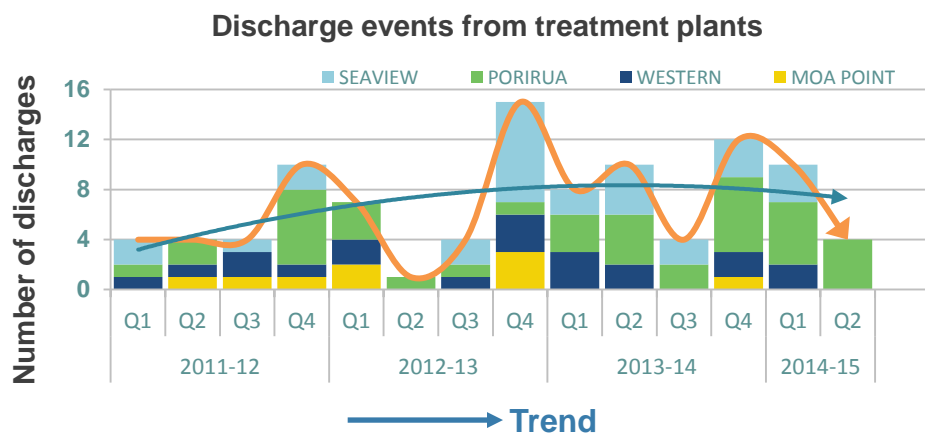
After the Waterloo well affected by iron bacteria was cleaned, the bore's pump is attached to a 16m positioning pipe in order to be lowered back into the aquifer.



Full resource consent compliance this quarter

All wastewater discharges and overflows during the quarter were associated with wet weather, and were compliant with consent conditions.

However in January 2015 there were two incidents that were non-compliant, resulting in the discharge of untreated wastewater to the coast in Porirua. We are currently in discussion with the regional council about these events and sampling regimes at the Porirua wastewater treatment plant. Full details on that in the next quarter's report.



Discharge events, or overflows, are usually created by excess rainfall entering the wastewater network due to stormwater connections to wastewater pipes.

Consent compliance 1 Oct 14 – 31 Dec 14:

Nature of work	Target	Track
Extracting water	Full compliance	
Discharging water	Full compliance	
Wastewater – dry weather overflows	Full compliance	 (No events)
Wastewater – wet weather overflows	Full compliance	 (4 events*)
Stormwater discharges	Full compliance	
How we carry out our work	No issues this quarter	

*An overflow event is permitted if it occurs as a result of wet weather. Testing is carried out to ensure water quality remains at or returns to compliant levels



Coastal water quality monitoring

No beaches have been closed for water quality reasons to date during 2014-15.

Samples from coastal bathing beaches are collected weekly during the bathing season and tested under the regional council's Marine Recreational Water Quality Monitoring Programme, and the Environment and Health Ministries' guidelines for Water Quality for Marine and Freshwater Recreational Areas.

The maps (right) show coastal water quality ratings based on five-year data averages. Three 'hot spots' have been identified: Owhiro Bay, Island Bay (Wellington) and Rona Bay (Lower Hutt).

Owhiro Bay has faecal coliform issues, and increased risk due to the rural/urban mix of this catchment. Island Bay water quality has deteriorated. Investigations have found a number of illegal cross-connections. At Rona Bay faults in both the stormwater and wastewater network have been found and fixed and water quality is now within the acceptable limits.

