

SURVIVING THE TASMAN TEMPEST – KEY CUSTOMER ENGAGEMENT IN THE FACE OF AUCKLAND’S WATER CRISIS

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ABSTRACT

In early March 2017, Auckland experienced the full force of major storm events that wreaked havoc on Auckland’s water supply catchments, particularly the Hunua Ranges. The Hunua Ranges supply the majority of Auckland’s water. The “Tasman Tempest” dropped more than twice as much rainfall in the Hunua Ranges than experienced in the last major Cyclone event in 1988. This unprecedented storm event resulted in major landslips, particularly in those catchments with commercial forestry. This led to a significant deterioration of water quality in the Hunua water supply reservoirs. With turbidity levels at an all-time high, the Ardmore Water Treatment Plant, which supplies two thirds of Auckland’s water, was pushed beyond the limits of its designed processing capabilities.

With water production significantly impaired and major uncertainty about the quantity of this vital water supply that could be produced, Watercare issued an urgent call to action. This action was for all Aucklanders to reduce water usage. A key area of focus was Watercare’s major commercial customers.

Of Watercare’s 25,000 non-domestic customers, our key account customers (the Top 80) account for approximately 40 percent of total non-domestic water usage. To meet Watercare’s water usage target of 400 million litres per day (down from the normal seasonal demand of nearer to 450 million litres), industry had to be called on to do its part. Watercare’s key account customers include Auckland Airport, major manufacturing facilities in Auckland, and major institutions such as Auckland Council, the District Health Boards, Department of Corrections, and universities.

This paper discusses Watercare’s engagement with key account commercial customers throughout the water crisis. While the response was overwhelmingly positive, it also had its challenges. Key customers were faced with the serious prospect of water restrictions and consequently the need to revisit their Business Continuity Plans.

There are many key learnings that can be shared from this experience, for example, the importance of knowing your customers—who they are, what they produce and what their water supply requirements are in terms of both water quality and quantity. It also highlighted the importance of having good communication channels and messaging to keep the water conservation message going over a sustained period of time.

KEYWORDS

Water crisis, water savings, key account customers, non-domestic customers

PRESENTER PROFILE

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1 INTRODUCTION

In early March 2017, several extreme weather events converged resulting in unprecedented rainfall in Auckland, particularly in the Hunua Ranges. Four of Auckland's water supply reservoirs, supplying two-thirds of Auckland's water, are located in the Hunua Ranges Water Supply Catchment Area. Over a period of 24 hours, the water quality deteriorated to the point that it affected the operation of the Ardmore Water Treatment Plant. The Plant could not sustain normal production levels.

With summer water demand levels at seasonal highs, Watercare would not be able to meet customer demand even with increasing production at other sources in the Waitakere Ranges and the Waikato River. It was time to call on all Aucklanders for help—everybody reducing their water demand a little would add up to a significant reduction in water demand. The "Save 20" campaign was launched, asking everybody to use 20 litres of water less per day.

Watercare also called on our non-domestic customers to help, particularly our largest commercial and institutional customers. Of Watercare's 25,000 non-domestic customers, our top 80 customers account for approximately 40 percent of the total non-domestic water usage. We sent out the call to action to these customers. The response was overwhelmingly positive, and they contributed to reducing water demand. Most of these customers depend on public water supply for production or to provide their services so they were concerned about what it would mean for their business. This paper looks at Watercare's engagement with key customers through the water event, the challenges this presented, the response, and the lessons learned about working with key customers during major water events.

2 THE TASMAN TEMPEST

On the night of Tuesday 7 March 2017, rain fell heavily across Auckland. By virtue of weather patterns, it fell particularly hard across the Hunua Ranges with over two months' of rain falling in one night. This unprecedented rainfall event led to hundreds of landslips in the Hunua Forest, resulting in huge amounts of silt and clay being deposited into all four water reservoirs. Overnight water quality deteriorated 100-fold, and the quality of water entering the Ardmore Water Treatment Plant was deteriorating rapidly. The rapid and extreme nature of this change resulted in the Ardmore Plant being shut down on Wednesday 8 March and again on Thursday 9 March.

