COMMERCIAL IN CONFIDENCE

FINAL REPORT

Customer willingness to pay

Customer-informed IPART submission (CIPA) Phase 2

Prepared for
Sydney Water

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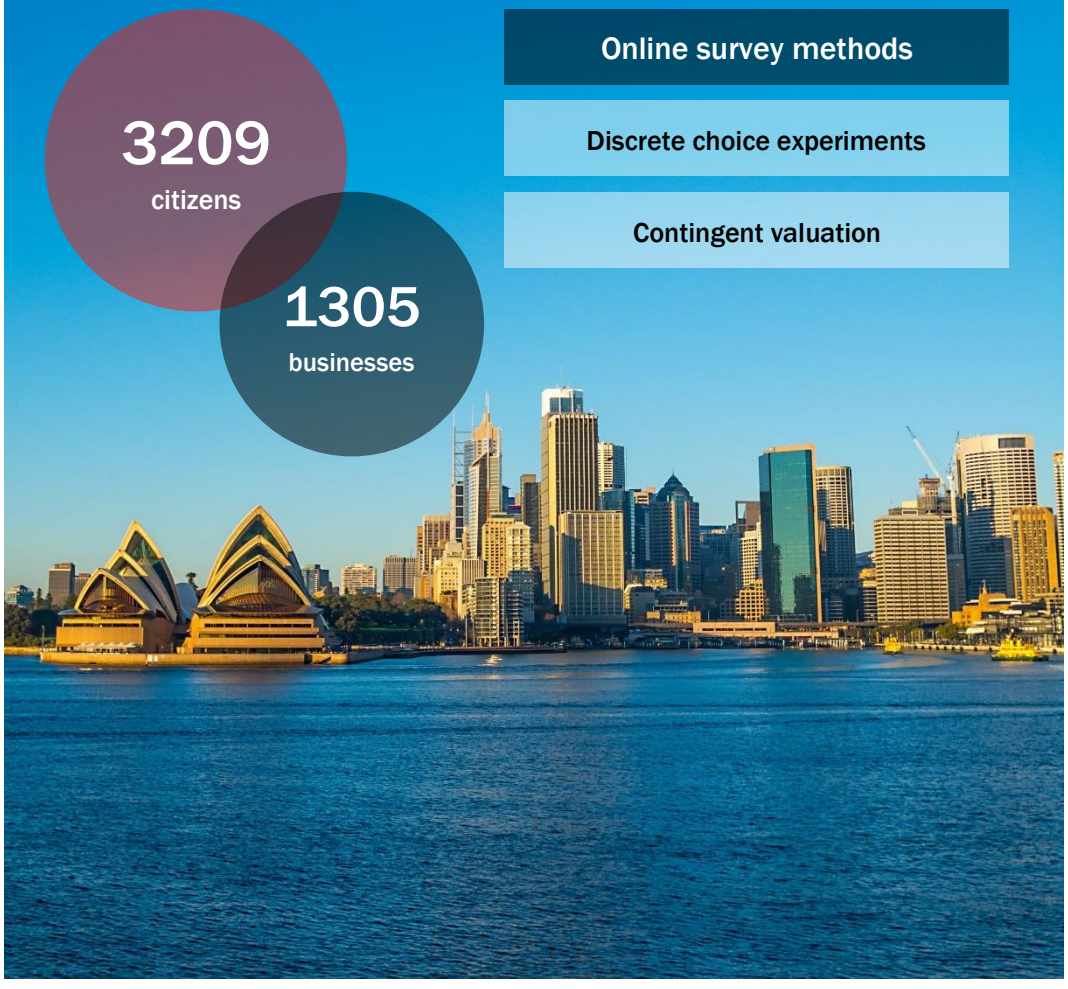
Summary

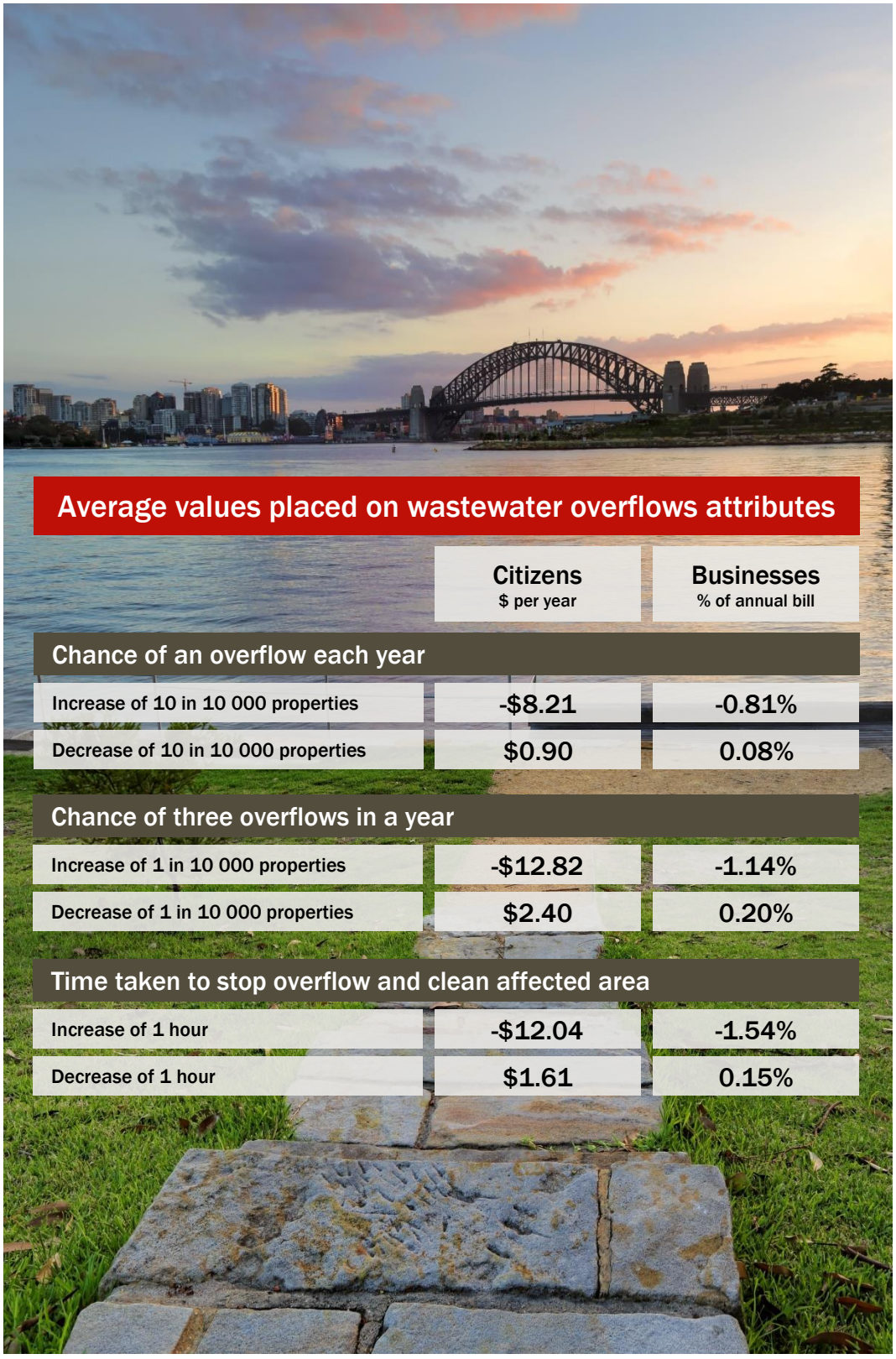
Sydney Water customers told us

- Avoiding wastewater overflows is more important than avoiding water interruptions.
- Limiting the length of interruptions is important. Long planned interruptions are worse than short unplanned interruptions.
- Avoiding repeat wastewater overflows is very important.
- The bill reductions customers expect for service degradation are much larger than the amounts they would be willing to pay for service improvement.
- Most customers are willing to pay some amount towards digital meters, limiting the release of raw wastewater at Sydney cliff faces and addressing chronic low water pressure.
- Most customers would use the features enabled by digital meters, with leak alerts the most likely and check-in alerts the least likely to be utilised.
- Improved water conservation is seen as an important benefit from digital meters, while cost is the main barrier to support.



Average values placed on water interruptions attributes

	Citizens $ per year	Businesses % of annual bill
Chance of an unplanned interruption lasting 1-3 hours		
Increase of 10 in 1000 properties	-$1.22	-0.17%
Decrease of 10 in 1000 properties	$0.56	0.09%
Chance of an unplanned interruption lasting 6-8 hours		
Increase of 10 in 1000 properties	-$4.96	-0.34%
Decrease of 10 in 1000 properties	$2.27	0.17%
Chance of three unplanned interruptions in a year		
Increase of 1 in 1000 properties	-$0.86	-0.08%
Decrease of 1 in 1000 properties	$0.39	0.04%
Chance of a planned interruption lasting 4-6 hours		
Increase of 10 in 1000 properties	-$2.59	-0.31%
Decrease of 10 in 1000 properties	$1.19	0.16%



Average values placed on wastewater overflows attributes

	Citizens $ per year	Businesses % of annual bill
Chance of an overflow each year		
Increase of 10 in 10 000 properties	-$8.21	-0.81%
Decrease of 10 in 10 000 properties	$0.90	0.08%
Chance of three overflows in a year		
Increase of 1 in 10 000 properties	-$12.82	-1.14%
Decrease of 1 in 10 000 properties	$2.40	0.20%
Time taken to stop overflow and clean affected area		
Increase of 1 hour	-$12.04	-1.54%
Decrease of 1 hour	$1.61	0.15%


Average willingness to pay for other service offerings
Citizens
Businesses
Digital meters
Water usage information through website and notifications
$3
per quarter ongoing
1.1%
of each bill ongoing
Wastewater outfalls
Limiting the release of untreated wastewater at Sydney cliff faces
$18
one-off payment
9.6%
of one quarterly bill
Water pressure
Improving pressure for 130 customers who experience chronic low pressure
$5
one-off payment
1.3%
of one quarterly bill

Contents

BOXES, CHARTS AND TABLES

1 Introduction

Background

Sydney Water is committed to improving its overall customer value proposition by putting customers at the heart of everything it does. Sydney Water has promised:

> …to make every one of our customers proud by giving them a voice in what we do, and playing our role in creating liveable communities.
>
> This means we will involve customers in the big decisions that impact them…[1]

Many of the big decisions impacting the prices and service levels experienced by customers are made in the context of the operating licence and price reviews undertaken by the Independent Pricing and Regulatory Tribunal (IPART). Sydney Water wants to involve customers in developing the business plans and proposals that it submits to these reviews and in developing other business strategies.

Sydney Water planned three phases of customer engagement for 2018 to inform its submissions to IPART in relation to the operating licence to apply from 2019 and the price determination to apply from 2020. The first phase involved a series of deliberative forums, discussion groups, interviews and online surveys conducted during February and March 2018.

This report details the method and results from a subset of the second phase of customer engagement – a series of online surveys conducted in August and September 2018, designed to measure customer willingness to pay for changes in several aspects of the services provided by Sydney Water.

Objective

The primary objective of the research detailed in this report is to provide input to economic cost-benefit analyses of service options. In particular, the objective is to measure the economic benefits or costs resulting from:

- changes in the number and nature of water supply interruptions;
- changes in the number and nature of wastewater overflows;
- notification services and online information enabled by digital water meters;
- a reduction in the release of untreated wastewater into the ocean at cliff faces; and
- an improvement in water pressure to customers experiencing chronic low pressure.

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1 Sydney Water 2016, Sydney Water Customer Toolkit, December, p. 5.

Approach

The conventional measures of economic benefit or cost from an improvement or degradation in service levels are the Hicksian compensating and equivalent variations, which correspond to the maximum amount that customers would be willing to pay for an improvement or the minimum amount they would be willing to accept as compensation for a degradation (Randall and Stoll 1980).

Robust estimation of these values using real market data is not possible in this study. The natural monopoly nature of water and wastewater network services and the indivisibility of the network service mean that customers are generally unable to choose between alternative service levels that could be provided by Sydney Water. As a result, customer preferences are not revealed through market choices as they would be in a competitive market.

Instead we turn to stated preference techniques to measure customers' maximum willingness to pay (WTP) and minimum willingness to accept (WTA) for a range of different changes in service.

As an aside, when the term WTP is used in this report, it means the maximum WTP for a change in service. It is not used in relation to customers' satisfaction or attitude towards the level of their water bill.

There are two main stated preference techniques – contingent valuation (CV) and discrete choice experiments (DCE) – both of which are utilised in this research.

CV surveys involve presenting respondents with a specific policy or project proposal and asking whether they would vote for the proposal at a specified cost. The cost level is varied over respondents to allow the estimation of a demand curve and the expected value of WTP for the proposal. Applications of the CV technique to utility service levels include Carlsson and Martinsson (2007) and Layton and Moeltner (2005).

DCE surveys involve presenting respondents with several choice questions. Each choice question presents two or more hypothetical scenarios with specified cost and asks the respondent to indicate their preferred option. The scenarios are described by multiple attributes and the levels assigned to attributes vary over scenarios and over questions. This variation is designed to support statistical estimation of the value placed by respondents on changes in each attribute.

The application of this technique to utility service levels has been increasing over the past 15 years. Studies have been conducted in Australia in relation to electricity networks by Essential Services Commission of South Australia (KPMG 2003), Evoenergy (McNair et al 2011b, Hensher et al 2014) and the Australian Energy Market Operator (AEMO 2014) as well as water and wastewater services by Icon Water (Hensher et al 2005, McNair and Ward 2012, McNair and Scarpa 2016). Several studies have also been conducted in the United Kingdom; for example, by Yorkshire Water (Willis et al 2005), Southern Water (Accent 2013b), South East Water (Accent 2013a) and the UK Office of Gas and Energy Markets (Accent 2008).

We applied the DCE technique to the water interruptions and wastewater overflows topics, since they require estimation of the value placed on multiple service dimensions,

including the duration of the event and the likelihood of an individual customer experiencing multiple events within a 12-month period. We applied the CV technique to the other topics, since they require estimation of the value placed on a specific project or program.

1.1 Stated preference techniques by topic

Topic	Stated preference technique
Water supply interruptions	Discrete choice experiment
Wastewater overflows	Discrete choice experiment
Digital water meters	Contingent valuation
Untreated wastewater ocean outfalls	Contingent valuation
Chronic low water pressure	Contingent valuation

Source: CIE

A rigorous methodology was applied in this study, including:

- internal peer review by Professor Riccardo Scarpa, a leading expert in the field (see Appendix A);
- conducting fieldwork over multiple waves, with model estimation conducted and adjustments made to stated preference questions between each wave;
- adapting efficient experimental designs (the combinations of attribute levels across DCE alternatives) for each wave using data collected over previous waves; and
- estimating WTP using statistical models that account for:
  - differences in WTP for service improvement and WTA compensation for service degradation; and
  - variation in preferences across respondents for each service attribute and correlation in that variation across attributes.

2 The research topics

Water interruptions

Sometimes, Sydney Water needs to turn off the mains water supply to fix water pipes.

While the water supply is turned off, customers cannot get water from the taps on their property.

Sometimes, Sydney Water will give warning about a water interruption by sending a letter to affected customers at least 24 hours beforehand. On other occasions, the work will be urgent and Sydney Water will not be able to warn customers about an interruption.

Interruptions with warning typically happen after 9am in residential areas and after 11pm in business areas. Interruptions that occur without warning could happen at any time of day or night.

During a water interruption, customers could be affected by noise from trucks and workers on their street. Traffic could be blocked or slowed to allow these trucks and workers to fix the broken water pipes. Customers' travel time could be affected even when interruptions happen in areas away from their property.

Sydney Water reduces the risk of unexpected interruptions by doing things like:

- installing pressure-reducing valves in the water pipes; and
- replacing ageing pipes.

These activities come at a cost that needs to be recovered in Sydney Water bills paid by customers. This research seeks to understand customer preferences for balancing this cost with the risk of water supply interruptions.

Currently, the risk of lengthy and repeat unplanned interruptions is regulated by IPART via the water continuity standard in Sydney Water's operating licence:

4.2.2 Water Continuity Standard

a) Sydney Water must ensure that, in any financial year:

i) no more than 40,000 Properties experience an Unplanned Water Interruption that lasts for more than five continuous hours; and

ii) no more than 14,000 Properties experience three or more Unplanned Water Interruptions that each lasts for more than one hour (IPART 2015)

Wastewater overflows

Wastewater is the used water that goes down sinks, toilets and drains. When the wastewater system becomes blocked, for example due to tree roots, wastewater can overflow from the manholes that are used to access the sewerage pipes or from a grate on customer property.

In rare cases (about 1 in 200), wastewater may overflow within a building, for example from a shower drain.

Wastewater is mostly water, but it can contain viruses, bacteria and other organisms that are harmful to humans, animals and the environment. In the event of an overflow customers need to stop using toilets, sinks and other drains and keep away from the affected area until the blockage has been cleared and the area has been thoroughly cleaned by Sydney Water staff.

Wastewater overflows can happen at any time of day. It typically takes about five hours before Sydney Water has unblocked the pipe and cleaned the affected area.

As with water interruptions, customers may be affected by noise or traffic disruption due to trucks and workers conducting this work.

Sydney Water reduces the risk of these overflows by doing things like:

- putting cameras down pipes to monitor their condition;
- replacement of ageing pipes; and
- cleaning pipes.

These activities come at a cost that needs to be recovered in Sydney Water bills paid by you and other customers. This research seeks to understand customer preferences for balancing this cost with the risk of wastewater overflows.