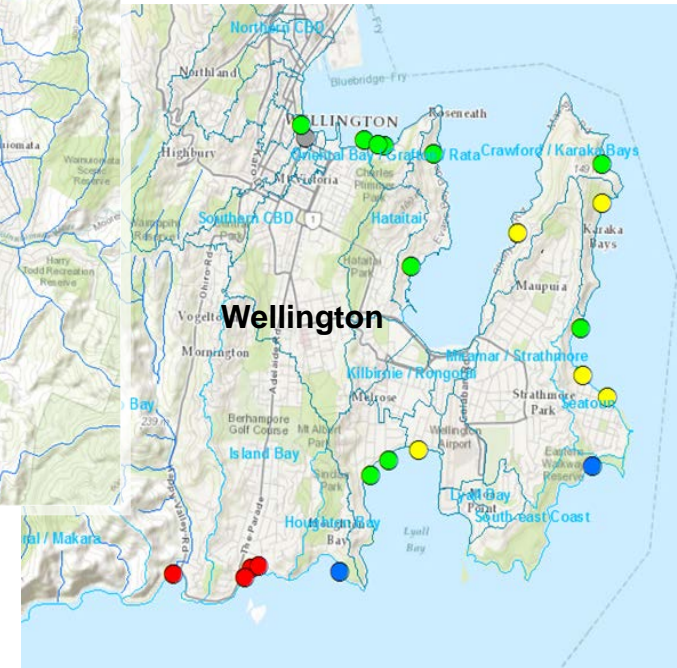
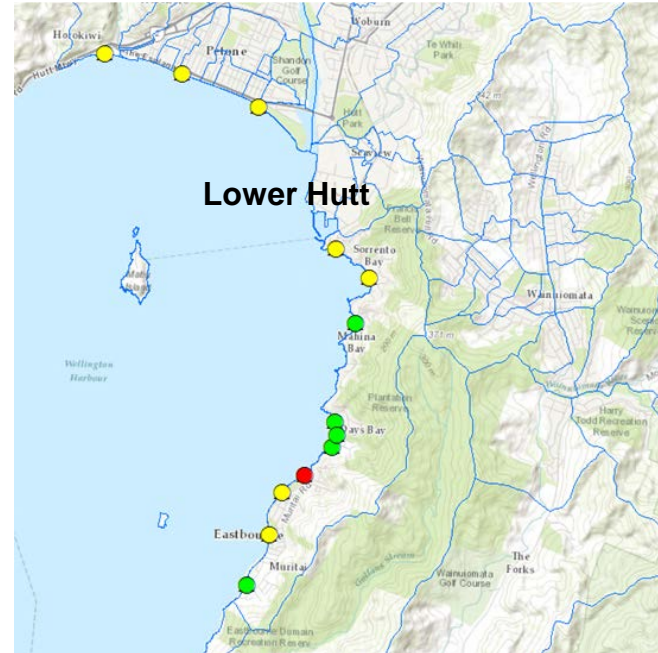
The water quality monitoring programme for Porirua Harbour is recently established. No quarterly time-series is available yet.

Rivers and streams are safe

All of 33 freshwater sites across Wellington and Lower Hutt meet water quality targets. However, the annual trend is slightly down. Monitoring in Porirua has only recently been initiated. Poor water quality at freshwater sites results from faults in the public and private sewer and stormwater network. Faults range from cross-connections to broken mains, and, as with coastal water quality, is the focus of our inflow and investigation programme.

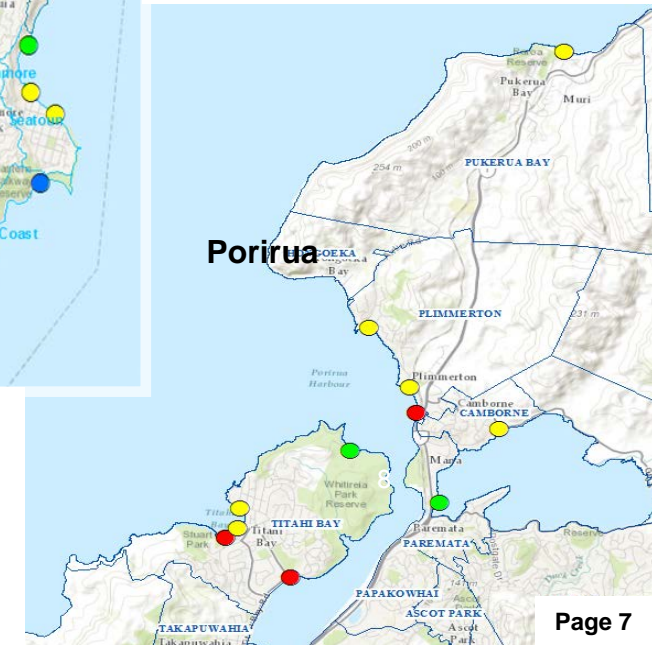
Water quality at metropolitan Wellington beaches