At this point, Watercare initiated our Incident Management Plan and the Incident Management Team assumed control of the event.

Photograph 1: Hunua Dam After the Storm



2.1 COPING WITH THE STORM

Auckland's metropolitan water system is an integrated system supplied by four major sources. These sources, and the associated water treatment plants, are:

- the Hunua Ranges (four reservoirs)—Ardmore Water Treatment Plant
- the Waitakere Ranges (five reservoirs)—Huia and Waitakere Water Treatment Plants
- the Waikato River—Waikato Water Treatment Plant, and
- the Onehunga aquifer—Onehunga Water Treatment Plant.

Together the sustainable production capacity of these plants is 607 million litres per day.

Auckland's average water production across the year is about 405 million litres per day. During the first seven days of March 2017, Auckland's water demand required production levels of between 450 and 460 million litres per day.

The Ardmore Water Treatment Plant, which treats about two-thirds of Auckland's water, is a 60-year old facility. It was originally built to treat relatively pristine water stored in the Hunua Ranges. Overtime, the plant has been progressively and proactively upgraded, largely driven by changes in drinking water standards. These upgrades proved to be invaluable during this event given the high levels of process automation and redundancy implemented at Ardmore.

Rapidly increasing levels of silt and clay entering the Ardmore Plant pushed the installed processes beyond the processing capabilities. The Watercare operations team had to shut the plant down twice to ensure compliance with the New Zealand Drinking Water Standards. The Ardmore plant simply wasn't designed to remove these levels of solids from the source water. This raised very real questions about whether we be able to meet demand if Ardmore was taken out of production.

Fortunately, the team was able to stabilize Ardmore, albeit at reduced production rates. Because of the poor water quality, the plant simply could not treat as much water, and

the team had to slowly bring production levels up over time. Meanwhile, the transmission team was working hard to keep the treated water supply reservoirs across Auckland full to provide for demand. While production was increased at other plants to make up the shortfall at Ardmore, this wasn't a sustainable solution. Water treatment plants have a maximum capacity, but they cannot sustain this for long periods of time. In addition, water quality in the Waikato River had also deteriorated to unprecedented levels, with very high levels of organics and other contaminants put a huge strain on the Waikato Treatment Plant. To add to the complexity of this event, the Waitakere Treatment Plant also shut down due to changes in the quality of the source water.

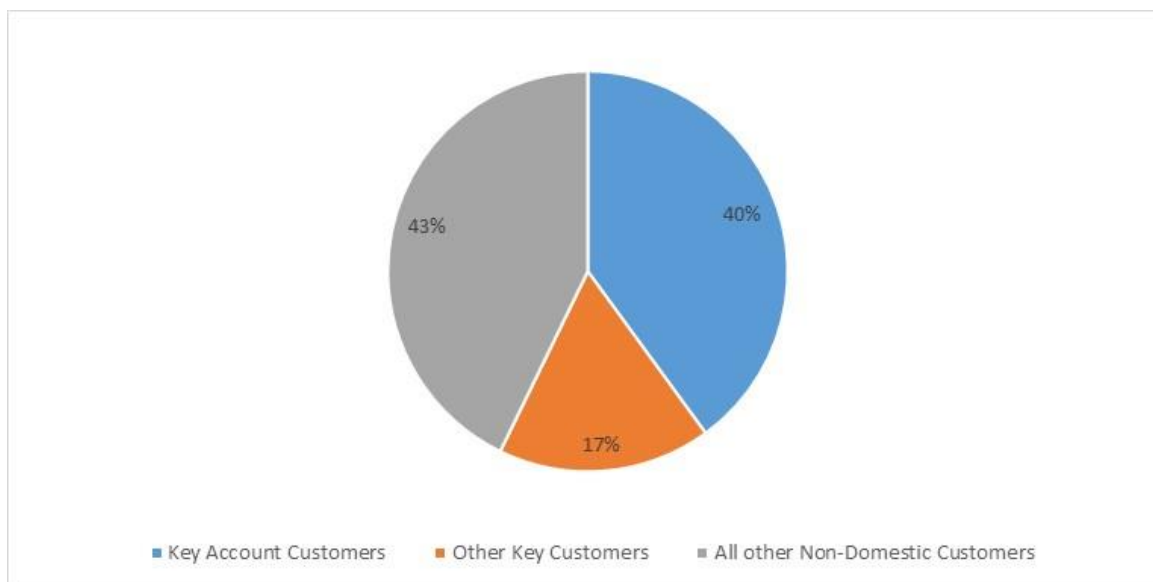
Urgent action was needed. This was an event that could not be managed on the supply side alone.