Currently, the risk of lengthy and repeat unplanned interruptions is regulated by IPART via the wastewater overflow standard in Sydney Water's operating licence:

4.2.3 Wastewater Overflow Standard

a) Sydney Water must ensure that, in any financial year:

i) no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Wastewater Overflow in dry weather; and

ii) no more than 175 Properties (other than Public Properties) experience three or more Uncontrolled Wastewater Overflows in dry weather (IPART 2015)

Digital meters

Sydney Water is considering the merits of rolling out digital meters. Unlike existing traditional meters, which are read in person each quarter, digital meters can provide customers with more frequent information about water usage on their property; for example, hourly data, updated once a day.

Digital meters would be read automatically, meaning Sydney Water wouldn't need to enter customer properties.

As part of any program to install digital meters, customers would be able to choose whether to get the following notifications from Sydney Water (via SMS):

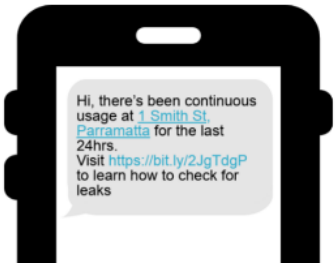
- Leak alerts
- High use notifications
- Bill predictions
- Check-in alerts.

Sydney Water could also provide an app or website portal where customers could log in to see more detailed information, such as:

- hourly usage data; and
- usage comparisons to customers with similar characteristics.

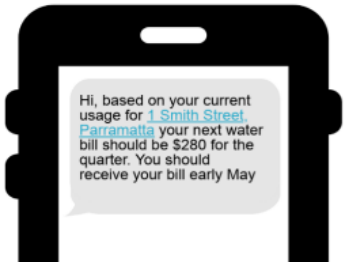
Leak alerts

Digital meters can detect continual water flow above a certain threshold, which may be due to a leak. Sydney Water could send an alert or notification if a customer has continual flow at their property over 24 hours. This could be useful for identifying a continually running toilet or a hidden leak, for example.



High use notifications

Sydney Water could send customers an alert or notification when their daily water use goes over an amount that they have specified. This could be useful for catching watering systems that have been left on, or hoses being used to top up swimming pools, before they cause large water bills.



Bill predictions

By understanding customers' average daily use, Sydney Water could send customers an estimate of their next water bill early in the billing cycle. This could help customers manage their finances by avoiding unexpected changes in quarterly bills.

Check-in alerts

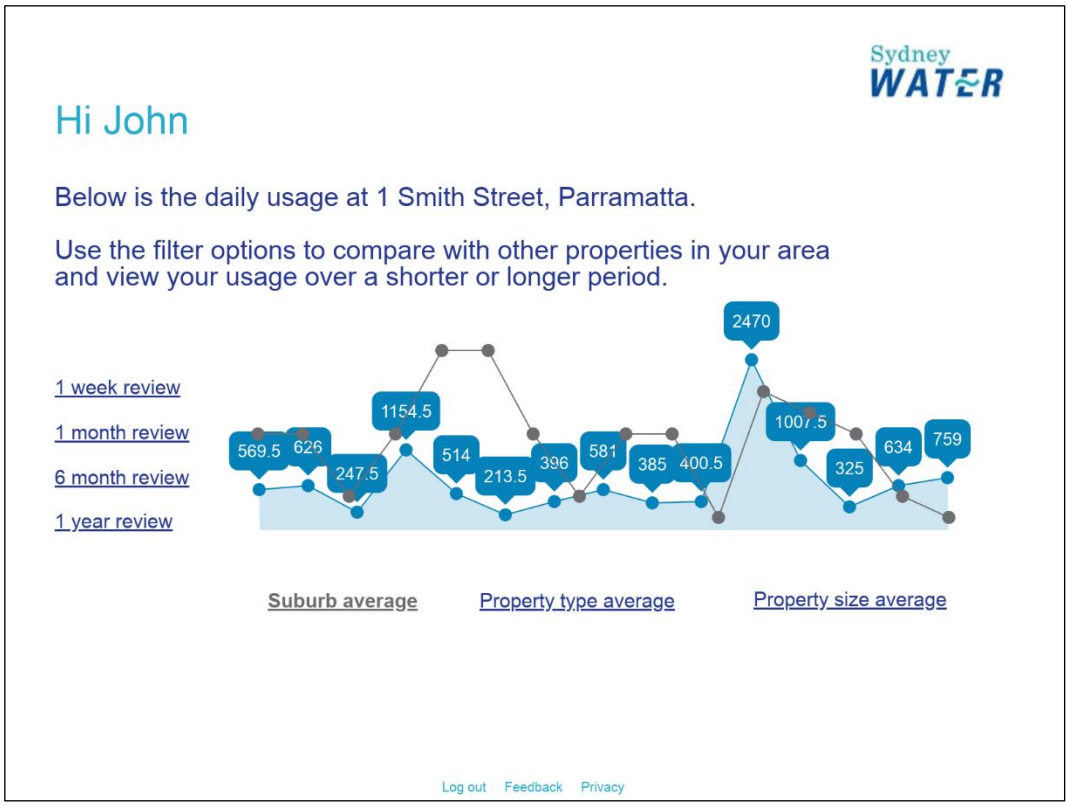
Sydney Water could allow customers to get check-in alerts about water usage at other properties that have provided permission. For example, customers could get an alert:

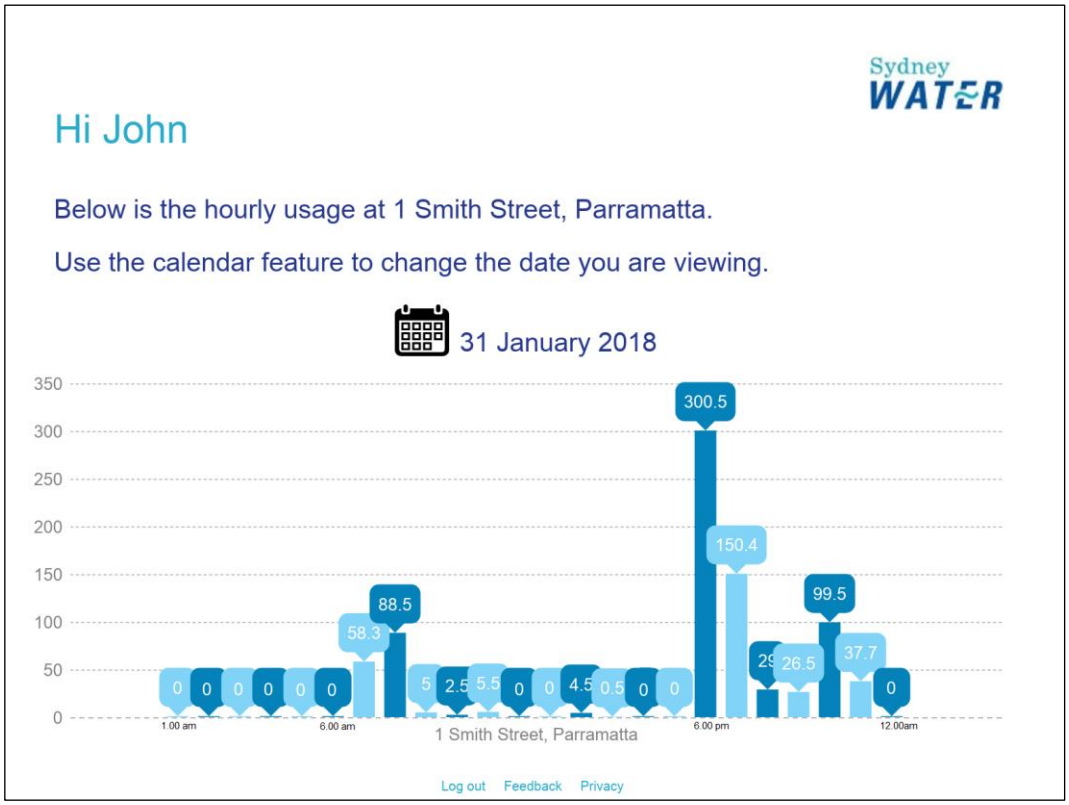
- when water is used at a vacant property or holiday house they manage; or
- when daily water use falls to zero at an elderly relative's property, which could alert customers to a health problem.

App and/or website portal

An app or web portal could show customers:

- how their daily water usage compares to other properties with similar features (customers may find this useful during times of drought when water conservation is even more important); and
- hourly water usage, which would allow customers to check the usage on their property in greater detail.





This information would not be pushed to customers automatically as for the earlier options. Customers would need to log in and look at the data themselves.

Digital meters may be more expensive than the water meters we have used in the past. While some of that cost would be paid for by not having to read meters in person and from finding leaking pipes more quickly, some of the cost may need to be paid for by increases in water bills. This research seeks to measure customer WTP for the installation of digital meters and the various notification and information services that would enable.

Wastewater ocean outfalls

Most of Sydney's wastewater is treated and released deep in the ocean, but there are three outfalls in Sydney, built between 1916 and 1936, that release raw (untreated) wastewater at the base of cliff faces under the sea. This is the only wastewater system in New South Wales that puts untreated wastewater into the ocean 365 days of the year.

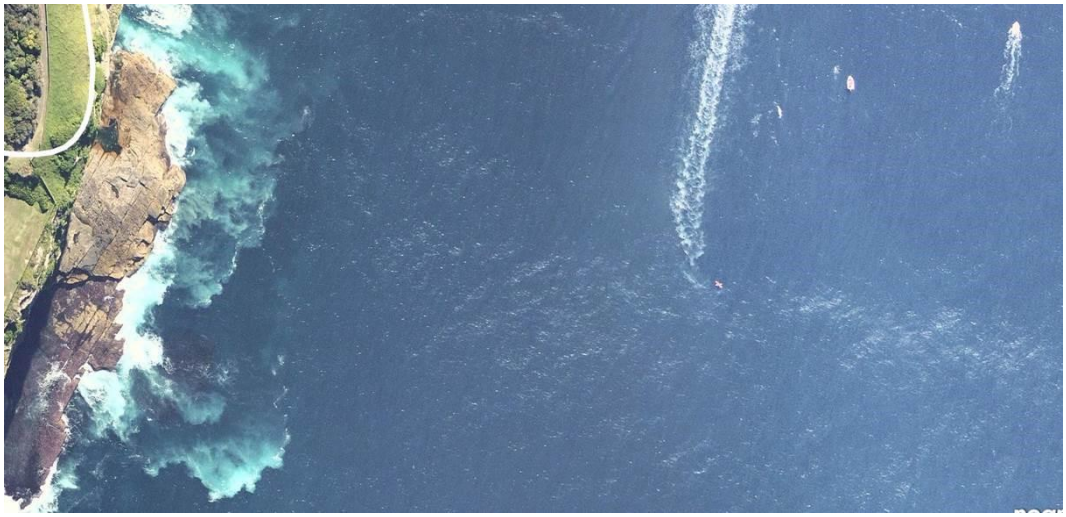
Every day, these three outfalls put four Olympic swimming pools' worth of raw wastewater into the ocean, along with 2-3 wheelie bins' worth of plastics and hygiene products. Despite this, water quality testing that occurs every six days at recreational areas near the outfalls continuously shows very good water quality. The pollutants are in a relatively small area of ocean at the bottom of cliff faces.

There are two main problems caused by the raw wastewater outfalls:

- public health risks; and
- ecosystem impacts.

In relation to public health risks close to the outfall sites, a Sydney Water pollution study found that:

- around 2000 people visit the affected areas each year for spear fishing, rock fishing and swimming; and
- around 300 people have direct contact with pollutants through organised swim and paddle events.



Ecosystem impacts close to the outfall sites, include:

- degraded ocean floor habitat, with barren areas and 'brown fuzz';
- increased growth of algae;
- more opportunistic species in the area;
- floating rubbish, which can harm sea creatures by swallowing or becoming tangled;
- a bad smell, including on cliff tops; and
- a visible 'plume' in the water 75 per cent of the time, including oil and grease on top of the water.

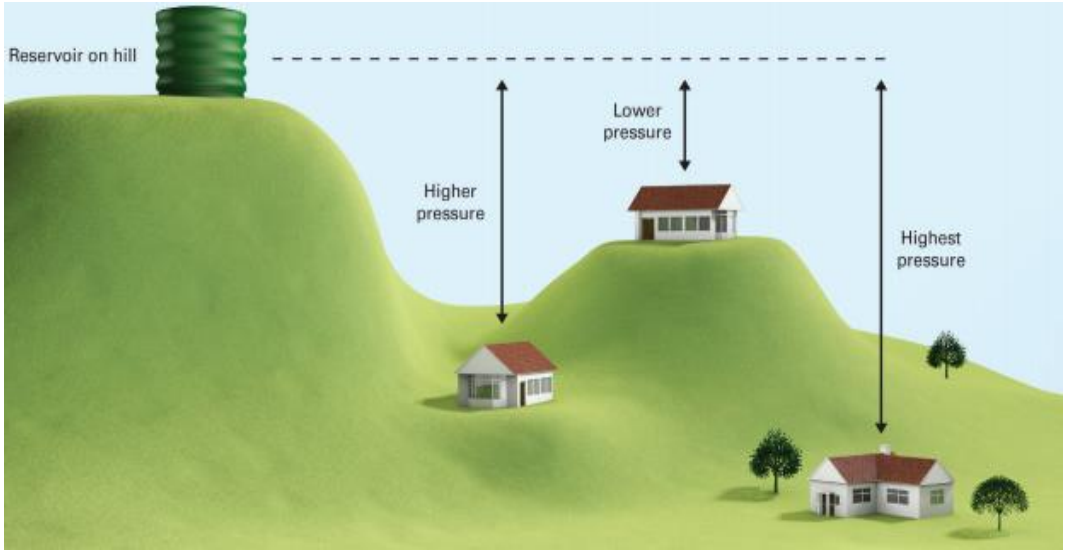
Sydney Water can reduce these public health and ecosystem impacts by investing in new infrastructure to divert the raw wastewater into another part of the network where it will be treated.

After this investment, no wastewater would be released from the three outfalls during dry weather. Wastewater flows are highest when it rains, because rain gets into the wastewater system through faulty private plumbing and cracks in pipes. The new infrastructure would not be able to divert all of this extra wastewater. As a result, some diluted raw wastewater would be released from the three outfalls when it rains.

This new infrastructure would come at a cost that needs to be recovered in Sydney Water bills paid by customers. This research seeks to measure customer WTP for the project and the resulting reduction in releases of raw wastewater into the ocean.

Water pressure

Water gets to customers through a network of water supply zones. Water reservoirs are located at high points in each water supply zone. Water gets from the reservoir across the zone using gravity. Water pressure varies at different locations in the zone depending on how far customers are from the reservoir and their elevation in relation to the reservoir.



Water pressure in Sydney Water's system can fall when people are using water or when a pipe breaks. In areas with lower pressure, this may result in slow flow of water from taps. Customers may notice:

- taking a few minutes to fill a bucket;
- only a trickle of water coming from second-floor taps/shower; or
- not being able to use water in more than one place in the home (e.g. not being able to shower while using the washing machine).

There are around 130 properties in Sydney that experience these low-water-pressure events on an almost daily basis. Sydney Water can improve water pressure to these 'worst-served' properties by investing in water pressure booster pumps. This investment comes at a cost that would need to be paid for by Sydney Water bills. This research seeks to measure customer WTP to bring the service level for these 130 properties up to the minimum level experienced by the rest of Sydney Water's customers.

3 The research method

Online surveys

Online surveys were used to elicit preferences for all five of the research topics described above. Two of the topics – ocean outfalls and water pressure – were covered by the same questionnaire. Each of the four questionnaires had a version for citizens to complete on behalf of their households and a version for business owners or managers to complete on behalf of their small-medium enterprises (SMEs). As discussed in the introductory chapter, the questionnaires covering water interruptions and wastewater overflows used a discrete choice experiment technique to elicit WTP for changes in the nature and risk of different types of service failure events. The questionnaires covering digital meters, ocean outfalls and water pressure used a contingent valuation technique to elicit WTP for the relevant project/program proposal under consideration.

3.1 Online surveys

Topic	Versions	Stated preference technique	Number of waves of fieldwork
Water interruptions	Household and business versions	Discrete choice experiment	3
Wastewater overflows	Household and business versions	Discrete choice experiment	3
Digital meters	Household and business versions	Contingent valuation	2
Ocean outfalls and water pressure	Household and business versions	Contingent valuation	3

Source: CIE

All of the questionnaires (see Appendices B to E) followed a similar format, comprising:

- a welcome, with instructions and information about privacy and contact details;
- screening questions to ensure representative samples that exclude respondents with potential conflicts of interest and respondents that do not pay any amount for water and wastewater;
- a question about the amount the respondent pays for water and wastewater each quarter;
- information about the topic, including its impact on customer outcomes and what Sydney Water can do to influence those outcomes;
- a 'cheap talk' script, reminding respondents that their answers to the stated preference question(s) will influence Sydney Water decisions about customer outcomes and bills;

- stated preference questions (either six DCE questions or one CV question, depending on the topic – discussed in further detail below);
- debriefing questions about the motivation behind and approach taken by the respondent to the stated preference question(s); and
- questions about the respondent's characteristics and experiences relevant to the topic.

The questionnaires were developed through several stages of review and testing, including:

- review and input from Sydney Water staff;
- review by internal peer reviewer, Professor Riccardo Scarpa (see Appendix A); and
- multiple waves of survey fieldwork.

Stated preference questions

Discrete choice experiments

There are several important decisions that must be made when designing a DCE. These include:

- the service attributes to be included in the choice tasks and how those attributes should be defined;
- the number of alternatives to be included in each choice task and whether one of the alternatives should represent the status quo;
- the number of questions to be answered by each respondent;
- the levels that the service attributes can take in the questions;
- the combinations of attribute levels in each question (that is, the experimental design);
- the order in which questions are presented to each respondent; and
- the information, instructions and/or questions used to 'prime' respondents for the choice.