Based on GWRC's 5-year Suitability for Recreation grade



Key:

	Very good
	Good
	Fair
	Poor
	Not yet graded





Inflow and infiltration – inside our “I & I” programme

Water supply networks are pressurised, meaning that major leaks generally make themselves known pretty quickly. That pressure also makes it harder for unwanted substances to enter the system.

Damage and faults in wastewater and stormwater networks are harder to find. The consequences of cracks and misconnections – inflow and infiltration – are seen in increased flows to wastewater treatment plants – as rainwater flows into the wastewater network – and in



Smoke pumped into a stormwater main leaves a wastewater ventilation pipe -- evidence of a cross-connection that will be affecting receiving water quality.

faecal bacterial counts near stormwater outlets, when wastewater flows or leaks into stormwater pipes – which empty without treatment into streams and the harbour.

Our inflow and infiltration (“I and I”) programme targets repairs to wastewater and stormwater pipes, and cross-connections, to reduce these unwanted environmental impacts.

Inflow volumes at treatment plants can increase five-fold and more during heavy rain. This can cause overflows from the network and the treatment plants. Although the wastewater overflows are highly diluted, and the health risk they pose is minimal, they are not desirable.

One solution would be to increase treatment plant capacity. This would cost tens of millions of dollars. A more effective investment is to improve the wastewater and stormwater networks themselves – fixing the problem at source, so to speak. We are confident that increased spending on I and I activity would see better environmental outcomes.

A third approach is to raise awareness of the issue of stormwater diversion into the wastewater network with plumbers and DIY folk, as many of these cross connections are on private property. The kitchen gully trap is often seen as a handy place to divert a new or broken stormwater pipe.



Stormwater pipe illegally diverted to wastewater gully trap

Private stormwater downpipes diverted to wastewater gully traps are a major cause of increased wastewater network loading, and possible overflows, during wet weather.

Inflow and infiltration programmes are under way in all cities. In Wellington, they form part of the Integrated Catchment Management Plan we are developing, that takes a holistic approach to stormwater and wastewater impacts in the city’s catchments.



Summer conservation campaign builds on last year's work

This summer's promotion is a continuation of last year's successful campaign. The theme is getting people to do one extra thing to conserve water. It's designed to be an easy tweak to behaviour, and the smart thing to do.

Our research found that most people rated the 2014 promotion highly for understanding, believability and relevance. This summer's advertising campaign is scheduled to run between early January and mid-March 2015.

Watering restrictions contribute to managing daily peak demands within supply system capacities. Publicity about the restrictions in place is stepped up when agreed trigger conditions are reached.

Measure of awareness of conservation work and change in behaviour

	Latest Jun-14	Previous Jun-12	Trend
I think I should be conserving more water than I'm currently doing	68%	68%	→
I have the information I need to be able to conserve more water	73%	59%	↑
I generally make a positive effort to conserve water	48%	33%	↑

Survey results indicate information campaigns have an impact.