2.2 THE SAVE 20 CAMPAIGN

On Friday 10 March, Watercare launched the "Save 20" campaign asking all Aucklanders to help reduce demand by using 20 litres less of water every day. This was broadcast out through a number of channels—newspaper, radio, and social media. Through the campaign, Watercare called on the public to make voluntary savings. It wasn't an easy message to get across. The public understands the need to conserve water in times of drought. But in this event, there was water everywhere so why did they need to conserve water? The media played an important role in helping to show the pictures of the brown water in the reservoirs and the landslips that contributed to the problem.

In addition to calling on the general public, we also called on our commercial and institutional customers to help, particularly our largest water users. Watercare has approximately 25,000 commercial (or non-domestic) customers who collectively use approximately 25 percent of the water supplied by Watercare to our direct customers.¹ Of these customers, the top 80—our key account customers—account for 40 percent of non-domestic water use.

Figure 1: Key Account Customer Water Usage



¹ This excludes non-domestic customers serviced directly by Veolia Water. Veolia operates under a franchise agreement with Watercare and provides water and wastewater services to all customers in the former Papakura District Council area. Watercare provides bulk water supply to Veolia for distribution to its customers.

2.3 WATERCARE'S KEY CUSTOMER PROGRAMME

At Watercare, we have established a key account programme to manage our relationship with our major customers. Early this year, we started a project to revamp our key customer programme and put some structure around it. We started with a key customer list of approximately 300 customers. We have now broken this down into three groups:

- Key account customers (80 customers)—the largest water users by site, customers with significant numbers of sites (e.g., supermarkets), and strategic customers
- Major account customers (118 customers)—large water users, and
- Transactional account customers (143 customers)—those that have had engagement as a key customer but need to be revisited.

The purpose of this programme is to foster an enhanced relationship with major water users and those that have strategic importance due to the type or needs of the non-domestic customer. Through the programme, we are working to better know our customers and their needs, and for them to have a defined relationship with us so they know how to engage with Watercare when they have questions or issues that may arise with their supply or commercial arrangements.

We are very much in the process of reviewing and refining the customer lists. It will always be an evolving process as commercial customers make commercial decisions to grow, or in some cases make significant changes to their business or even shut down entirely. One of the key challenges to any key account programme is to keep it dynamic and responsive to customer requirements.

2.3.1 WHO ARE OUR KEY ACCOUNT CUSTOMERS

The key account customers can be broken down into four general groups:

- Food and beverage manufacturing companies—these are generally single site manufacturers or food or beverage products
- Other manufacturing companies—these are also typically single site companies that make intermediary or final products
- Institutional customers—this includes a range of customers that provide services to the community:
 - Auckland Council—Auckland Council is one of the largest water users with over 3000 domestic and non-domestic accounts. The majority of non-domestic water use is for sport and recreational facilities and parks
 - Auckland Airport—Auckland Airport operates its own network to service not only the Auckland International Airport and associated aeronautical precincts, but also its customers within the surrounding business park
 - District Health Boards—the major hospitals
 - Universities and Schools—this includes the University of Auckland and several of the larger private schools
 - Corrections facilities—the prisons, and

- Other non-manufacturing customers—large laundromats, large retirement villages, large retail, and large hotels.

2.4 ENGAGING KEY CUSTOMER DURING THE TASMAN TEMPEST

On Thursday 9 March, the call came to make contact with key account customers and ask for voluntary reductions in water usage. Initially, there was concern that if we didn't get the savings we needed, Watercare might have to release water that didn't meet the New Zealand Drinking Water Standards.