The decisions taken in relation to these matters in the present study are discussed in the remainder of this chapter.

Service attributes

The attributes included in the water interruptions DCE were:

- Short unplanned interruptions – chance each year of an interruption lasting 1-3 hours (measured in terms of the number of properties in 1000 experiencing the event);
- Long unplanned interruptions – chance each year of an interruption lasting 6-8 hours (properties in 1000);
- Repeat unplanned interruptions – chance of experiencing three interruptions in a year (properties in 1000);

- Planned interruptions – chance each year of a planned interruption lasting 4-6 hours (properties in 1000); and
- Cost – the permanent change in the amount you pay for water each year ($).

These attributes were designed to align with the categories of interruptions being measured for the purpose of a cost-benefit analysis of alternative system performance standards. The existing water continuity standard in Sydney Water's operating licence is defined in terms of:

- the number of properties experiencing unplanned interruptions lasting longer than five hours per year; and
- the number of properties experiencing three or more unplanned interruptions lasting longer than one hour per year.

Changes in Sydney Water network management to meet different standards may necessitate or result in changes in the number of planned or short unplanned interruptions.

Analysis of data by Sydney Water showed that:

- the average duration of unplanned customer interruptions lasting less than five hours was around two hours;
- the average duration of unplanned customer interruptions lasting longer than five hours was around seven hours; and
- the average duration of a planned customer interruption was around five hours.

The attributes relating to short, long and planned interruptions in the DCE were defined as interruptions lasting ±1 hour around these averages.

The cost attribute was defined as an ongoing payment (or saving) because of the ongoing nature of the changes in costs under alternative system performance standards. The attribute was defined as a change in the bill amount, rather than a total bill, to limit the cognitive burden of comparing alternatives.

The units of measurement were set at 'properties in 1000' for each of the interruptions attributes. Our review of literature on communicating small probabilities indicated that this 'natural frequency' format is the format that is interpreted most accurately by respondents (e.g. Hoffrage et al 2000). This constant-denominator format is more readily understood than constant-numerator formats, such as '1 in *X*' years (Barratt et al 2005).

To assist respondents in interpreting the frequencies, we included the following text in the instructions given prior to the choice tasks:

> The chance of interruptions happening is expressed as the number of properties in every 1000 experiencing an interruption each year. On average, there are roughly 3000 properties in a suburb. So, 1000 properties is around one third of a suburb.

During the first and smallest wave of fieldwork only, the DCE also included the following attribute:

- Notice – amount of notice given before water supply is turned off (hours).

This attribute was removed from the second and third waves of fieldwork to simplify the choice task and improve the statistical significance of estimates of WTP for attributes of critical importance to the imminent cost-benefit analysis, particularly the 'long unplanned interruptions' attribute, which was one of the least statistically significant attributes in the analysis of the Wave 1 data.

The attributes included in the wastewater overflows DCE were:

- chance of a wastewater overflow on your property each year (properties in 10 000);
- chance of three wastewater overflows on your property each year (properties in 10 000);
- time taken to stop overflow and clean affected area (hours); and
- the permanent change in the amount you pay for wastewater services each year ($).

As with the water interruptions attributes, these attributes were designed to align with inputs required for a cost-benefit analysis of alternative system performance standards. The wastewater overflow standard is defined in terms of:

- the number of properties experiencing an uncontrolled overflow in dry weather per year; and
- the number of properties experiencing three or more uncontrolled overflows in dry weather per year.

The cost attribute was defined in the same way as for the water interruptions DCE. The units of measurement for the attributes relating to chance of overflows were defined in natural frequency format for the reasons discussed in relation to water interruptions attributes above; however, the denominator was increased to 10 000 properties for the wastewater DCE to reflect the smaller probabilities of these events.

Number of alternatives in each task

Both the water interruptions and wastewater overflows questionnaires presented three alternatives in each choice task, with one of those alternatives being the status quo. This design was judged to strike an appropriate balance between statistical power and task complexity. Previous studies have found that statistical significance for a given sample size has been low where choice tasks presented only a status quo alternative and a single change option (for example, see Rolfe and Bennett 2009). Presenting four or more alternatives in each choice task was judged to be too cognitively demanding, based on feedback from participants in past studies (such as McNair and Scarpa 2016).

One of the alternatives was specified as the status quo to account for reference-dependent decision making, for which there is now a large body of evidence from behavioural economics, including in support of prospect theory (Kahnemann and Tversky 1979). Including the status quo alternative allows for the estimation of any asymmetric valuation of gains and losses.

McNair and Scarpa 2016 note there is an ongoing debate on the merits of including a status quo alternative in choice tasks that simulate markets from which individuals cannot practicably opt out:

> some studies have excluded the status quo alternative from choice tasks on the basis that respondents typically exhibit a strong bias towards the status quo option that is unrelated to the attribute levels. The concern is that this bias is driven to some extent by an unwillingness to do the cognitive work necessary to express true preferences. Accent Market Research has tended to use forced choices (choices with no status quo alternative) in its studies for UK water companies and notes that this approach is consistent with the majority view of practitioners surveyed as part of the UKWIR 2011 study (Accent 2013b, p. 32).

On the basis of the weight of evidence relating to reference-dependent choice, the McNair and Scarpa (2016) study included a status quo alternative in all choice tasks and found strong evidence for asymmetric preferences. Given that finding and the similarity of that study to the present study we decided to include a status quo alternative in all choice tasks.

Number of questions per respondent

Both the water interruptions and wastewater overflows questionnaires included six choice tasks. The risk of respondents dropping out of self-administered questionnaires increases with the number of choice tasks presented. The number of respondents required to obtain statistically significant estimates of WTP reduces with the number of choice tasks presented to each respondent. A sequence of six choice tasks per respondent was judged to strike an appropriate balance between these two considerations.

Service attribute levels

The service attribute levels used in the water interruptions and wastewater overflows surveys are presented in table 3.2 and table 3.3.

The levels for the 'current service' alternative were based on average historical performance data provided by Sydney Water. The ranges in levels for the change alternatives were selected to at least cover the service levels expected to be included in the cost-benefit analysis of alternative system performance standards. They were selected to be large enough to enable statistically significant estimation, but not so large as to be perceived as infeasible by respondents.

Inclusion of both positive and negative changes in levels relative to the current service level to enable separate estimation of WTP for improvement and WTA compensation for degradation of service.

To account for variation in the size of businesses and the likely positive relationship between business size with WTP, the cost attribute levels were calculated as a proportion of business respondents' estimated quarterly bills.

Where practicable, the number of levels included in the vector for each attribute was set at a factor of the number of questions in the experimental design, so that each level was presented to respondents on a similar number of occasions.

A number of changes were made over the course of the three waves of fieldwork. After the first and second waves of fieldwork, the vectors of levels for the bill attribute were

adjusted to ensure they covered the estimated WTP/WTA for the best/worst combination of attribute levels using the data gathered to that point.

A number of other changes were made to the water interruptions attribute levels to improve the statistical significance of estimates of WTP for the 'long unplanned interruptions' attribute, which was relatively weak in estimations on the Wave 1 data. In Wave 2, the 'notice' attribute was removed (as discussed above) and the status quo attribute levels were excluded from the vectors of alternative levels to enable the use of an 'optimal orthogonal-in-the-difference' experimental design, which is discussed in more detail below. In Wave 3, the range of levels (and increment between levels) for the 'short unplanned interruptions' attribute were decreased, the range of levels for the 'long unplanned interruptions' attribute were increased, and the status quo levels were reintroduced into the vector of levels for all attributes other than 'long unplanned interruptions'.

3.2 Water interruptions service attribute levels

Attribute	Current package level	Alternative levels
Short unplanned interruptions – chance each year of an interruption lasting 1-3 hours (properties in 1000)	120	Wave 1: 60, 90, 120, 150, 180 Wave 2: 60, 90, 150, 180 Wave 3: 100, 110, 120, 130, 140
Long unplanned interruptions – chance each year of an interruption lasting 6-8 hours (properties in 1000)	16	Wave 1: 8, 12, 16, 20, 24 Wave 2: 8, 12, 20, 24 Wave 3: 5, 10, 20, 25
Repeat unplanned interruptions – chance of experiencing three interruptions in a year (properties in 1000)	3	Wave 1: 1, 3, 6, 10 Wave 2: 1, 5, 7, 10 Wave 3: 1, 3, 5, 10
Planned interruptions – chance each year of a planned interruption lasting 4-6 hours (properties in 1000)	20	Wave 1/3: 10, 15, 20, 25, 30 Wave 2: 10, 15, 25, 30
Notice – amount of notice given before water supply is turned off (hours)	Wave 1: 24 Wave 2/3: N/A	Wave 1: 4, 24, 48 Wave2/3: N/A
Cost – the permanent change in the amount you pay for water each year. ($)	No change	Citizens: Wave 1/2: -30, -15, -10, -5, -2, 2, 5, 10 Wave 3: -20, -10, -5, -2, 0, 2, 5, 10 Business cost levels were equal to the citizen levels above divided by 250 and multiplied by the respondent's estimated quarterly amount paid for water and wastewater services.

Source: CIE

3.3 Wastewater overflows service attribute levels

Attribute	Current package level	Alternative levels
Chance of a wastewater overflow on your property each year (properties in 10 000)	50	10, 30, 80, 120
Chance of three wastewater overflows on your property each year (properties in 10 000)	1	'Almost never', 1, 3, 5
Time taken to stop overflow and clean affected area (hours)	5	3, 4, 6, 7
The permanent change in the amount you pay for wastewater services each year ($)	No change	Wave 1: -40, -20, -10, -5, 2, 5, 10, 20 Wave 2/3: -75, -25, -10, -5, 0, 2, 5, 10

Source: CIE

Experimental designs

To conduct the DCE, the analyst needs to assign combinations of attribute levels to the various alternatives and questions. These combinations are referred to as the experimental design. The experimental design has a direct impact on the statistical significance of estimates of WTP. If some information about preferences is known, it is possible to generate an experimental design that can elicit statistically significant estimates of WTP from a smaller number of respondents than a randomly generated design.

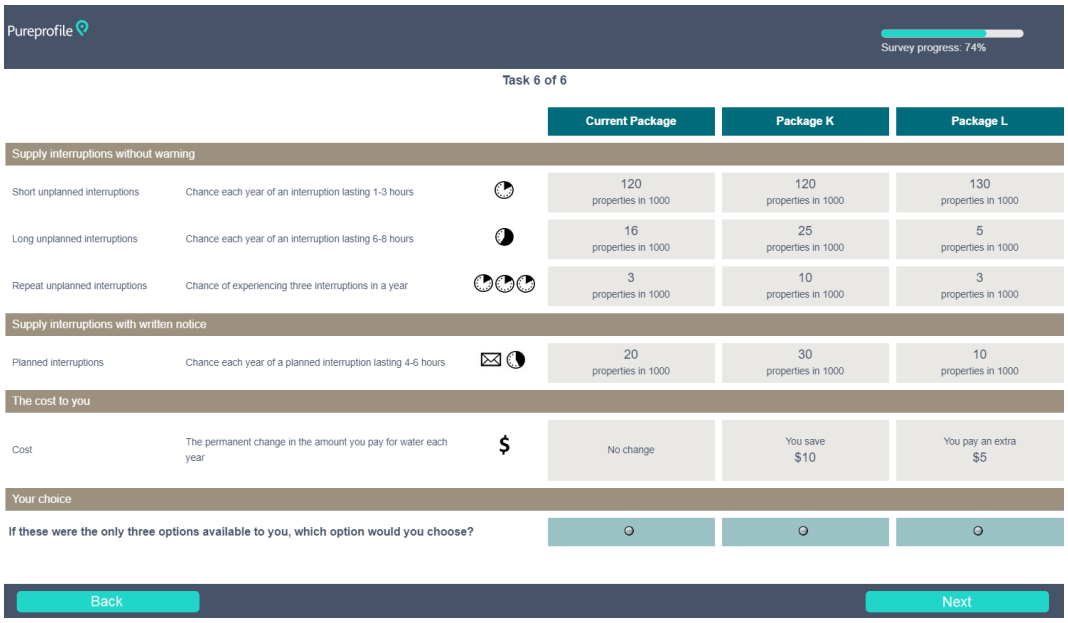
This study used an adaptive experimental design process, in which three separate designs were used for each DCE survey – one for each wave of fieldwork. One wave of fieldwork for each DCE survey used an 'optimal orthogonal-in-the-differences' design. This type of design is constructed such that attributes do not take the same level across alternatives. Manual adjustments were made to ensure the design did not include any dominated alternatives (i.e. an alternative that is not better on at least one attribute when compared to each other alternative in the same choice task). These designs may not turn out to be particularly efficient *ex post*, but this represents a prudent approach to designing DCEs when little information is available about population preferences over the hypothetical alternatives.

The designs for the two other waves of fieldwork for each DCE were generated to minimise C-error (the sum of the variances of the WTP estimates for each service attribute), except for the design used for Wave 3 of the wastewater overflows survey, which was generated to minimise D-error (Scarpa and Rose 2008). This exception was made due to the uncertainty about how to compute the C-error in the presence of effects-coded (non-linear) parameter estimates on the cost attribute in the prior utility function. The prior parameter estimates used to generate the efficiency criteria were based on estimates of WTP from basic multinomial logit models run on the data collected in the waves of fieldwork undertaken to that point. Constraints were included in the design search to preclude dominated alternatives and to set ranges for the number of times each attribute level could appear in the design. The searches were performed using the Ngene software package.

The water interruptions designs comprised five blocks of six questions (except in Wave 2 in which the design comprised only four blocks) and the sewerage overflows designs comprised four blocks of six questions, with each respondent answering only one randomly selected block. The reason for using multiple blocks was to improve design efficiency and limit the impact of any single choice task on the results. The order in which questions from the blocks were presented to respondents was randomised to ensure the WTP estimates remain unaffected by ordering effects (for example, see McNair et al 2011a).

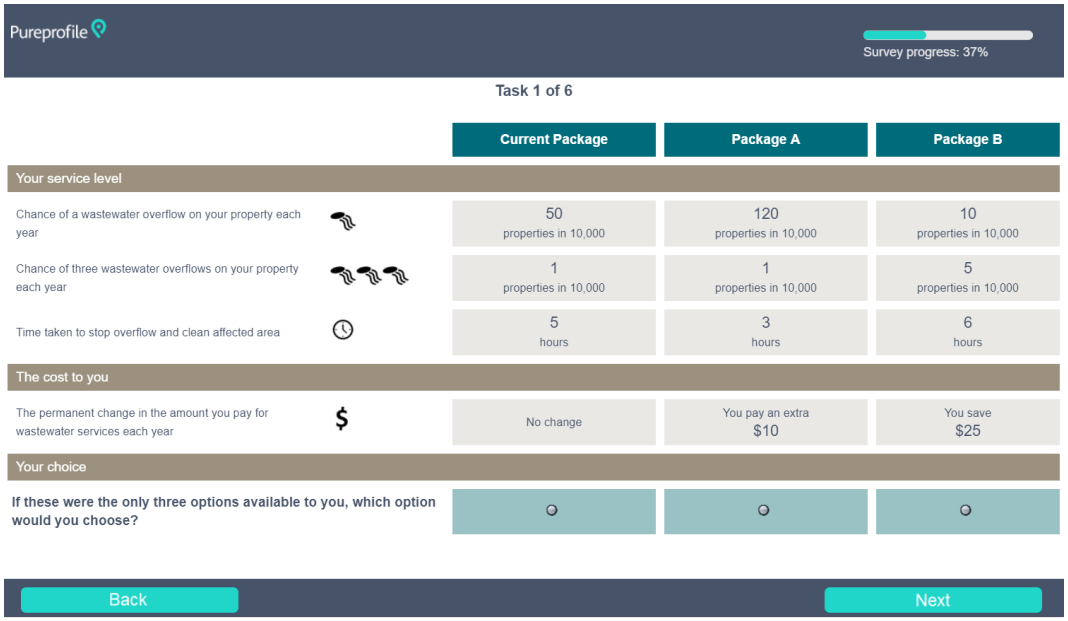
Examples of the choice questions used in the two surveys are presented in figure 3.4 and figure 3.5.

3.4 Example of a choice task in the water interruptions survey



Data source: CIE

3.5 Example of a choice task in the wastewater overflows survey



Data source: CIE

Instructions, priming and debriefing

Before being presented with the choice tasks, respondents were shown an example of a choice task. The cost levels in the examples were replaced with generic '$X' and $Y' to ensure the examples did not lead to any anchoring bias. Instructions were provided in relation to interpreting the 'X properties in 1000' units of measurement in percentage terms and information was provided on the average number of properties in a Sydney suburb.

A 'cheap talk' script was included in each survey to minimise hypothetical bias. The script provided in the water interruptions questionnaire was as follows.

> **Answering questions about hypothetical situations**
>
> Research has shown that people tend to respond differently to hypothetical situations than they would in real life situations. This is most likely because they don't actually have to follow through with their choices in hypothetical situations. Although the situations presented in this survey are hypothetical, your responses will influence decisions about the management of the water system in Sydney, the Blue Mountains and the Illawarra, which will affect the number of water supply interruptions that happen and also the amount you pay for water. Therefore, please answer the questions as if you were really facing these decisions.

A list of debriefing questions was included to probe the respondent's decision-making process and gather information on their characteristics. The questions covered:

- the extent of any difficulty experienced when answering choice questions;
- perceptions of the accuracy of the 'current package' and feasibility of the service alternatives in the choice questions;
- the way respondents answered any questions with alternatives they perceived to be inaccurate or infeasible (where applicable);

- reasons for choosing the status quo alternative in all questions (where applicable);
- perceptions of how influential the survey would be on Sydney Water's decisions;
- the respondent's experience of water supply interruptions/wastewater overflows; and
- a range of socioeconomic/business characteristics.