Wai save? A closer look at water usage and conservation

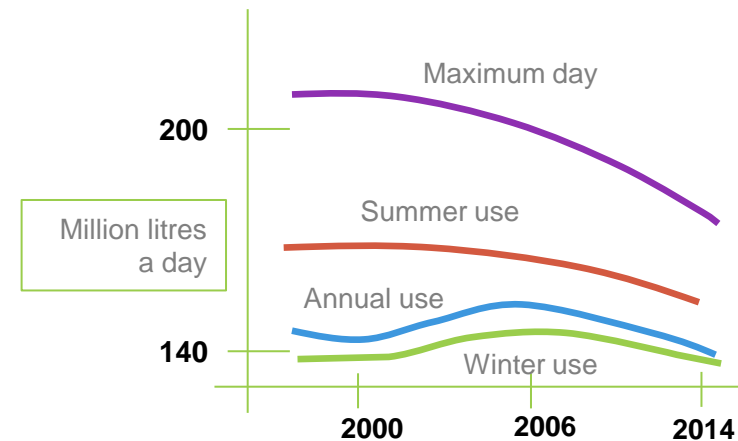
On a hot summer's day, we can go through up to 50% more water than on an average winter day. Historically, the main cause of summer peaks, and hence the main focus of conservation promotion, has been outdoor water use.

A summer focus for water conservation activity is important because very high daily peaks (over 200 million litres a day) can come close to our capacity of assets. In addition, dry conditions and persistently high demand over several weeks require the use of stored water. Extended dry periods may raise the prospect of a water shortage. We model the long-run risk of water shortage to inform investment timing for new water supply capacity.

Recently, summer demand has tailed off to sit from 7-14% greater than winter demand. This figure can still fluctuate widely however.

The graph (right) shows trends in four measurements of water use. The winter or base level shows a gradually increasing trend until 2006, and a decline since then. In contrast, summer water use in the summer and peak or maximum day periods show a decline since the late 1990s, with the rate of decline increasing after 2006.

Water demand trends






Water use shows a declining trend across all seasons, with the winter to summer margin also decreasing.



Network performance on track

There were no major performance issues during the quarter.

Key:

-  On track
-  Minor concern
-  Concern

Median response times: Hours to attend or resolve an issue

WATER SUPPLY

URGENT CALL OUTS

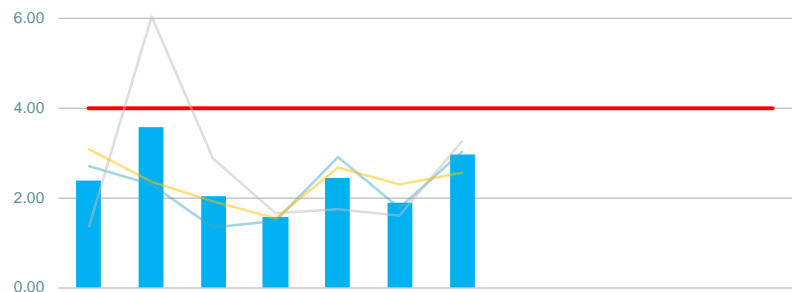
The median response time to **ATTEND** an urgent event in Jan-15 ranged from

0.38 hrs to 0.62 hrs

This is **UNDER** the 1hr threshold



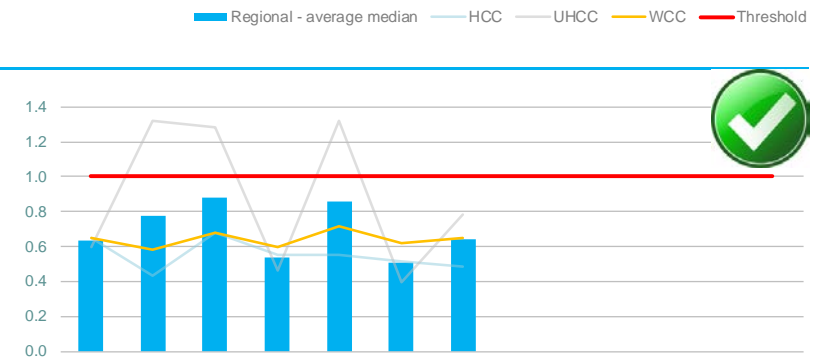
...And we **RESOLVED** these incidents quicker than threshold:



Resolution of urgent callouts

	Jul	Aug	Sep	Oct	Nov	Dec	Jan					
Regional - average median	2.38	3.57	2.05	1.57	2.44	1.89	2.95					
Threshold	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

STORMWATER



Response time to attend a flooding event

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Regional - average median	0.63	0.78	0.88	0.54	0.86	0.51	0.64					
Threshold	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

WASTEWATER

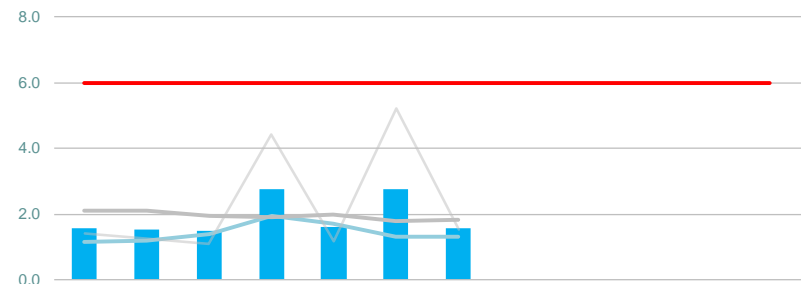
The median response time to **ATTEND** an overflow event in Jan-15 ranged from:

0.43 hrs to 0.62 hrs

This is **UNDER** the 1hr threshold



...And we were better than target in **RESOLVING** these incidents:



Resolution time for wastewater overflows

	Jul	Aug	Sep	Oct	Nov	Dec	Jan					
Regional - average median	1.56	1.51	1.48	2.76	1.62	2.77	1.54					
Threshold	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00



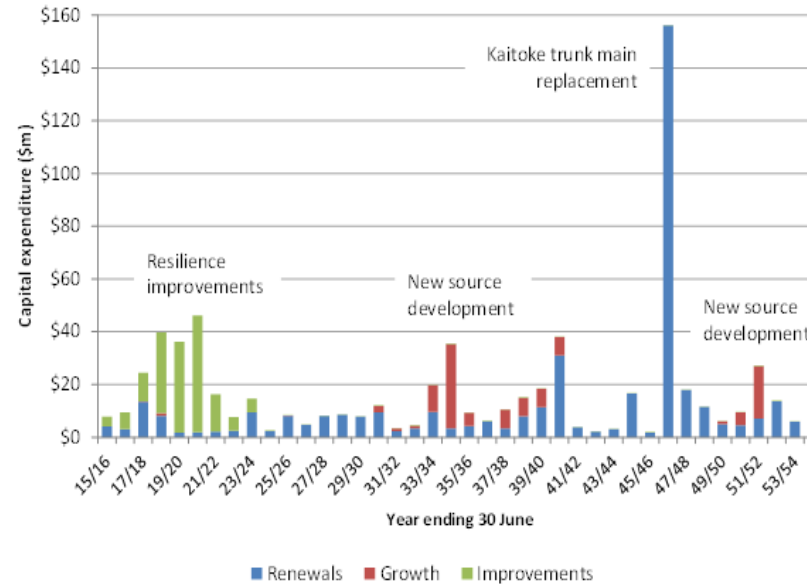
Renewals forecasting: saving for a rainy and a dry day

Bulk-water capital works

Capital spending for bulk water renewal follows cycles, with more significant investment needed as key assets reach end-of-life. The next major renewal phase is due to replacement of the Kaitoke trunk main (mid-late 2040s).

The timing for growth-related spending is sensitive to changes in water demand and population growth. Since 2006, per-capita water use has fallen at a greater rate than population growth, giving an overall reduction in average and peak supply volumes. The reduced demand has resulted in deferral of the next major source development to the mid 2030s.