This situation is important to explain because it was critical to our engagement with key account customers. Initially, there were serious concerns about whether Ardmore would be able to continue in operation, and then even when it started to stabilize, concerns remained about whether we could meet total demand. The initial message that went out was that if we couldn't meet demand, there was a risk that water may not fully comply with the New Zealand Drinking Water Standards.

2.4.1 MAKING CONTACT

Following the call late on Thursday afternoon, we worked to put together an email distribution list to send out the message to all our key account customers to let them know about the water event and ask them to look at ways to reduce water usage. The email went out in the early evening only to be met by a quick fire return volley of "message undeliverable" bounced emails. The next day, we pulled together the wider team, divided up the list, and started to make calls to all the key customers to verify point of contact phone numbers and emails. By the end of the day, we had a solid list of contact information.

With the updated information we were able to send out regular updates to our key customer list, initially on a daily basis but reducing to every other day and then with less frequency as the situation stabilized and confidence increased that we had weathered the storm.

2.4.2 CUSTOMER QUESTIONS

With communication comes questions, and not all were easy to answer. The first question was how long would water savings be required? We asked them to plan to put measures in place until the end of March, a good three weeks away.

A second question that was raised by some was what would it mean for their business if the water did not meet Drinking Water Standards? Watercare proactively manages water quality to ensure that the water we supply to our customers is safe to drink. With the protections in place in the Hunua Ranges water supply management catchments, the raw water from the Hunua reservoirs is typically very clean and we rarely detect the presence of pathogenic microorganisms. To ensure our water is safe to drink, we comply with the New Zealand Drinking Water Standards. The Standards define what the processes need to achieve in order to remove pathogenic microorganisms.

However, the extreme nature of this event compromised the coagulation and filtration processes at Ardmore. This meant that the barriers to some pathogenic microorganisms were approaching the limits of compliance. To ensure that we did not compromise drinking water quality, Ardmore was shut down. When Ardmore was shut down for a second time, we continued to supply water from our treated water storage reservoirs. However, with water storage levels dropping, we reached a critical decision point. If we could not restore the production of safe drinking water from Ardmore, would we limit supplies or release water that did not fully comply with the Drinking Water Standards.

Because every business is different, with different production processes and equipment, this was not a question that we could answer for them. They needed to review their Business Continuity Plans (BCPs) and look at what they would need to do if there were interruptions in supply or water quality issues. The most significant concerns were, unsurprisingly, raised by the food and beverage industry customers who require water in their product or require water for cleaning the bottles or containers for the product. The answer depended on their own production processes and equipment, their quality standards, and whether they had their own water treatment processes in their production lines.

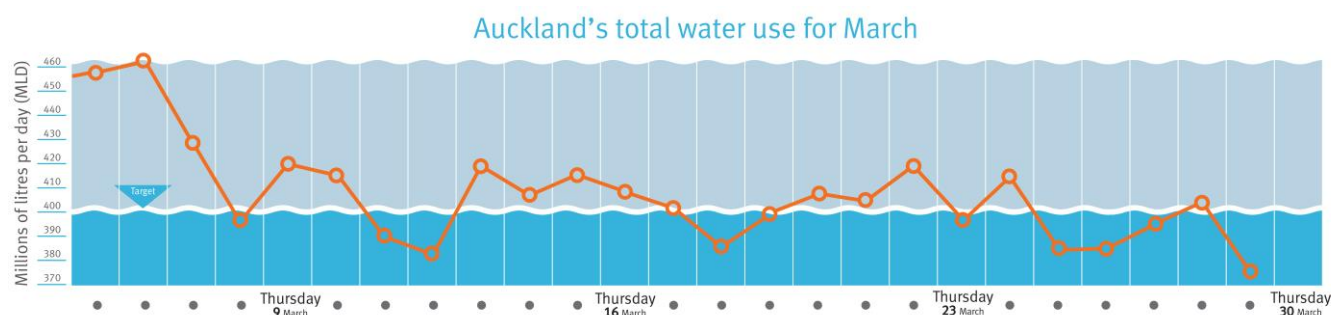
During the event, we had a lot of conversations with customers and certainly some interesting issues emerged. We worked closely with Auckland Council and early on asked them to limit irrigation. Given the amount of rain there had been, this wasn't a difficult request, but as time went on and the sun came out, the sports and recreation team needed to water the newly planted sports fields or risk major final loss. Likewise, with the World Master's Games looming, a major planting initiative was in jeopardy. A university in Auckland was very proactive in shutting down all irrigation systems, but then wasn't very happy when a member of the public called them out for having a sprinkler left on that was missed out from their initiative. One of the customers that checked in most frequently was the prison because they had very strict contingency provisions for dealing with prisoners that would have been triggered by non-potable water being discharged into the network.