Contingent valuation

In the CV surveys, we adopted the referendum (single dichotomous choice question) format in which the proposed program is offered to the respondent at a specified price and the respondent is asked whether they would vote for the program. Although this approach would appear to elicit very little about preferences and WTP from each individual respondent, it has been shown by more than two decades of academic research to be the most robust and rigorous of the available techniques. We decided against using an open-ended format in which respondents are directly asked their WTP or using follow-up questions with different price levels to narrow the respondent-specific information about WTP, since both approaches are known to introduce biases.

The questions for the three topics were as follows.

> While digital meters would deliver the benefits described in this survey, they may be more expensive than ordinary meters. We are interested in knowing if these benefits would be of value to you as a customer. If a program to install digital meters would permanently increase the amount you pay for water and wastewater services by *$X* per quarter would you vote for the program?
>
> Sydney Water could do a project to stop the daily release of raw wastewater from cliff face outfalls so that they instead release only when it rains. If this project added a one-off amount of *$X* to one of your water and wastewater bills, would you vote for the program?
>
> If a program to improve water pressure to 130 worst-served customers added a one-off amount of *$X* to one of your water and wastewater bills, would you vote for the program?

The vectors of levels that *$X* could take in each of the three topics are set out in table 3.6.

3.6 Price levels for contingent valuation questions

Topic	Payment vehicle	Price levels – citizens	Price levels – businesses
		$	Per cent
Digital meters	Permanent increase in the amount you pay for water and wastewater services per quarter	1, 3, 5, 7, 10, 15	0.5, 1.0, 1.5, 2.0, 3.0, 5.0
Wastewater outfalls	One-off amount added to one of your water and wastewater bills	1, 3, 5, 7, 10, 15, 25, 35, 50	Wave 1/2: 0.5, 1.0, 1.5, 2.0, 3.0, 5.0, 7.5, 10.0, 15.0 Wave 3: 25.0, 40.0
Water pressure	One-off amount added to one of your water and wastewater bills	1, 3, 5, 7, 10, 15	0.5, 1.0, 1.5, 2.0, 3.0, 5.0

Source: CIE

The response options to the valuation question were a simple yes/no in the initial Wave 1 fieldwork. Due to concerns about potential 'yea saying', we revised the response options to the following certainty scale in Wave 2.

At that cost to me, I definitely would vote for the program

At that cost to me, I probably would vote for the program

At that cost to me, I am not sure whether I would vote for the program

At that cost to me, I probably would not vote for the program

At that cost to me, I definitely would not vote for the program

A 'cheap talk' script was included immediately prior to each of the CV questions to mitigate hypothetical bias. The script told respondents that their answer would affect the decision about the relevant service outcomes and also the amount they pay for water and wastewater services. It also reminded respondents that their income is limited and there may be other things they want to pay for.

Following the CV questions, respondents were asked about the reasons for their decision, the extent to which they believed the survey would affect Sydney Water decisions and a range of questions about their characteristics.

4 The sample of customers

Recruitment

The fieldwork was conducted in August and September 2018. All respondents were sampled through the Pureprofile online panel and were compensated for their time through Pureprofile's rewards system, which offers cash, e-gift cards and movie tickets.

Businesses were identified by asking respondents whether they were a business owner or sole trader with a commercial premises or responsible for managing business operations at a commercial premises.

Citizens were screened out if they or anyone else in their household works in water supply and wastewater services, market research, for IPART, for NSW Health in a role related to water quality regulation or for the NSW Environment Protection Authority. Similarly, businesses were screened out if they operate in the water and wastewater service or market research industries.

Respondents were also screened out if they indicated that they do not pay Sydney Water bills or any amount for water and wastewater separate from rent. These respondents are not in a position to make the price-service trade-offs examined in this study, since they are unaffected by the payment vehicle.

Soft quotas were set using Australian Bureau of Statistics data for the 15 SA4 regions covering Sydney Water's operating area for age, gender and location of citizens and for employment size, industry and location of businesses.

4.1 Sample sizes

Survey	Wave 1	Wave 2	Wave 3	Total
	Citizens / Businesses	Citizens / Businesses	Citizens / Businesses	Citizens / Businesses
Water interruptions	117 / 35	88 / 34	577 / 250	782 / 319
Wastewater overflows	131 / 32	248 / 64	430 / 209	809 / 305
Digital meters	155 / 77	234 / 656	N/A	811 / 311
Ocean outfalls and water pressure	142 / 82	665 / 223	0 / 65	807 / 370

Source: CIE

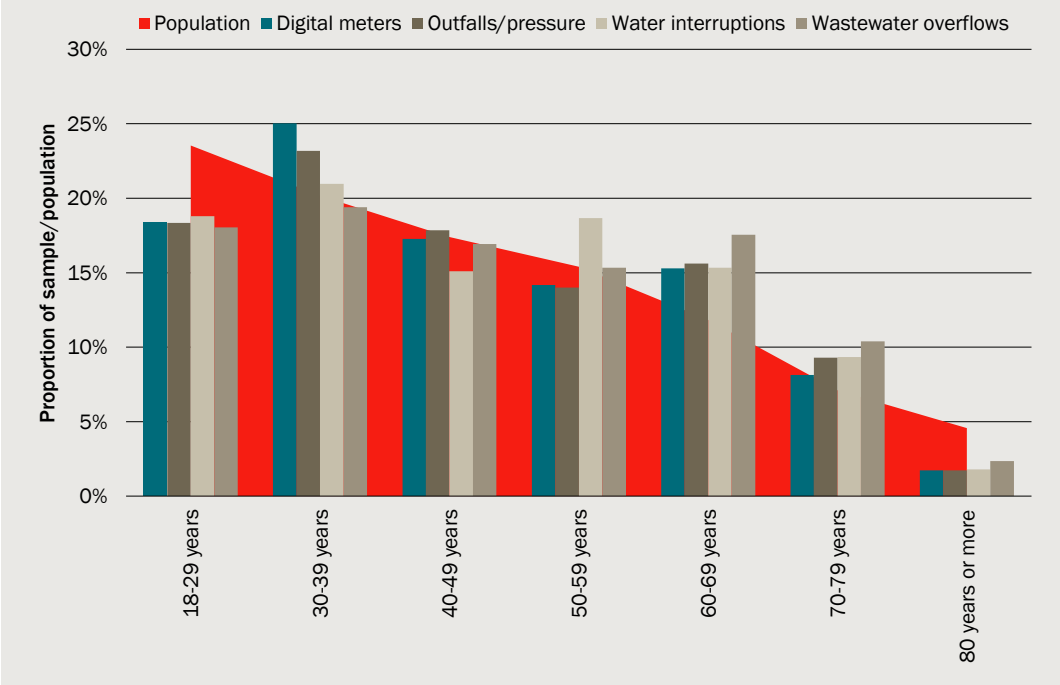
Citizens

The population for which we want a representative sample is the population of household decision makers. Data on the characteristics of this subset are not available. In this section we compare the characteristics of our sample with the full population of persons aged 18 and over in the Sydney Water operating area. Some differences in characteristics are expected as a result.

Age

The age profile of the sample is similar to that of the population. The undersampling of citizens aged under 30 years is expected since this group is less likely to be a decision maker within their household.

4.2 Citizen respondents by age

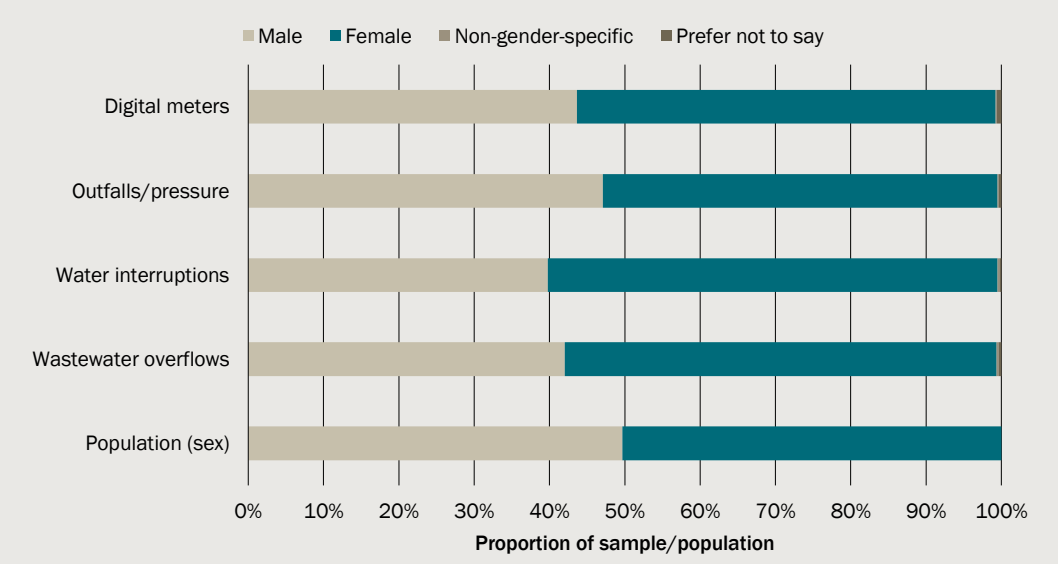


Note: n=811 in Digital Meters, n=807 in Outfalls/Pressure, n=782 in Water Interruptions, n=809 in Wastewater Overflows
Data source: CIE, ABS 3235.0

Gender

Females were slightly oversampled relative to males in all four surveys (see figure 4.3 on the following page).

4.3 Citizen respondents by gender

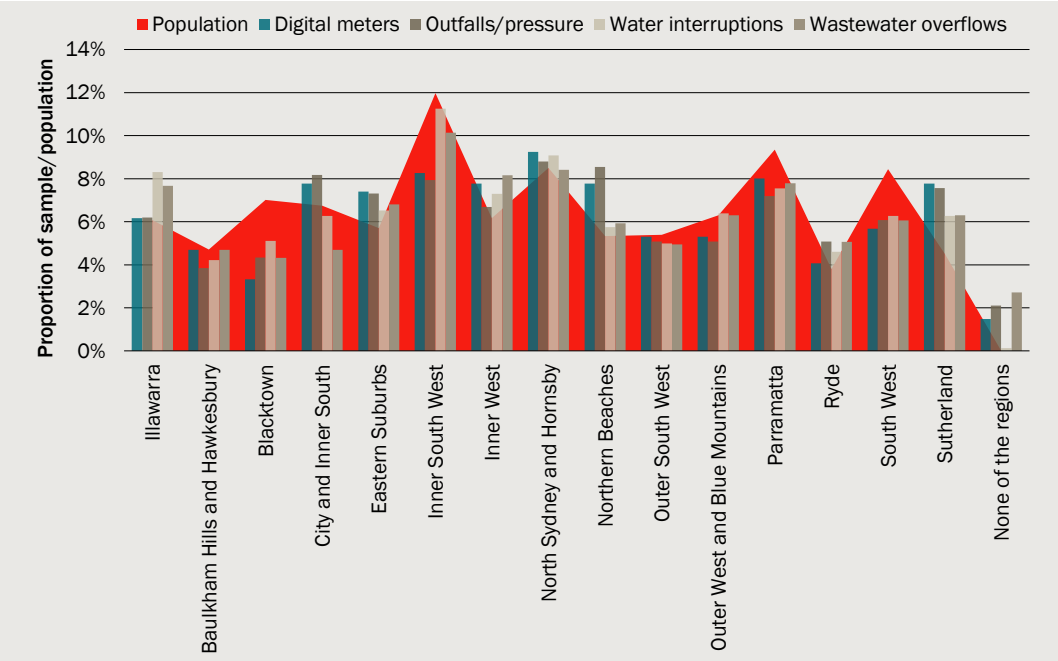


Note: n=811 in Digital Meters, n=807 in Outfalls/Pressure, n=782 in Water Interruptions, n=809 in Wastewater Overflows
Data source: CIE, ABS 3235.0

Location

Citizen respondents represent a good spread of locations across Sydney Water's operating area. The mix is similar to that of the population, with the exception of some undersampling in Blacktown and South West Sydney and some oversampling in Sutherland.

4.4 Citizen respondents by location



Note: n=811 in Digital Meters, n=807 in Outfalls/Pressure, n=782 in Water Interruptions, n=809 in Wastewater Overflows
Data source: CIE, ABS 3235.0

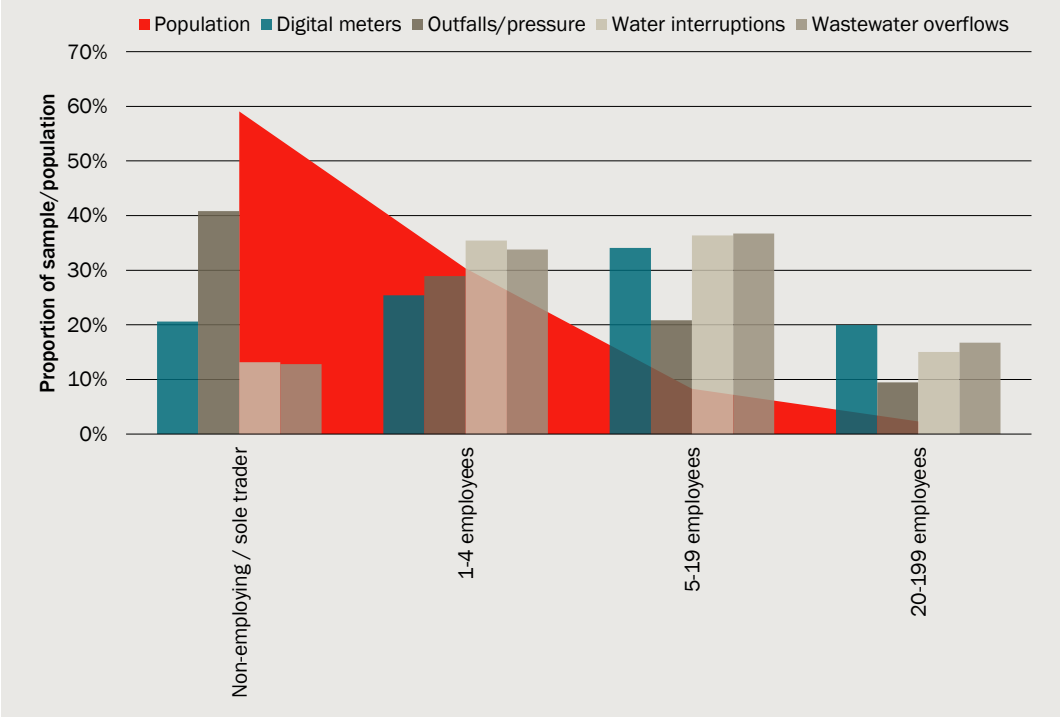
Businesses

The population for which we want a representative sample is the population of businesses operating on commercial premises, as distinct from businesses operating from home or solely on-site with clients. Data on the characteristics of this subset of businesses are not readily available. In this section we compare the characteristics of our sample of businesses with the full population of businesses in Sydney Water's operating area, regardless of whether they operate from commercial premises. Some differences in characteristics are expected as a result.

Employment size

Relative to the population of businesses sole traders were undersampled and medium businesses were oversampled. This is likely to be a reflection of the fact that we screened out businesses without a commercial premises and the difference may therefore reflect a more accurate sampling of the population of businesses with commercial premises.

4.5 Business respondents by employment size



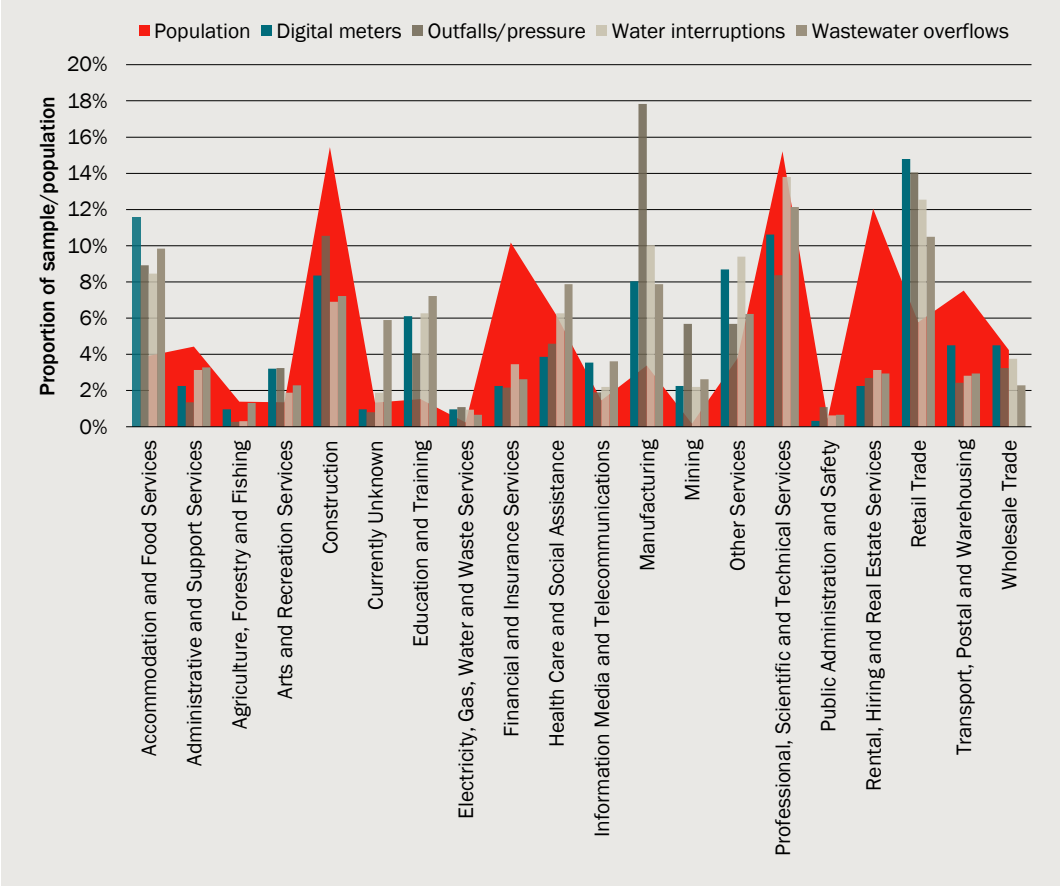
Note: n=311 in Digital Meters; n=370 in Outfalls/Pressure, n=319 in Water Interruptions, n=305 in Wastewater Overflows
Data source: CIE, ABS 8165.0

Industry

Sampling businesses by industry in proportions matching the underlying population proved difficult. Nevertheless, a range of industries are represented in the samples. Relative to the population of all businesses, manufacturing, retail trade and

accommodation and food services are overrepresented in the sample, while financial and insurance services and rental, hiring and real estate services are underrepresented.