Since the Canterbury earthquakes in 2010 and 2011, new information has become available about the likely effect of a major earthquake on water supply infrastructure. Options have been reviewed to significantly improve the resilience of the bulk supply including construction of a cross-harbour pipeline and emergency water storage near Porirua. The proposed \$150 million investment in resilience over the next 10 years would add significantly to GWRC debt, which would need to be funded through increases in the bulk water levy. This is subject to public consultation through the GWRC long term plan process.



Bulk water 40-year capital spending forecast

The bulk-water capital spending forecast has three notable spikes: to provide for network resilience improvements, new water supply capacity, and replacement of the Kaitoke-Karori pipeline at its forecast end of life.

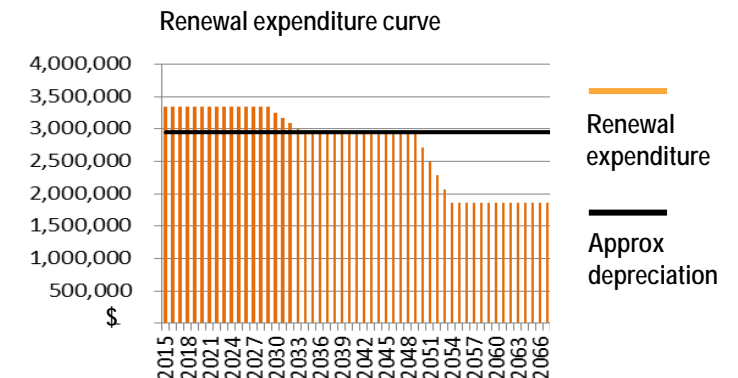
Renewal forecast curves are produced as part of the asset management plan. They help councils spread costly but necessary investment in infrastructure.

Three waters renewals

Unlike the bulk water renewals, the renewals for the water supply, wastewater and stormwater pipes are spread out more. The timing for the renewals are linked to when the area was developed, pipe material and the condition of the pipes.

There are peaks in the renewal funding requirements but not to the same extent as bulk water due to the size and length of these pipes. Wellington Water collects information on the condition of the pipe assets to allow informed renewal decisions to be made.

Previous methods involved replacing pipe based on their age, we now look at their condition and replace pipes when they need to be to maintain levels of service. Following is an example of a renewals forecast based on the condition of the asset.





Where our water comes from Treatment plants and supply areas

Gear Island (Lower Hutt)
Standby water treatment plant only
Share of annual supply: <1%

Waterloo
(Lower Hutt)

Normally supplies to:
Lower Hutt (excluding Wainuiomata and Stokes Valley) and, together with Wainuiomata supplies Ngaio, Onslow, Khandallah and central, southern and eastern Wellington

Share of annual supply:
40%

Te Marua
(Upper Hutt)

Normally supplies to:
Upper Hutt, Stokes Valley, Porirua, northern Wellington (to Karori, excluding Ngaio, Onslow and Khandallah)

Share of annual supply:
45%

Wainuiomata

Normally supplies to: Wainuiomata and, together with Waterloo, supplies Ngaio, Onslow, Khandallah, central Wellington and its southern and eastern suburbs

Share of annual supply: **15%**

Water treatment resilience upgraded

A resilient community plans for the future, adapts to change and is prepared for emergencies.

Resilient water systems that we manage for councils are fit for and able to provide an agreed level of service, now and in future, with plans to deal with the unexpected.

Structural strengthening work has recently been finished on the main water treatment plant buildings at Te Marua, Wainuiomata and Waterloo treatment plants.

The buildings are considered critical lifelines infrastructure, so must – in accordance with the Civil Defence Emergency Management Act – be able to function to the fullest extent possible during and after an emergency, even though this may be at a reduced level.

They have each been strengthened to 100% of the 2002 National Building Standard's highest importance level (IL4).

The project, costing \$1.2 million, was completed in November 2014 on time and within budget.