2.4.3 WATER SAVINGS

Watercare's target was to reduce total water demand to 400 million litres per day. In the days prior to the storm, demand was hovering around the 450 million litres per day. With Ardmore stabilized at an output of 175 million litres per day (down from its normal production of 330 million litres per day), total sustainable production was 400 million litres per day.

The graph in Figure 1 shows that demand dropped significantly in the days of the storms. Following the storm, demand fluctuated over the course of the weeks, hovering above the 400 million litre per day target during the work week and dropping below on the weekends. But overall, demand maintained a rolling average around the 400 million litres per day mark which enabled Watercare to meet demand until the end of March when the 'Save 20' campaign could be brought to a close. While significant rainfall played a part in reducing demand for irrigation and other outdoor use, this clearly showed that Aucklanders responded to the call to action.

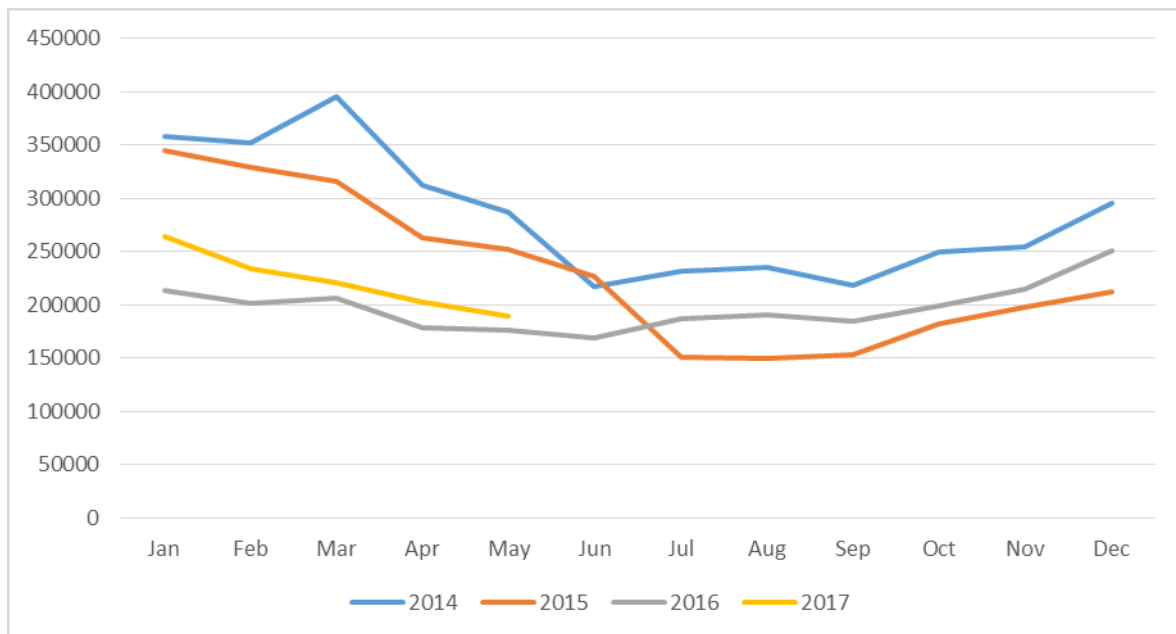
Figure 2: Auckland's Water Use In March 2017



What part did our key account customers play in reducing demands? Watercare reads larger non domestic customer meters once a month, with different customers read on

different days depending on the meter reading route. With only monthly data available, the aggregated data doesn't tell us a lot. Figure 3 shows water usage for selected key customer accounts. The data shows that demand decreased in March 2017, but as illustrated by data from the three previous years, this follows normal trends for water usage during this period.