4.6 Business respondents by industry

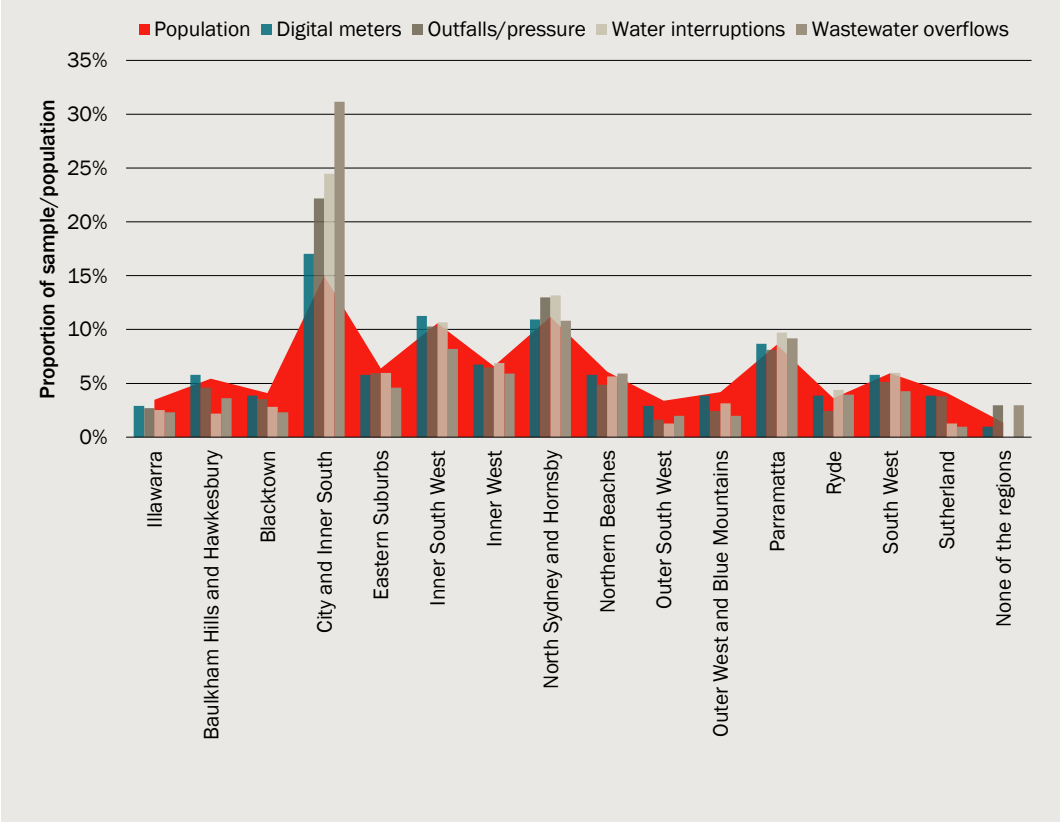


Note: n=311 in Digital Meters; n=370 in Outfalls/Pressure, n=319 in Water Interruptions, n=305 in Wastewater Overflows
Data source: CIE, ABS 8165.0

Location

The mix of business locations in the sample matches the mix in the population very closely, with the exception of some oversampling of businesses in the City and Inner South in the water interruptions and wastewater overflows surveys (see figure 4.7 on the following page).

4.7 Business respondents by location



Note: n=311 in Digital Meters; n=370 in Outfalls/Pressure, n=319 in Water Interruptions, n=305 in Wastewater Overflows

Data source: CIE, ABS 8165.0

5 Results – water supply interruptions

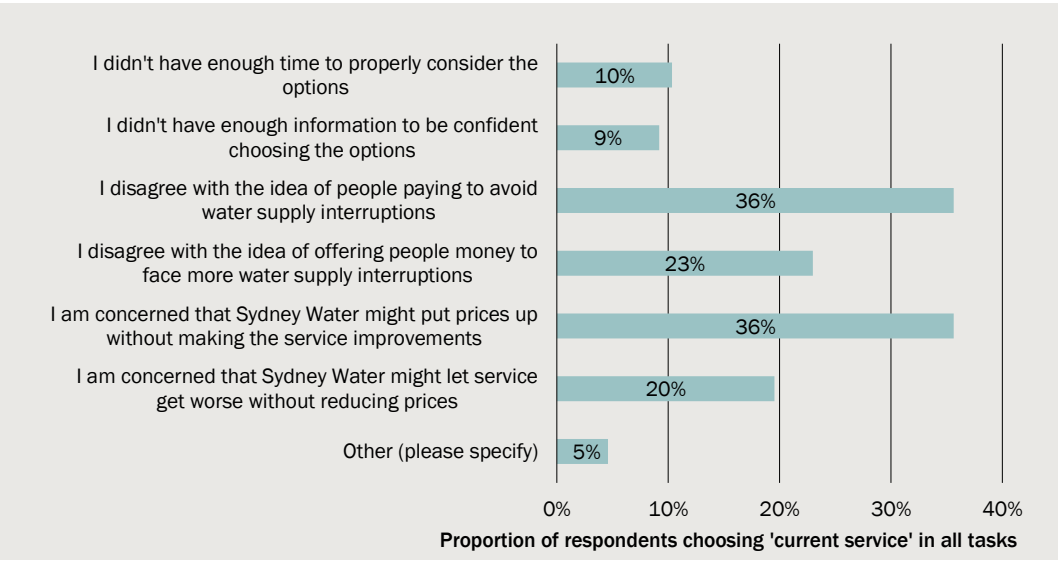
We estimated numerous models on the data to identify a final set of selected models that capture the most important relationships for the research questions. Alternative specifications that were estimated include:

- models for capturing unobserved heterogeneity, including mixed logit models;
- interactions between respondent characteristics and model parameters to capture observed heterogeneity;
- interactions between service attributes;
- asymmetric valuation of gains and losses; and
- non-linear (e.g. logarithmic) relationships between utility/WTP and service attributes.

The models chosen following this process are set out below.

The models of customer choice were estimated on data excluding respondents who chose the 'current service' option in all six of the choice tasks presented to them – some 87 respondents. This choice behaviour is called 'serial non-participation' and it indicates that respondents are not trading off the service and price attributes. The decision whether to include these respondents in the estimation primarily affects the magnitude of the 'status quo bias' estimated in the model. When conducting cost-benefit analysis, the analyst needs to decide whether to treat this apparent disutility from any change as a true welfare effect or a source of bias that needs to be excluded from welfare estimates. To assist with this decision, the reasons given by respondents for serial non-participation are shown in figure 5.1. Serial non-participation appears to have been motivated primarily by protest at the concept of price-service trade-offs and distrust of Sydney Water.

5.1 Reasons for serial non-participation in the water interruptions survey



Note: n=87 (respondents choosing 'current service' in all tasks

Data source: CIE

Models of customer choice

Households

Our selected model of household choice has the following features:

- Panel mixed multinomial logit model, with fixed parameters for cost-related attributes and random (normal distribution) parameters for service attributes, allowing for full correlation between the distributions of the random parameters.[2]
- The model does not include interactions between the service attributes presented in the choice tasks, since including interactions did not significantly improve model fit.
- Inclusion of an interaction between the cost variable with an indicator variable for whether the cost change is positive or negative, since there is strong evidence in support of asymmetry in WTP for service improvement and WTA compensation for service degradation.
- Linear relationships between WTP and each service attribute, except for the 'notice' attribute which entered the estimation as effects-coded variables to allow for non-linear utility over the number of hours of notice given for planned interruptions.

2 The state of the art in modelling DCE data is currently the panel mixed multinomial logit model estimated in WTP space. We decided against using this type of model as the primary model, since it cannot easily accommodate asymmetry in WTP for service improvement and WTA compensation for service degradation. This asymmetry was marked and had a considerable impact on estimates of average WTP in this study, consistent with previous findings in McNair and Scarpa (2016). In our view capturing this asymmetry is more important than finessing the estimation of unobserved heterogeneity in preferences in this study.

The model shows that:

- respondents made considered choices on the basis of the attribute levels presented, as evidenced by the relatively large z-values on the parameters estimates;
- respondents exhibited a bias towards the status quo on average, however, as one would expect, there is also evidence of significant heterogeneity in this preference, as evidenced by the standard deviation on the status quo constant being much larger than the mean;
- there is considerable variation in household preferences across all of the service attributes included in the choice tasks, as evidenced by the statistically significant estimates of standard deviation for the random parameters;
- respondents' WTP for service improvements is lower than the compensation they would require for the equivalent service degradation, as evidenced by the significant positive coefficient on the interaction variable between change in bill and the dummy variable for a bill increase (the asymmetry between gains and losses is a well-known phenomenon in consumer psychology); and
- male respondents are more cost-sensitive (i.e. have lower WTP) than other respondents.

5.2 Model of household choice of water interruptions scenarios

	Coefficient	Z value
Fixed parameters		
The permanent change in the amount you pay for water each year ($)	-0.1730	-12.68
Amount of notice given before water supply is turned off: 4 hours (effects coded =1 when 4 hours, =0 when 48 hours, =-1 when 24 hours)	-0.4629	-3.86
Amount of notice given before water supply is turned off: 48 hours (effects coded =1 when 48 hours, =0 when 4 hours, =-1 when 24 hours)	0.4694	4.41
Interactions with 'The permanent change in the amount you pay for water each year'		
x dummy variable for bill increase (=1 for bill increase, =0 otherwise)	0.1012	6.46
x dummy variable for male (=1 if male, =0 otherwise)	-0.0277	-3.83
Random parameters: means		
Alternative-specific constant (=1 for current package, =0 otherwise)	0.1841	2.65
Short unplanned interruptions: chance each year of an interruption lasting 1-3 hours (properties in 1000)	-0.0105	-6.88
Long unplanned interruptions: chance each year of an interruption lasting 6-8 hours (properties in 1000)	-0.0425	-9.98
Repeat unplanned interruptions: chance of experiencing three interruptions in a year (properties in 1000)	-0.0733	-7.46
Planned interruptions: chance each year of an interruption lasting 4-6 hours (properties in 1000)	-0.0222	-5.33
Random parameters: standard deviations		

	Coefficient	Z value
Alternative-specific constant (=1 for current package, =0 otherwise)	1.0525	16.65
Short unplanned interruptions: chance each year of an interruption lasting 1-3 hours (properties in 1000)	0.0185	8.44
Long unplanned interruptions: chance each year of an interruption lasting 6-8 hours (properties in 1000)	0.0473	4.18
Repeat unplanned interruptions: chance of experiencing three interruptions in a year (properties in 1000)	0.0591	1.41
Planned interruptions: chance each year of an interruption lasting 4-6 hours (properties in 1000)	0.0150	1.22
Random parameters: cross-parameter correlations		
ASC: Short unplanned interruptions	-0.0041	-2.41
ASC: Long unplanned interruptions	-0.0102	-1.65
ASC: Repeat unplanned interruptions	0.0058	0.43
ASC: Planned interruptions	0.0043	0.76
Short unplanned interruptions: Long unplanned interruptions	0.0403	3.73
Short unplanned interruptions: Repeat unplanned interruptions	0.0435	2.40
Short unplanned interruptions: Planned interruptions	0.0330	4.76
Long unplanned interruptions: Repeat unplanned interruptions	0.1131	4.74
Long unplanned interruptions: Planned interruptions	0.0042	0.47
Repeat unplanned interruptions: Planned interruptions	0.0074	0.56
Model fit		
Choice observations	4452	
Individuals	742	
Log likelihood	-4176	

Source: CIE

Businesses

The preferred choice model for business customers has the following features:

- Panel mixed multinomial logit model, with fixed parameters for cost-related attributes and random (normal distribution) parameters for service attributes, allowing for full correlation between the distributions of the random parameters.
- The cost attribute was defined as a proportion of the respondent's reported quarterly bill amount. This specification implies larger water users have higher WTP to avoid interruptions. No other business characteristics were included in the estimation, since none were found to be statistically significant when included as covariates.
- The model does not include interactions between the service attributes presented in the choice tasks, since including interactions did not significantly improve model fit.

- Inclusion of an interaction between the cost variable with an indicator variable for whether the cost change is positive or negative, since there is strong evidence in support of asymmetry in WTP for service improvement and WTA compensation for service degradation.
- Linear relationships between WTP and each service attribute, since logarithmic transformations did not improve model fit.

The model shows that:

- respondents made considered choices on the basis of the attribute levels presented, as evidenced by the z-values in excess of two on the parameters estimates for all attributes other than 'notice' which was included in choice tasks only for Wave 1 of the fieldwork;
- respondents' WTP for service improvements is lower than the compensation they would require for the equivalent service degradation, as evidenced by the significant positive coefficient on the interaction variable between change in bill and the dummy variable for a bill increase;
- with serial non-participators excluded, respondents evidenced some aversion to the status quo on average, however, there is significant heterogeneity in this preference, as evidenced by the standard deviation on the status quo constant being much larger than the mean; and
- there is variation in business preferences in relation to unplanned interruptions, as evidenced by the statistically significant estimate of standard deviation for the random parameters associated with short and long unplanned interruptions.

5.3 Model of business choice of water interruptions scenarios

	Coefficient	Z value
Fixed parameters		
The permanent change in the amount you pay for water each year (% of quarterly bill)	-19.5960	-4.98
Amount of notice given before water supply is turned off (hours)[a]	-0.0010	-0.12
Interactions with 'The permanent change in the amount you pay for water each year'		
x dummy variable for bill increase (=1 for bill increase, =0 otherwise)	9.4847	1.96
Random parameters: means		
Alternative-specific constant (=1 for current package, =0 otherwise)	-0.1893	-1.95
Short unplanned interruptions: chance each year of an interruption lasting 1-3 hours (properties in 1000)	-0.0069	-3.43
Long unplanned interruptions: chance each year of an interruption lasting 6-8 hours (properties in 1000)	-0.0136	-2.66
Repeat unplanned interruptions: chance of experiencing three interruptions in a year (properties in 1000)	-0.0336	-2.82
Planned interruptions: chance each year of an interruption lasting 4-6 hours (properties in 1000)	-0.0125	-2.18

	Coefficient	Z value
Random parameters: standard deviations		
Alternative-specific constant (=1 for current package, =0 otherwise)	0.8856	8.58
Short unplanned interruptions: chance each year of an interruption lasting 1-3 hours (properties in 1000)	0.0114	3.53
Long unplanned interruptions: chance each year of an interruption lasting 6-8 hours (properties in 1000)	0.0253	1.75
Repeat unplanned interruptions: chance of experiencing three interruptions in a year (properties in 1000)	0.0526	1.47
Planned interruptions: chance each year of an interruption lasting 4-6 hours (properties in 1000)	-0.0024	-0.08
Random parameters: cross-parameter correlations		
ASC: Short unplanned interruptions	-0.0023	-0.71
ASC: Long unplanned interruptions	-0.0130	-1.55
ASC: Repeat unplanned interruptions	-0.0137	-0.69
ASC: Planned interruptions	-0.0226	-2.32
Short unplanned interruptions: Long unplanned interruptions	0.0261	1.91
Short unplanned interruptions: Repeat unplanned interruptions	0.0218	0.55
Short unplanned interruptions: Planned interruptions	0.0146	0.98
Long unplanned interruptions: Repeat unplanned interruptions	0.0378	0.89
Long unplanned interruptions: Planned interruptions	-0.0284	-2.06
Repeat unplanned interruptions: Planned interruptions	0.0077	0.29
Model fit		
Choice observations	1830	
Individuals	305	
Log likelihood	-1909	

[a] Included in Wave 1 choice tasks only

Source: CIE

Estimates of average willingness to pay

Households

The estimates of average household WTP/WTA for both improvements and degradation in each of the service attributes are presented in table 5.4. Since the gender of the respondent had a statistically significant effect in the household model and males were undersampled relative to the underlying population, WTP estimates are calculated using the population mean for *male* of 0.497, rather than the sample mean of 0.417.