This work is part of a wider project for the bulk water network, which involves seismic assessments of all bulk water buildings and structures in relation to the 2002 standards. All remaining buildings have now been assessed. A prioritised upgrading programme is in development.



Structural strengthening of the Waterloo treatment plant's motor hall

Health and Safety leadership

Our vision for health and safety performances is that “Our people, suppliers and affected parties go home healthy and safe.” To help bring our vision to life, we’ve convened the 3 Waters Safety Forum. This forum will act as a steering group for what we hope will be a joint effort by all suppliers to the water services industry in the Wellington region to improve safe practice and performance.

Industry forum members are Ian Martin (Aecom, representing consultants), David Howard (CCL, representing contractors), Derek Falve and Valitha Roos (Veolia) and Paul Coles (City Care).

Wellington Water is represented by our CE, Health and Safety manager, GM of Network and Customer operations, and Manager of Treatment Plant Operations.

Key objectives for the forum are to build engagement across the sector, and develop a culture that supports productivity through safe workplace behaviours.

Three early focus areas for the forum are:

1. Develop communication channels.
2. Develop sector-wide performance measures
3. Agree on personal protection equipment (PPE) minimum standards for work with Wellington Water.

The 3 waters Health and Safety Forum newsletter has been developed to spread the word with our consultants and contractors.



New performance measures help raise awareness

A key performance target for Wellington Water is to improve incident reporting across the sector. We’ve been working over the past quarter on a suite of six safety measures that will incorporate our own performance with that of our contractors and consultants.

The measures are: all incidents; recordable injuries; medical treatment incidents; first aid injuries; lost time injuries; hours lost to illness.

Wellington Water will be able to collect much of this information due to its influence across the region, and the leadership of the 3 Waters Health and Safety Leadership Forum. Through this forum risks can be identified and solutions developed and implemented.

We expect that contractor reporting totals will be variable based on the number of contracts in progress each month but should show a steady increase over time.

Consultant reporting is expected to remain relatively low in comparison due to the lesser risks consultants are exposed to.

As awareness develops it is expected incident numbers reported will increase but not at the same level. In addition to serious incidents as noted previously, an increase of reporting first aid and near hit (miss) incidents is required to improve our understanding of what the true health and safety risks are.

While on paper this would appear to be a worsening of performance (more incidents = more things going wrong) the opposite is actually the case.

Lost time injuries for the quarter are indicated below and we will introduce additional measures to the Three Waters Quarterly Report in future issues.

Lost time injury rate

	YTD	Rate	Trend
Wellington Water	0	0.0	↑
Contractors	3	16.4	↑
Consultants	0	0.0	-
Total	3	7.6	↑

Lost time injuries per million hours worked is an industry standard metric. The Health and Safety Forum expects this number to rise in the short term, as reporting increases.