Figure 3: Water Demand for Selected Key Customer Accounts



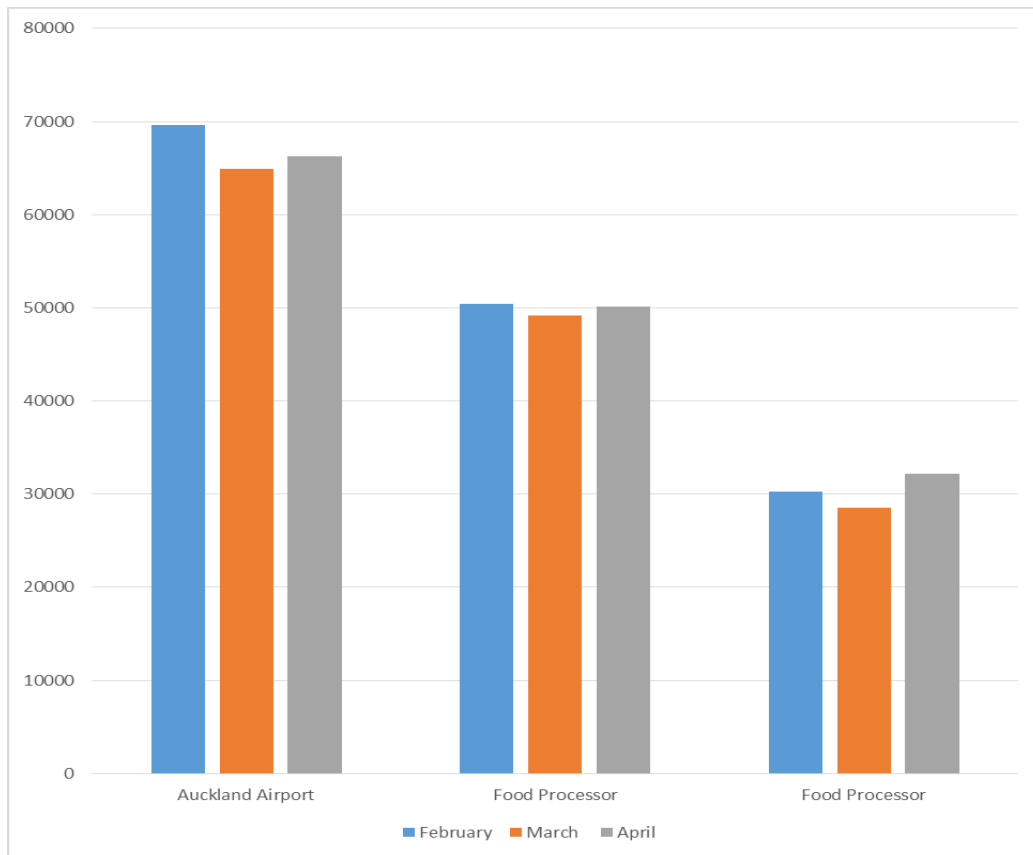
Customer feedback and anecdotal evidence does suggest that these customers did what they could to reduce their water usage. A notable example is Auckland Airport which includes not only the Auckland International Airport but also the surrounding business park. Auckland Airport reduced or deferred activities under their control such as their engineering vehicle wash bay and building sprinkler testing and worked with airlines, retail and commercial businesses to encourage overall water savings.

Other examples are:

- Z Energy service stations shut down their car washes
- Auckland Council shut off irrigation systems and water features
- Allied Concrete used stormwater for their process water, and
- A large beverage manufacture brought forward a planned maintenance shut down and deferred water blasting their facility roof.

Drilling down into selected customers, the data does suggest that there were reductions in water usage during the March event as shown in Figure 4. Auckland Airport's usage dropped 5000 million litres from February. The other two examples are food processing businesses. One shows some savings during March with usage returning back to pre-event levels. The other also shows some reduction with an increase in usage in the following month. This is not surprising. Customers in Auckland are charged for their water usage on a volumetric basis so they have had incentives in place to manage their water use. Also, major water savings are a result of changes in production technologies or processes that take time and investment to achieve. Therefore, quick win savings are based on checking for leaks, making minor adjustments, and deferring some activities.