5.4 Household average WTP and WTA compensation for changes in water continuity

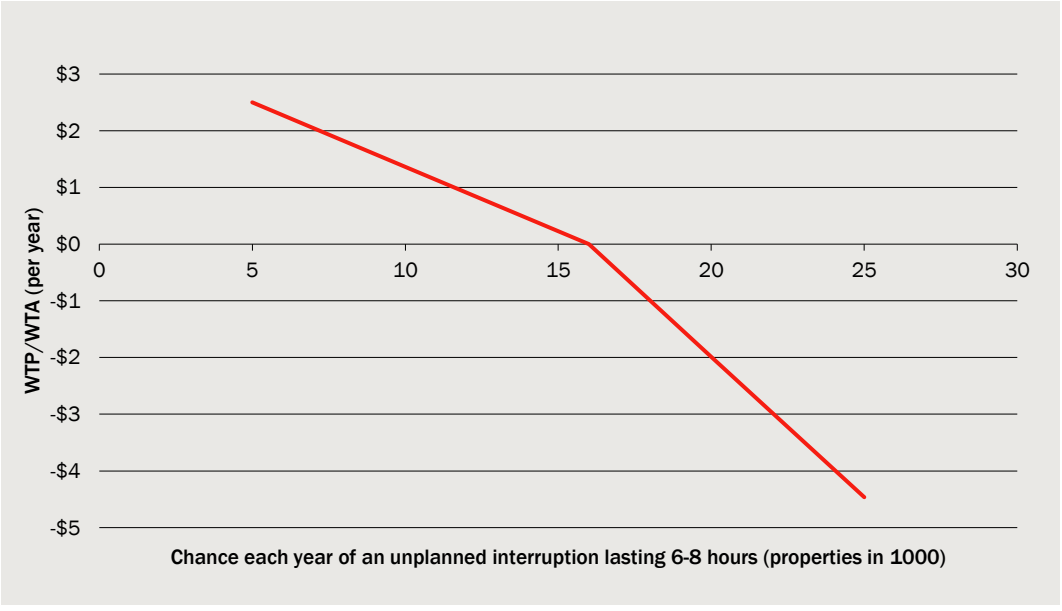
	Service improvement (WTP)	Service degradation (WTA)
	$ per year	$ per year
Change of 10 properties in 1000 in the chance of an unplanned interruption lasting 1-3 hours each year	$0.56 ($0.39, $0.73)	-$1.22 (-$1.57, -$0.88)
Change of 10 properties in 1000 in the chance of an unplanned interruption lasting 6-8 hours each year	$2.27 ($1.72, $2.82)	-$4.96 (-$5.98, -$3.94)
Change of 1 property in 1000 in the chance of experiencing three unplanned interruptions in a year	$0.39 ($0.28, $0.51)	-$0.86 (-$1.08, -$0.64)
Change of 10 properties in 1000 in the chance of a planned interruption lasting 4-6 hours each year	$1.19 ($0.76, $1.62)	-$2.59 (-$3.58, -$1.60)
Change in amount of notice given for planned interruptions from 24 hours to 48 hours	$2.51 ($1.39, $3.64)	
Change in amount of notice given for planned interruptions from 24 hours to 4 hours		-$5.41 (-$8.22, -$2.59)

Note: 95 per cent confidence intervals in parentheses, estimated at population mean for *male* = 0.497

Source: CIE

The asymmetry between WTP and WTA is illustrated in figure 5.5, which shows average household WTP/WTA compensation for changes in the likelihood of unplanned interruptions lasting 6-8 hours.

5.5 Household average WTP for changes in the chance each year of an unplanned interruption lasting 6-8 hours relative to a baseline of 16 in 1000 properties



Data source: CIE

Businesses

Estimates of average business WTP/WTA compensation for changes in each service attribute are set out in table 5.6. The confidence intervals on these estimates are wider than those on the household estimates as one would expect given the smaller sample size.

5.6 Business average WTP and WTA compensation for changes in water continuity

	Service improvement (WTP)	Service degradation (WTA)
	Percentage of annual bill	Percentage of annual bill
Change of 10 properties in 1000 in the chance of an unplanned interruption lasting 1-3 hours each year	0.09% (0.03%, 0.15%)	-0.17% (-0.27%, -0.07%)
Change of 10 properties in 1000 in the chance of an unplanned interruption lasting 6-8 hours each year	0.17% (0.02%, 0.32%)	0.34% (-0.59%, -0.08%)
Change of 1 property in 1000 in the chance of experiencing three unplanned interruptions in a year	0.04% (0.01%, 0.08%)	-0.08% (-0.14%, -0.03%)
Change of 10 properties in 1000 in the chance of a planned interruption lasting 4-6 hours each year	0.16% (0.02%, 0.30%)	-0.31% (-0.61%, -0.01%)

Note: 95 per cent confidence intervals in parentheses

Source: CIE

The model of business choice expresses WTP as a proportion of the respondent's bill, with larger water users having larger WTP. Table 5.7 uses a business customer with a quarterly water and wastewater bill of $300 (i.e. an annual bill of $1200) to provide an example of the dollar amounts that can be derived from the percentage estimates above.

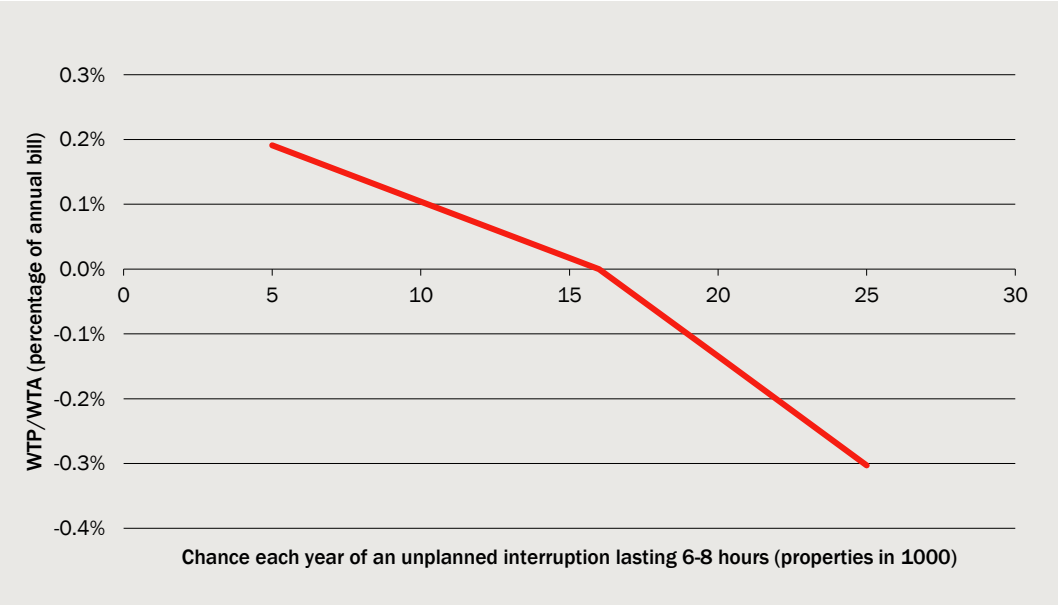
5.7 Business average WTP and WTA compensation for changes in water continuity

	Service improvement (WTP)	Service degradation (WTA)
	$ per year	$ per year
Change of 10 properties in 1000 in the chance of an unplanned interruption lasting 1-3 hours each year	$1.06	-$2.05
Change of 10 properties in 1000 in the chance of an unplanned interruption lasting 6-8 hours each year	$2.08	-$4.04
Change of 1 property in 1000 in the chance of experiencing three unplanned interruptions in a year	$0.52	-$1.00
Change of 10 properties in 1000 in the chance of a planned interruption lasting 4-6 hours each year	$1.91	-$3.69

Source: CIE

In the water interruptions models, there is a linear relationship between each service attribute and WTP/WTA. Values can therefore be calculated by interpolating or extrapolating using the figures above – though we would advise against extrapolating outside the range of levels used in the study. To illustrate this point, the relationship between WTP/WTA and the number of unplanned water interruptions lasting 6-8 hours is shown in figure 5.8.

5.8 Business average WTP for changes in the chance each year of an unplanned interruptions lasting 6-8 hours relative to a baseline of 16 in 1000 properties



Data source: CIE

Debriefing questions

There is no evidence that the cognitive burden of the survey was perceived by respondents as excessive. Only 7 per cent of respondents indicated the choice questions were very difficult, as distinct from somewhat difficult or not difficult.

Almost all respondents considered the choices on the basis of the attribute levels shown in the options. Only 4 per cent of respondents assumed that by selecting 'current package' they would get service levels they have experienced in the past, as distinct from the levels described in the question. Only 3 per cent indicated there was at least one question where they assumed they would be getting different service levels or bill impacts to those described in the options.

The survey was consequential for most respondents, with 80 per cent indicating they believe it is very likely or somewhat likely the survey will affect Sydney Water decisions.

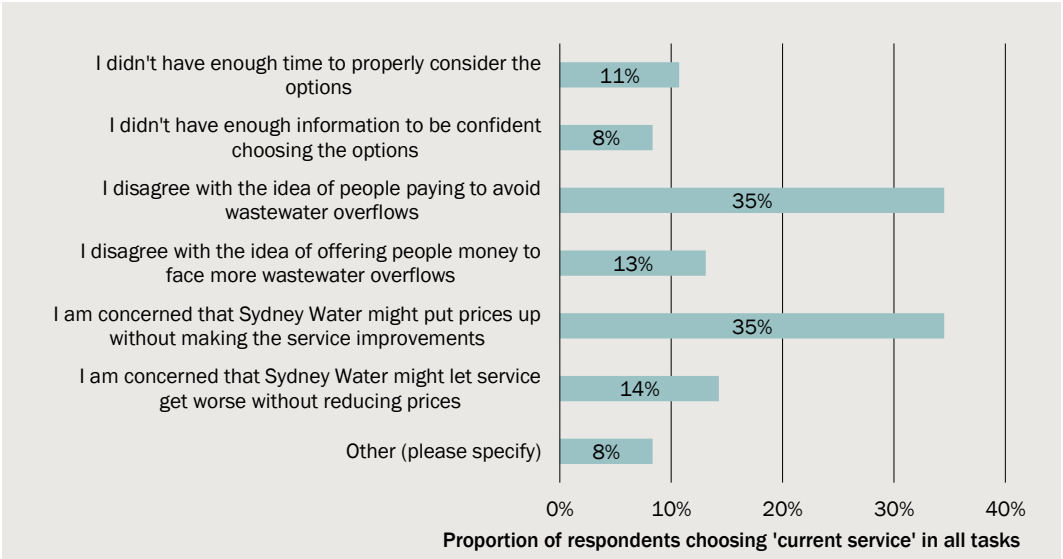
6 *Results – wastewater overflows*

As with the water interruptions estimation process described above, we estimated numerous models on the data to identify a final set of selected models that capture the most important relationships in the data and are representative of the results derived from a wider range of model specifications. Alternative specifications that were estimated include:

- models for capturing unobserved heterogeneity, including mixed logit models;
- interactions between respondent characteristics and model parameters to capture observed heterogeneity;
- interactions between service attributes, such as the chance and duration of wastewater overflows;
- asymmetric valuation of gains and losses; and
- non-linear (e.g. logarithmic) relationships between utility/WTP and service attributes.

The models chosen following this process are set out below. Consistent with the approach described in relation to the estimation of water interruptions choice models, we excluded 84 respondents evidencing 'serial non-participation'; that is, respondents who chose the 'current service' option in all six of the choice tasks presented to them. The reasons given by respondents for serial non-participation are shown in figure 6.1. Serial non-participation appears to have been motivated primarily by protest at the concept of price-service trade-offs and distrust of Sydney Water.

6.1 Reasons for serial non-participation in the wastewater overflows survey



Note: n=84 (respondents choosing the 'current service' option in all tasks

Data source: CIE

Models of customer choice

Households

In this section we present:

- a model including interactions with respondent characteristics that were found to be statistically significant (see table 6.2); and
- a model excluding interactions with respondent characteristics for the purpose of calculating average WTP (see table 6.3).

Both models have the following features:

- Panel mixed multinomial logit models, with fixed parameters for cost-related attributes and random (normal distribution) parameters for service attributes, allowing for full correlation between the distributions of the random parameters.
- The models do not include interactions between the service attributes presented in the choice tasks, since including interactions did not significantly improve model fit.
- Inclusion of an interaction between the cost variable with an indicator variable for whether the cost change is positive or negative, since there is strong evidence in support of asymmetry in WTP for service improvement and WTA compensation for service degradation.
- Logarithmic relationships to WTP for both the chance of repeat overflows and the time taken to address overflows and clean up.

The models show that:

- respondents made considered choices on the basis of the attribute levels presented, as evidenced by the large z-values on the parameters estimates for the service attributes;
- respondents' status quo bias was not significant on average, however, there is significant heterogeneity in this preference, as evidenced by the standard deviation on the status quo constant being much larger than the mean;
- there is considerable variation in household preferences in relation to all three of the service attributes, as evidenced by the statistically significant estimate of standard deviations for the random parameters associated with those attributes; and
- respondents' WTP for service improvements is dramatically lower than the compensation they would require for the equivalent service degradation, as evidenced by the highly significant positive coefficient on the interaction variable between change in bill and the dummy variable for a bill increase.

In addition, the model with respondent characteristics as covariates shows:

- respondents located in Baulkham Hills and Hawkesbury, Inner South West, or Parramatta are more cost-sensitive (i.e. have lower WTP) than other respondents;
- respondents who have experienced at least one wastewater overflow are less cost-sensitive (i.e. have higher WTP) than other respondents;
- younger respondents are less likely to choose the 'current service' option; and

- households with someone home during business hours most or all of the time are more likely to choose the 'current service' option.

6.2 Model of household choice of wastewater overflows scenarios with covariates

	Coefficient	Z value
Fixed parameters		
The permanent change in the amount you pay for wastewater services each year ($)	-0.1496	-14.64
Interactions with 'The permanent change in the amount you pay for wastewater services each year'		
x dummy variable for bill increase (=1 for bill increase, =0 otherwise)	0.1339	12.89
x dummy variable for location: Baulkham Hills and Hawkesbury	-0.0213	-3.62
x dummy variable for location: Inner South West	-0.0073	-1.98
x dummy variable for location: Outer South West	-0.0058	-1.10
x dummy variable for location: Parramatta	-0.0081	-1.79
x dummy for household income <$78 000 per year	-0.0035	-1.52
x dummy for past experience of at least one overflow	0.0080	3.44
Interactions with alternative-specific constant		
x dummy for aged under 30 years	-0.4329	-3.09
x dummy for male	-0.1565	-1.45
x dummy for someone home during business hours most/all of the time	0.2082	1.94
Random parameters: means		
Alternative-specific constant (=1 for current package)	0.1042	1.05
Chance of a wastewater overflow on your property each year (properties in 10 000)	-0.0135	-13.17
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 = properties in 10 000))	-0.5135	-10.27
ln(time taken to stop overflow and clean affected area) (ln(hours))	-1.0840	-9.98
Random parameters: standard deviations		
Alternative-specific constant (=1 for current package)	0.9785	14.79
Chance of a wastewater overflow on your property each year (properties in 10 000)	-0.0163	-13.15
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 + properties in 10 000))	0.4447	4.65
ln(time taken to stop overflow and clean affected area) (ln(hours))	1.1984	5.50
Random parameters: cross-parameter correlations		
ASC: chance of an overflow	-0.0031	-2.02
ASC: ln(1 + chance of repeat overflows)	-0.1982	-2.53
ASC: ln(time taken)	-0.1585	-0.98

	Coefficient	Z value
Chance of an overflow: ln(1 + chance of repeat overflows)	-0.4923	-6.44
Chance of an overflow: ln(time taken)	-0.3480	-2.13
ln(1 + chance of repeat overflows): ln(time taken)	0.9934	3.93
Model fit		
Choice observations	4428	
Individuals	738	
Log likelihood	-4271	

Source: CIE

6.3 Model of household choice of wastewater overflows scenarios without covariates

	Coefficient	Z value
Fixed parameters		
The permanent change in the amount you pay for wastewater services each year ($)	-0.1496	-14.88
Interactions with 'The permanent change in the amount you pay for wastewater services each year'		
x dummy variable for bill increase (=1 for bill increase, =0 otherwise)	0.1333	12.86
Random parameters: means		
Alternative-specific constant (=1 for current package)	0.0524	0.79
Chance of a wastewater overflow on your property each year (properties in 10 000)	-0.0134	-13.12
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 = properties in 10 000))	-0.5175	-10.30
ln(time taken to stop overflow and clean affected area) (ln(hours))	-1.0808	-9.96
Random parameters: standard deviations		
Alternative-specific constant (=1 for current package)	1.0030	15.08
Chance of a wastewater overflow on your property each year (properties in 10 000)	0.0165	13.27
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 + properties in 10 000))	0.4407	4.48
ln(time taken to stop overflow and clean affected area) (ln(hours))	1.1372	4.35
Random parameters: cross-parameter correlations		
ASC: chance of an overflow	-0.0030	-1.96
ASC: ln(1 + chance of repeat overflows)	-0.1955	-2.49
ASC: ln(time taken)	-0.1548	-0.95
Chance of an overflow: ln(1 + chance of repeat overflows)	0.5206	6.85
Chance of an overflow: ln(time taken)	0.3779	2.29

	Coefficient	Z value
ln(1 + chance of repeat overflows): ln(time taken)	1.0570	3.66
Model fit		
Choice observations	4428	
Individuals	738	
Log likelihood	-4296	

Source: CIE

Businesses

In this section we present two models estimated on the choices of business respondents:

- a model including interactions with respondent characteristics that were found to be statistically significant; and
- a model excluding interactions with respondent characteristics for the purpose of calculating average WTP.

Both models have the following features:

- Panel mixed multinomial logit models, with fixed parameters for cost-related attributes and random (normal distribution) parameters for service attributes, allowing for full correlation between the distributions of the random parameters.
- The models do not include interactions between the service attributes presented in the choice tasks, since including interactions did not significantly improve model fit.
- Inclusion of an interaction between the cost variable with an indicator variable for whether the cost change is positive or negative, since there is strong evidence in support of asymmetry in WTP for service improvement and WTA compensation for service degradation.
- A logarithmic relationship between WTP and repeat overflows. Other non-linear transformations tested did not improve model fit.