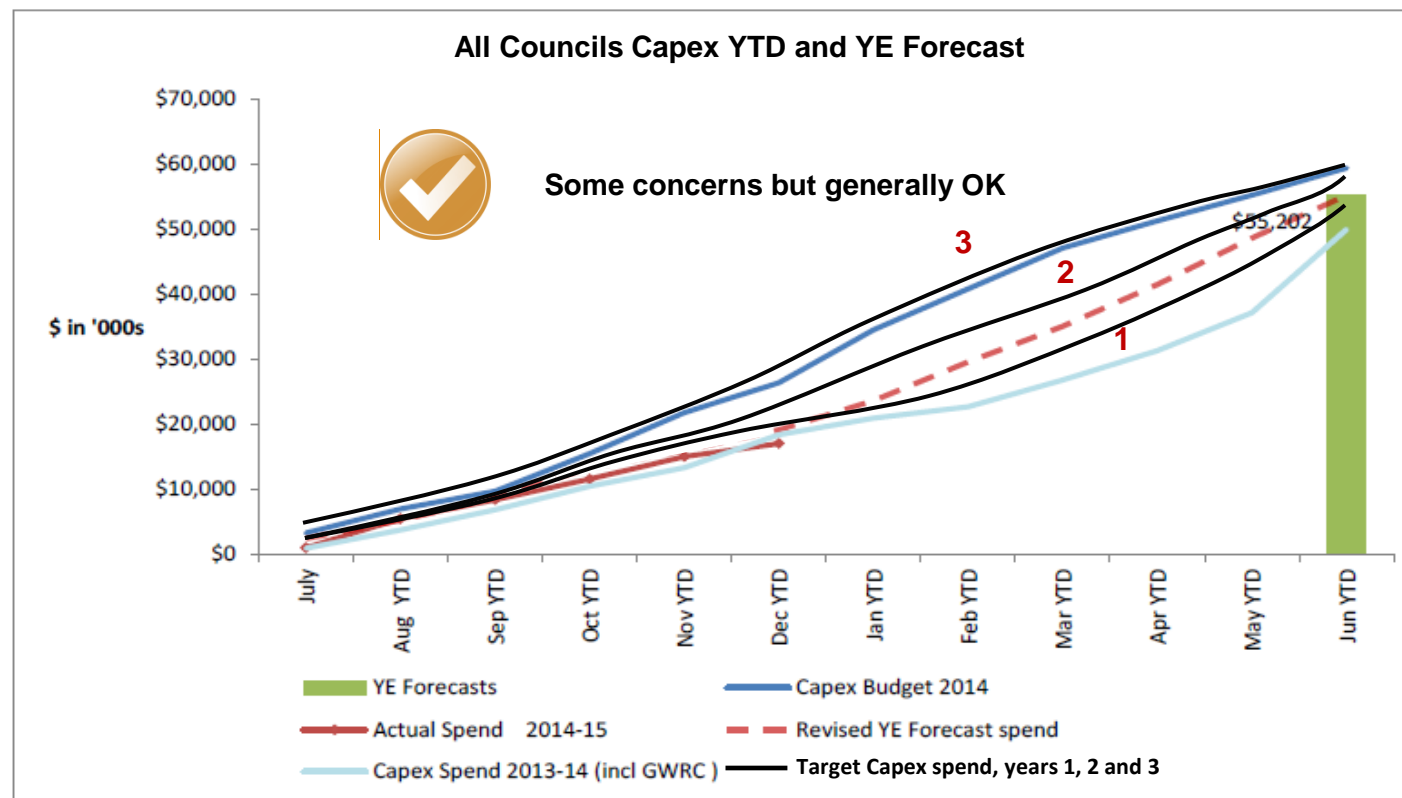
Programme delivery behind target but recovery expected

The 2014-15 capital works programmes for bulk and retail water, stormwater and wastewater are broadly on track, although showing under-expenditure for the first half of the year.

Of the total of 296 projects we're managing for client councils, 57 have been completed. We are closely watching some 37 projects to confirm whether they'll go ahead this year. The remaining 202 are on track.

Many of the forward design and investigation projects will not be completed until May and June 2015, resulting in the lower expenditure for the first six months of the year that the graph shows (right, light blue line). The three black numbered lines represent where we intend to be over the coming three years

The table (below right) shows operating (Opex) and capital (Capex) spending against budget for the period ending 31 December 2014. Opex spending for the year to date is tracking marginally below budgets. This is forecast to even out by year-end. While behind schedule for the cities three waters programme, we remain on track to deliver what was agreed with councils. \$27.5 million of the programme has either been completed or awarded. Of the remaining \$13.2 million all but \$3.5 million will be awarded by early March.



\$ in 000s	YTD actual	YTD budget	YTD variance	% variance	Annual Budget	YE forecast	YE variance
Opex	48,778	49,838	1,061	2.1%	99,720	100,320	-600
Capex	14,193	20,304	6,111	30.1%	52,135	47,475	4,659
Total	62,971	70,143	7,172	10.2%	151,855	147,795	4,059