Figure 4: Examples of Key Customer Savings



The amount of water savings was also reflected in the feedback from the customer survey following the event. Of the customers that responded to the survey, 26 percent said that they achieved significant savings, 49 percent small savings, 9 percent no savings, and the rest reported that they didn't know.

2.4.4 WATER CONTINGENCY PLANNING

In the very early stages of the event, there were concerns about the ability of the water treatment plants, particularly Ardmore, to fully treat enough water. However, with Ardmore stabilized within a few days, the scenario changed from whether the plants would be able to fully treat water to whether they could supply enough water to meet demand. This led to an internal contingency planning exercise to review the steps that could be taken quickly to implement further water savings if voluntary savings were not enough to keep demand in line with production capacity. This was based on an action plan that stepped through a suite of measures for a range of sectors such as residential, Council, construction, and non-domestic customers to avoid the worst case scenario.

Table 1: Water Conservation Contingency Plan

Water Conservation Level	Action	Focus
Level 1	Voluntary Reductions	Across all sectors
Level 2	Mandatory Restrictions on Non Consumptive and Non Productive Uses	Focus on activities such as irrigation and outdoor use, wash-down and other uses that

		had minimal economic impact
Level 3	Voluntary Rolling Shut-downs	Focus on targeted shut-downs or reductions in productive activity to maintain demand within cap.
Level 4	Mandatory Shut-downs	Focus on requiring mandatory shut-downs
Level 5	Release of water that did not fully meet Drinking Water Standards	Unlimited water supply but may not meet Drinking Water Standards

A key target of this plan was our big water users and the potential for going beyond asking for voluntary savings to more drastic measures such as partial shut-downs that would have significant economic impact on business. Fortunately, it didn't come to that. But, this has added a new focus to our key account customer programme to understand the water usage requirements and patterns of these customers to be able to more effectively engage with them on targeted actions should this be required.

3 LESSONS LEARNED

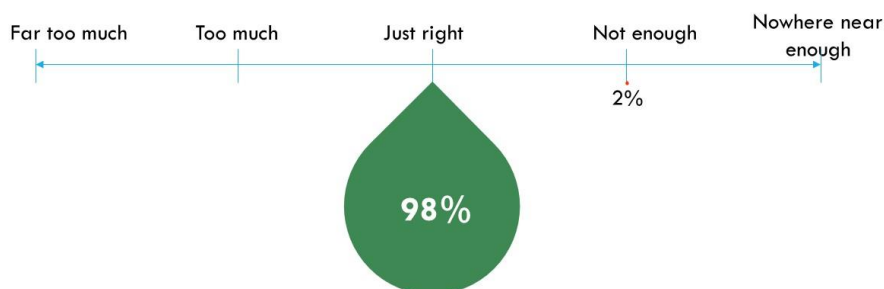
On 3 April, Watercare declared the incident closed and called the Save 20 campaign to an end. Looking back, there are important lessons from the customer feedback and the process we went through.

3.1 CUSTOMER FEEDBACK

In the days following the end of the campaign, we sent out a short survey to our key customer list to ask for their feedback on our communication with them. The survey was sent out to 167 customers, with response rate of 28 percent. This is a pretty good return rates for surveys.

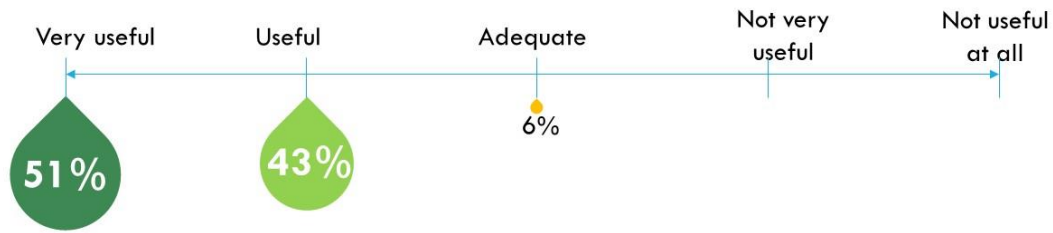
The first question was about the frequency of communication (Figure 5). Of those that replied, 98 percent agreed that the frequency of communication was just right, although a few commented that they would have preferred communication earlier in the day to help them plan.