The models show that:

- respondents made considered choices on the basis of the attribute levels presented, as evidenced by the large z-values on the parameters estimates for the service attributes;
- after exclusion of serial non-participants, businesses were averse to the 'current service' option, however, there is significant heterogeneity in this preference, as evidenced by the standard deviation on the status quo constant being larger than the mean;
- there is considerable variation in business preferences in relation to all three of the service attributes, as evidenced by the statistically significant estimate of standard deviations for the random parameters associated with those attributes; and
- businesses' WTP for service improvements is dramatically lower than the compensation they would require for the equivalent service degradation, as evidenced by the highly significant positive coefficient on the interaction variable between change in bill and the dummy variable for a bill increase.

In addition, the model with respondent characteristics as covariates shows that respondents who have experienced an overflow are less cost-sensitive (i.e. have higher WTP) than other respondents.

6.4 Model of business choice of wastewater overflows scenarios with covariates

	Coefficient	Z value
Fixed parameters		
The permanent change in the amount you pay for wastewater services each year (% of quarterly bill)	-23.8524	-6.84
Interactions with 'The permanent change in the amount you pay for wastewater services each year'		
x dummy variable for bill increase (=1 for bill increase, =0 otherwise)	20.4652	5.75
x dummy variable for experience of an overflow	1.8850	2.32
Random parameters: means		
Alternative-specific constant (=1 for current package)	-0.5785	-5.98
Chance of a wastewater overflow on your property each year (properties in 10 000)	-0.0074	-5.96
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 + properties in 10 000))	-0.2553	-3.92
Time taken to stop overflow and clean affected area (hours)	-0.1387	-4.80
Random parameters: standard deviations		
Alternative-specific constant (=1 for current package)	0.7488	6.98
Chance of a wastewater overflow on your property each year (properties in 10 000)	-0.0124	-7.79
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 = properties in 10 000))	0.5425	5.24
Time taken to stop overflow and clean affected area (hours)	0.1474	2.38
Random parameters: cross-parameter correlations		
ASC: chance of an overflow	-0.0018	-0.81
ASC: ln(1 + chance of repeat overflows)	-0.0434	-0.36
ASC: Time taken	0.0111	0.22
Chance of an overflow: ln(1 + chance of repeat overflows)	-0.0355	-0.30
Chance of an overflow: Time taken	-0.0331	-0.66
ln(1 + chance of repeat overflows): Time taken	0.1721	3.43
Model fit		
Choice observations	1752	
Individuals	292	
Log likelihood	-1798	

Source: CIE

6.5 Model of business choice of wastewater overflows scenarios without covariates

	Coefficient	Z value
Fixed parameters		
The permanent change in the amount you pay for wastewater services each year (% of quarterly bill)	-22.5566	-6.56
Interactions with 'The permanent change in the amount you pay for wastewater services each year'		
x dummy variable for bill increase (=1 for bill increase, =0 otherwise)	20.3006	5.71
Random parameters: means		
Alternative-specific constant (=1 for current package)	-0.5732	-5.93
Chance of a wastewater overflow on your property each year (properties in 10 000)	-0.0073	-5.94
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 + properties in 10 000))	-0.2541	-3.89
Time taken to stop overflow and clean affected area (hours)	-0.1389	-4.77
Random parameters: standard deviations		
Alternative-specific constant (=1 for current package)	0.7482	6.94
Chance of a wastewater overflow on your property each year (properties in 10 000)	0.0123	7.72
ln(1 + chance of three wastewater overflows on your property each year) (ln(1 = properties in 10 000))	0.5434	5.15
Time taken to stop overflow and clean affected area (hours)	0.1645	2.97
Random parameters: cross-parameter correlations		
ASC: chance of an overflow	-0.0018	-0.84
ASC: ln(1 + chance of repeat overflows)	-0.0485	-0.39
ASC: Time taken	0.0046	0.09
Chance of an overflow: ln(1 + chance of repeat overflows)	0.0339	0.28
Chance of an overflow: Time taken	0.0299	0.59
ln(1 + chance of repeat overflows): Time taken	0.1691	3.34
Model fit		
Choice observations	1752	
Individuals	292	
Log likelihood	-1800	

Source: CIE

Estimates of average willingness to pay

Households

The estimates of average household WTP/WTA for both improvements and degradation in each of the wastewater overflows service attributes are presented in table 6.6.

6.6 Household average WTP and WTA compensation for changes in wastewater overflows

	Service improvement (WTP)	Service degradation (WTA)
	$ per year	$ per year
Change of 10 in 10 000 properties in the chance each year of a wastewater overflow on your property	$0.90 ($0.74, $1.06)	-$8.21 (-$9.80, -$6.63)
Change of 1 in 10 000 properties (from a base of 1 in 10 000 properties per year) in the chance each year of experiencing three wastewater overflows on your property	$2.40 ($1.88, $2.92)	-$12.82 (-$15.56, -$10.08)
Change of one hour (from a base of five hours) in the time taken to stop overflow and clean the affected area	$1.61 ($1.26, $1.96)	-$12.04 (-$14.66, -$9.42)

Note: 95 per cent confidence intervals in parentheses

Source: CIE

The number of wastewater overflows has linear relationships with WTP and WTA, allowing interpolation and extrapolation using the figures above (however we would advise against extrapolating beyond the range of levels used in the study). These relationships and the striking asymmetry between WTP and WTA are illustrated in figure 6.7. Interpolation and extrapolation is not so simple for the *repeat* and *time* attributes above, since they enter the model with a logarithmic transformation. WTP/WTA estimates for changes in these attributes should be calculated using the model coefficients.

6.7 Household average WTP for changes in the chance of wastewater overflows relative to a baseline of 50 properties in 10 000

Data source: CIE

Businesses

The estimates of average business WTP/WTA for both improvements and degradation in each of the wastewater overflows service attributes are presented in table 6.8.

6.8 Business average WTP and WTA compensation for changes in wastewater overflows

	Service improvement (WTP)	Service degradation (WTA)
	% of annual bill	% of annual bill
Change of 10 in 10 000 properties in the chance each year of a wastewater overflow on your property	0.08% (0.05%, 0.11%)	-0.81% (-1.20%, -0.42%)
Change of 1 in 10 000 properties (from a base of 1 in 10 000 properties per year) in the chance each year of experiencing three wastewater overflows on your property	0.20% (0.09%, 0.30%)	-1.14% (-1.81%, -0.47%)
Change of one hour (from a base of five hours) in the time taken to stop overflow and clean the affected area	0.15% (0.09%, 0.22%)	-1.54% (-2.32%, -0.76%)

Note: 95 per cent confidence intervals in parentheses

Source: CIE

The model of business choice expresses WTP as a proportion of the respondent's bill, so that larger water users have larger WTP. Table 6.9 uses a business customer with a quarterly water and wastewater bill of $300 (i.e. an annual bill of $1200) to provide an example of the dollar amounts that can be derived from the percentage estimates above.

6.9 Business WTP and WTA compensation for changes in wastewater overflows estimated at median bill level

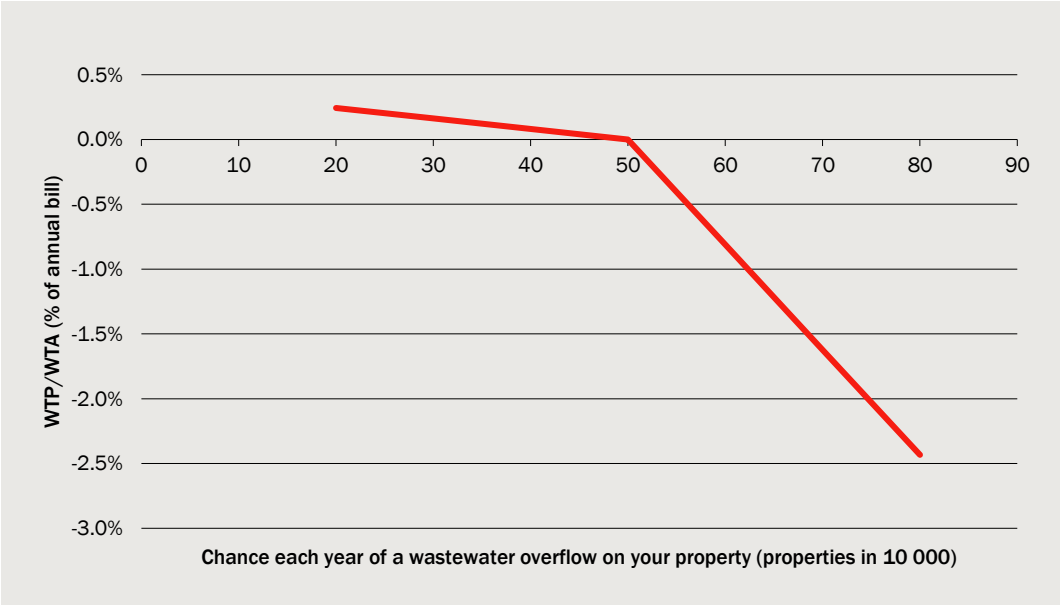
	Service improvement (WTP)	Service degradation (WTA)
	$ per year	$ per year
Change in chance of a wastewater overflow on your property by 10 in 10 000 properties	$0.97 ($0.60, $1.35)	-$9.73 (-$14.43, -$5.04)
Change in chance of experiencing three wastewater overflows on your property each year by 1 in 10 000 properties	$2.34 ($1.07, $3.61)	-$13.70 (-$21.77, -$5.64)
Change in the time taken to stop overflow and clean affected area by one hour	$1.85 ($1.04, $2.66)	-$18.48 (-$27.82, -$9.13)

Note: Estimated at median bill in the sample; 95 per cent confidence intervals in parentheses

Source: CIE

As in the household model, the number of wastewater overflows has linear relationships with business WTP and WTA, allowing interpolation and extrapolation using the figures above (however we would advise against extrapolating beyond the range of levels used in the study). These relationships and the striking asymmetry between WTP and WTA are illustrated in figure 6.10.

6.10 Business average WTP for changes in the chance of overflows relative to a baseline of 50 properties in 10 000



Data source: CIE

Debriefing questions

There is no evidence that the cognitive burden of the survey was perceived by respondents as excessive. Only 7 per cent of respondents indicated the choice questions were very difficult, rather than somewhat difficult or not difficult.

Almost all respondents considered the choices on the basis of the attribute levels shown in the options. Only 4 per cent of respondents assumed that by selecting 'current package' they would get service levels they have experienced in the past, as distinct from the levels described in the question. Only 3 per cent indicated there was at least one question where they assumed they would be getting different service levels or bill impacts to those described in the options.

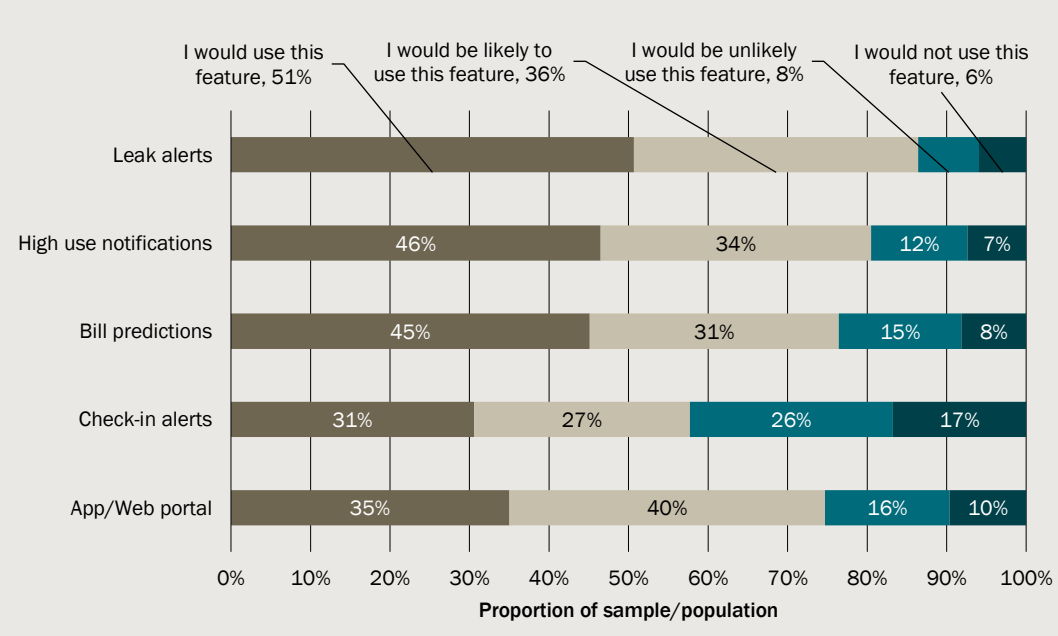
The survey was consequential for most respondents, with 77 per cent indicating they believe it is very likely or somewhat likely the survey will affect Sydney Water decisions.

7 Results – digital meters

Preferences for notification and website features

The survey results indicate that all of the features enabled by digital meters would be highly utilised (see figures 7.1 and 7.2). Businesses would be more likely to use the features than citizens, with over 90 per cent indicating they would or would be likely to use four of the five features, compared to 75-85 per cent for citizens. The least favoured feature was the check-in alerts, which 42 per cent of citizens and 18 per cent of businesses indicated they would not use or would be unlikely to use.

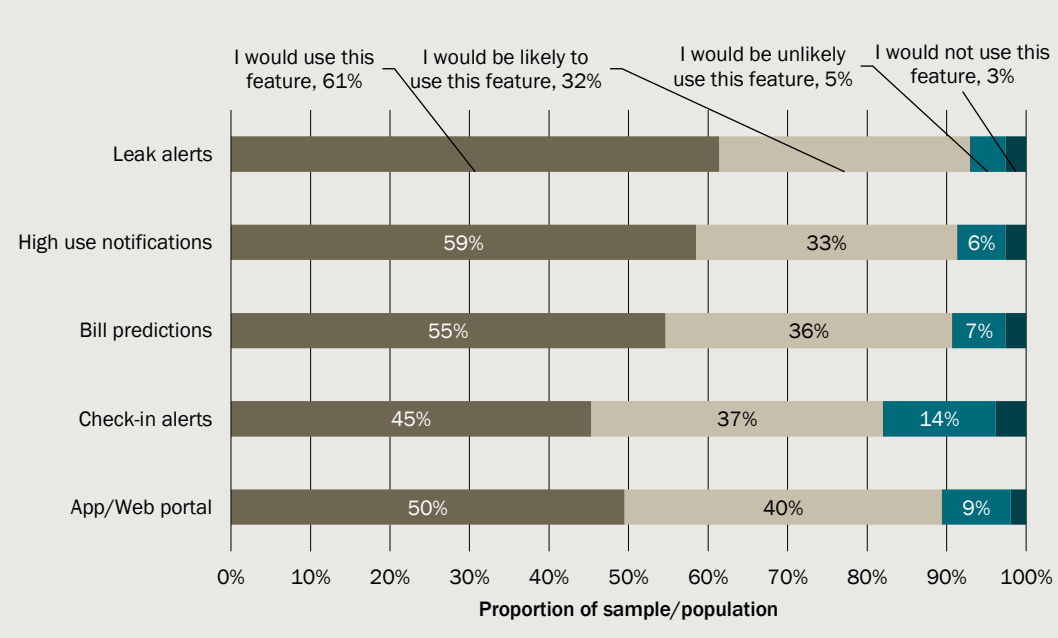
7.1 Citizen preferences for features enabled by digital meters



Note: n=811

Data source: CIE

7.2 Business preferences for features enabled by digital meters



Note: n=311

Data source: CIE

Responses to valuation questions

Households

Citizens responding on behalf of their households clearly gave consideration to the cost at which the digital metering program was offered, with acceptance levels generally decreasing with cost (see table 7.3 and figure 7.4).

It is likely a majority of citizens would support digital meters and associated features at a cost to them of $3 per quarter. At $10 per quarter, the number of respondents indicating they would or probably would vote for a digital metering program is similar to the number of respondents indicating they would not or probably would not vote for a program. A program costing $15 per quarter is unlikely to be supported by citizens.