Figure 5: Frequency of Communication



We also asked if the information was useful. Overall 94 percent responded that the information was useful or very useful (Figure 6). The same group confirmed that the communications provided all or mostly all of the information they required.

Figure 6: Usefulness of Communication



Additional information that customers said they would have liked to have had includes:

- How this level of usage compared to other years
- A comparison of consumption between domestic and non-domestic users, and
- Information on how much treated water supply remained.

3.2 LESSONS

Overall, this event highlighted the importance of our key account customer programme and the relationships we have with these customers. The wider community, including these customers, rely on water supply as an essential service, but these customers also rely on the public water supply for their production processes.

There four main lessons learned include the importance of:

- Knowing your customers
- Building strong relationships with key customers
- Understanding what customer requirements are, and
- Bringing the customers' perspective into managing a crisis.

Know Your Customers

The key lesson that this event reinforced was the importance of knowing our key customers. As we found out early in the campaign, it is vital to have up-to-date contact information about your customers. While we have a lot of information in our systems, we found some was out of date or the point of contact information we had was for the administrative people and not the operational side of the business that we needed to contact in the event of an emergency.

Another key point was knowing about customers' water requirements and how they used water on-site. For example, does the plant operate 24/7 or just during the week? Do they have alternative water sources on site, such as a bore or water recycling capability? Is their water usage directly linked to their production volume or is there a baseline requirement for health and safety? Is the quality of water they receive critical to their process? Do they have water treatment facilities on site? The answers to these questions can help us understand the potential for water savings, and how they will be affected by such events.

Strong Relationships with Customers

Overall customers generally wanted to help. In particular, those customers that have strong relationships with us were keen to work with us to not only understand the situation but help us and in turn work with their teams and customers to spread the water savings message. In addition to looking for opportunities to save water within the business, they also put up posters in their staff rooms and around their facilities to encourage their staff to take the savings home and do their part to 'save 20'. The crisis also reinforced the value of strong relationships to be able to call on these customers for support, based on a shared understanding of their requirements.

Understand what Customers Require

Part of knowing your customers is also clearly understanding what they need from us in a water event. As discussed above, it is important to know the key drivers. For example, how critical is water quality and what are the implications when there is break in supply. Other information that is important is:

- How much notice they require to respond to an event?—All customers would like as much notice as possible. In emergency events, it is not always possible to give notice, but there may be critical pathways for production processes that even a few hours' notice can make a difference.
- Do they have a business continuity plan?—The plan should outline what steps they will take in the case of water outages or water quality issues.

From the survey results, we found that this event led 42 percent of the customers who responded to the survey to review their business continuity plans, and another 26 percent indicated that they plan to review it. Sixteen percent already had a robust plan in place, but another 16 percent said that it wasn't a priority for them.

While shown in the survey results our communications were understood by our key customers, there were some customers, mainly those that would have been severely affected by a boiled water notice that needed more from us in order to prepare. This was difficult at the time but is something we need to work towards for any future events.

Bringing the Customer Perspective into Managing an Event

Finally, a key lesson from this event—one that is relevant to all planned and unplanned events—is the importance of thinking about the impact from the customers perspective and making sure that this is brought into the discussions during event management process. Often events are dealt with from an operational perspective and all the work is focused on solving the technical issues. It is important that the people within the water utility that are responsible for customer relations and communication are brought in early on in the process so they can bring the customer requirements into how the event is managed.

4 CONCLUSION

The rainfall events in early March triggered a water crisis on scale that Watercare had not had to deal with since the last major drought in 1994, and was the first event since the integration of Auckland's water wholesale and retail functions in November 2010. The event brought together our internal teams to work as 'one team' to manage the event. By working together, we were able to weather the crisis, and, with the support of Auckland, continue to provide uninterrupted water supply.