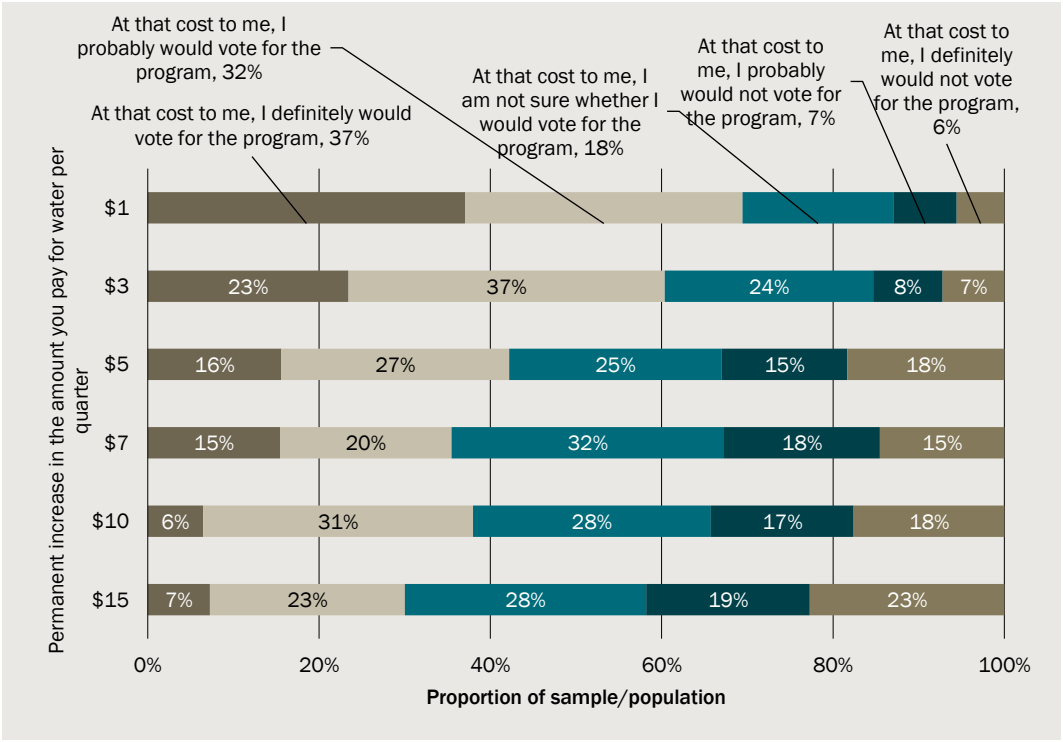
7.3 Citizen responses to digital meters contingent valuation question

	Wave 1		Wave 2				
	Yes	No	At that cost to me, I definitely would vote for the program	At that cost to me, I probably would vote for the program	At that cost to me, I am not sure whether I would vote for the program	At that cost to me, I probably would not vote for the program	At that cost to me, I definitely would not vote for the program
	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.
$1	14	13	40	35	19	8	6
$3	21	4	26	41	27	9	8
$5	16	10	17	29	27	16	20
$7	14	11	17	22	35	20	16
$10	14	13	7	34	30	18	19
$15	6	19	8	25	31	21	25

Note: n=811

Source: CIE

7.4 Citizen responses to digital meters contingent valuation question



Note: n=656 (Wave 2)

Data source: CIE

Parametric approaches are not used to estimate WTP in this study, since the results are highly sensitive to specification and also infer negative WTP for many respondents. However, in the course of estimating probit models we identified several respondent characteristics that are related to WTP. We found citizens were more likely to vote yes if

located in Blacktown, Inner South West, Outer South West, Outer West and Blue Mountains, Parramatta or South West. Citizens were less likely to vote yes if they were a home owner.

Businesses

Businesses were more supportive of digital meters than citizens, with very few businesses indicating they would vote against a digital metering program, even at the highest cost level included in the study of 5 per cent of their water and wastewater bill (see table 7.5 and figure 7.6).

7.5 Business responses to digital meters contingent valuation question

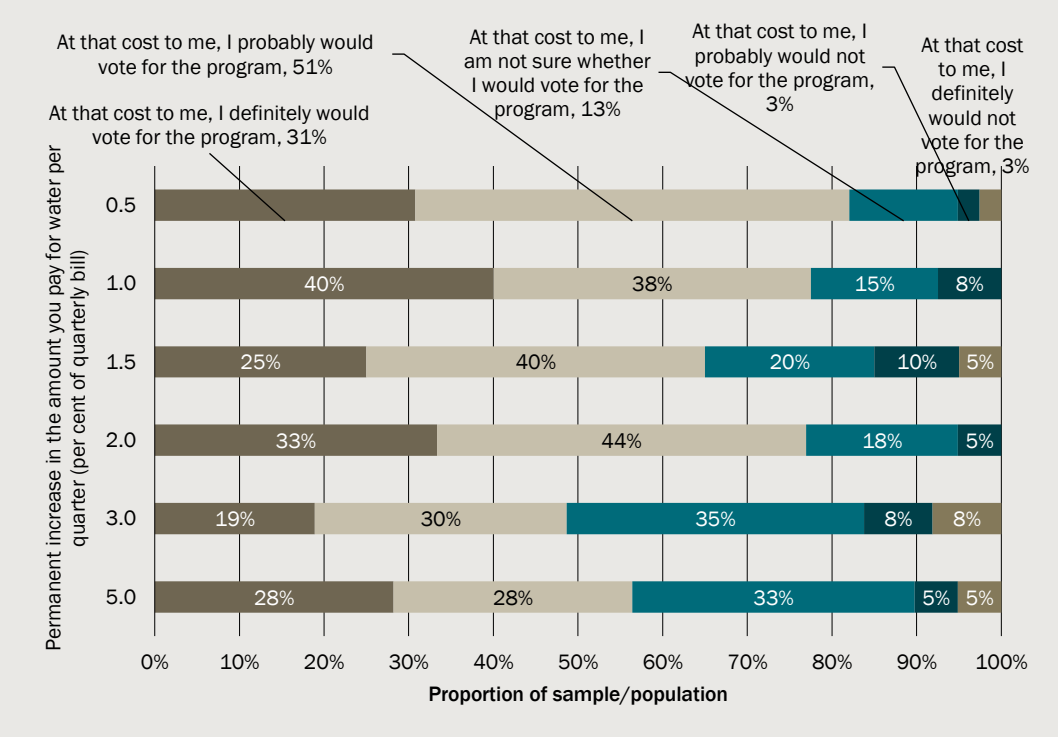
	Wave 1		Wave 2				
	Yes	No	At that cost to me, I definitely would vote for the program	At that cost to me, I probably would vote for the program	At that cost to me, I am not sure whether I would vote for the program	At that cost to me, I probably would not vote for the program	At that cost to me, I definitely would not vote for the program
	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.
0.5%	10	3	12	20	5	1	1
1.0%	10	2	16	15	6	3	0
1.5%	10	2	10	16	8	4	2
2.0%	10	3	13	17	7	2	0
3.0%	8	6	7	11	13	3	3
5.0%	7	6	11	11	13	2	2

Note: n=311

Source: CIE

The probit models estimated on the data did not indicate any statistically significant relationships between business characteristics and WTP.

7.6 Business responses to digital meters contingent valuation question



Note: n=234 (Wave 2)

Data source: CIE

Estimates of average willingness to pay

Households

The lower-bound robust non-parametric Turnbull estimator for mean WTP is $3.02 per household per quarter. This was calculated by treating each 'At that cost to me, I probably would vote for the program' response as a 'no' vote. This is a conservative approach adopted to counter concerns that CV studies tend to overestimate WTP due to hypothetical bias and yea-saying. A less conservative estimate in which the 'probably yes' response is treated as yes vote at the next lowest price level in the price vector (e.g. probably yes at a cost of $15 is treated as definitely yes at a cost of $10) results in a lower-bound estimate of mean WTP of $4.78 per household per quarter.

Businesses

The lower-bound robust non-parametric Turnbull estimators for mean WTP are:

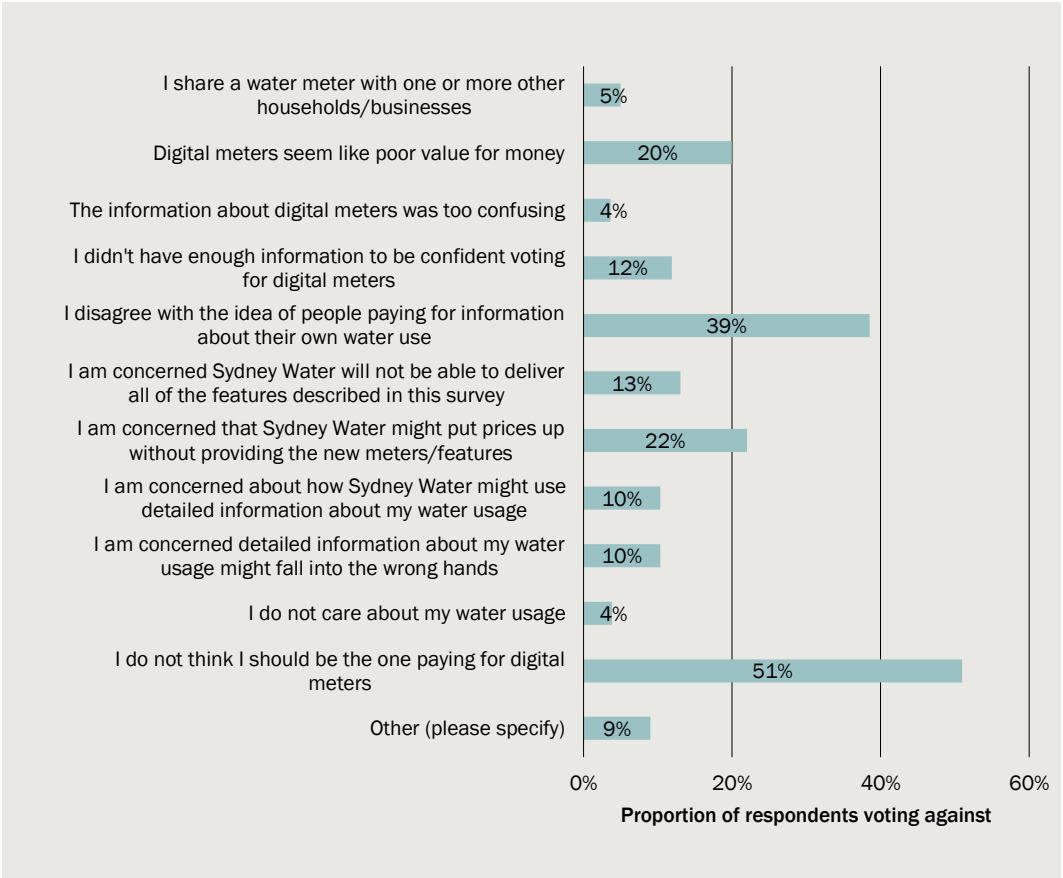
- a permanent increase of 1.12 per cent in business customer bills, if each 'At that cost to me, I probably would vote for the program' response is treated as a 'no' vote. This equates to $3.75 per quarter at the median quarterly bill reported by businesses in this survey of $333.

- a permanent increase of 2.50 per cent on business customer bills if each 'At that cost to me, I probably would vote for the program' response is treated as a 'yes' vote at the next lowest price level in the price vector than the level offered in the question. This equates to $8.31 per quarterly bill at the median bill level reported in the survey.

Debriefing questions

When respondents voted 'no' to a digital metering program, the most common reason given was 'I do not think I should be the one paying for digital meters', followed by 'I disagree with the idea of people paying for information about their water use'. The top four reasons given all relate to the cost to the respondent in some way.

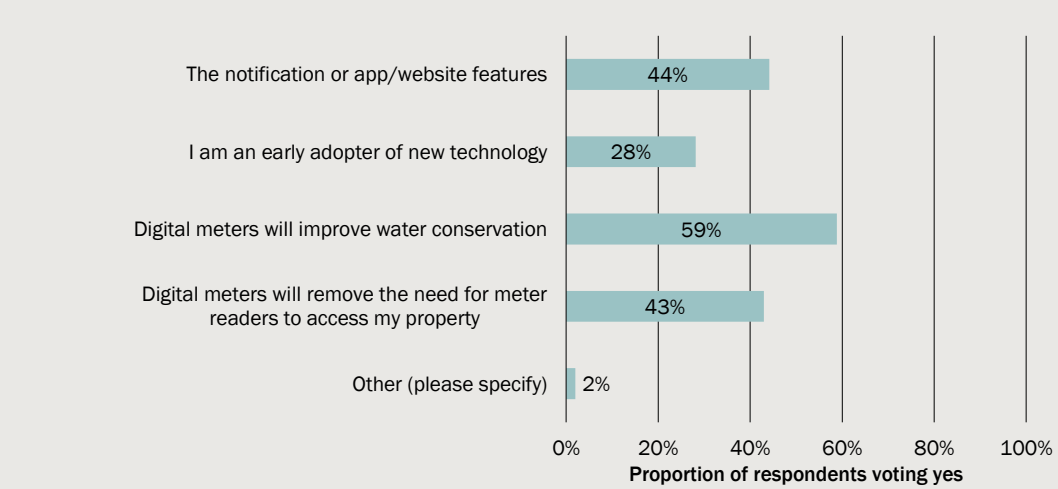
7.7 Reasons given for voting against digital meters



Note: n=522 (respondents voting 'no', 'I am not sure...', 'I probably would not...' or 'I definitely would not...')
Data source: CIE

When respondents voted for the digital metering program, the most common reason given was 'Digital meters will improve water conservation'. This ranked ahead of the information service features and removing the need for meter readers.

7.8 Reasons given for voting for digital meters



Note: n=600 (respondents voting 'yes', 'I definitely would…' or 'I probably would…')

Data source: CIE

Most respondents indicated the survey was consequential, with 33 per cent indicating they believe it is very likely and a further 51 per cent indicating they believe it is somewhat likely that the survey will affect Sydney Water's decisions.

8 Results – ocean wastewater outfalls

Responses to valuation questions

Households

Citizens responding on behalf of their households clearly gave consideration to the cost at which the ocean outfalls project was offered, with acceptance levels generally decreasing with cost (see table 8.1 and figure 8.2).

8.1 Citizen responses to ocean outfalls contingent valuation question

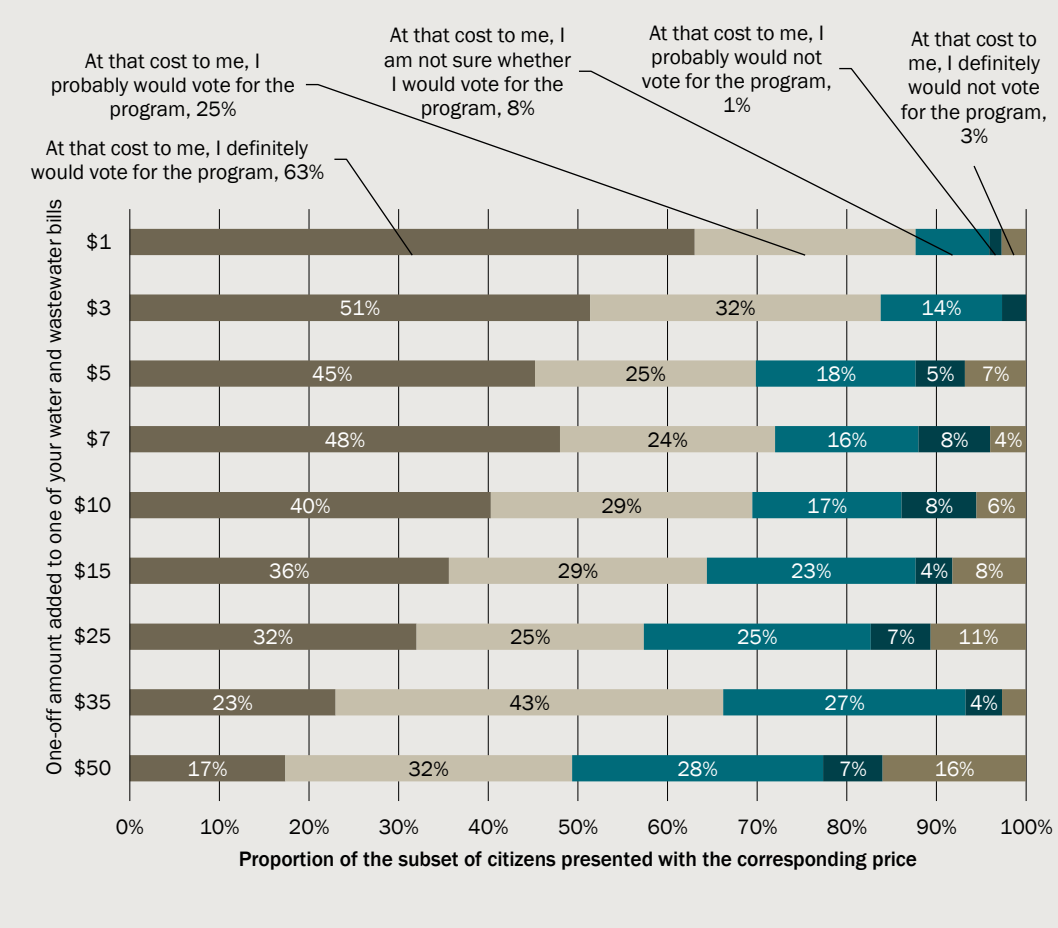
	Wave 1		Wave 2				
	Yes	No	At that cost to me, I definitely would vote for the program	At that cost to me, I probably would vote for the program	At that cost to me, I am not sure whether I would vote for the program	At that cost to me, I probably would not vote for the program	At that cost to me, I definitely would not vote for the program
	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.
$1	16	0	46	18	6	1	2
$3	13	3	38	24	10	2	0
$5	10	6	33	18	13	4	5
$7	12	3	36	18	12	6	3
$10	12	5	29	21	12	6	4
$15	12	5	26	21	17	3	6
$25	11	4	24	19	19	5	8
$35	13	3	17	32	20	3	2
$50	10	5	13	24	21	5	12

Note: n=807

Source: CIE

A majority of citizens indicated definite support for a project to limit the release of raw wastewater at Sydney cliff faces at a one-off cost to them of up to $3. The median response to price levels between $5 and $35 was 'At that cost to me, I probably would vote for the program.'

8.2 Citizen responses to ocean outfalls contingent valuation question



Note: n=664 (Wave 2)

Data source: CIE

Parametric approaches are not used to estimate WTP in this study, since the results are highly sensitive to specification and also infer negative WTP for many respondents. However, in the course of estimating probit models we identified several respondent characteristics that are related to WTP. We found citizens were more likely to vote 'yes' if their household income is greater than $156 000 per year or if located in Inner West, Outer South West, Outer West and Blue Mountains or Parramatta. Citizens were less likely to vote yes if male or with household income below $78 000 per year.

Businesses

Businesses' demand for the project remained strong up to a cost of 15 per cent of a quarterly bill. This was the maximum cost level used in the Wave 1 and Wave 2 fieldwork. The flatness of this demand curve would have caused problems estimating WTP due to the fat tail of the empirical distribution. So, in a third wave of fieldwork, additional responses were collected at two higher cost levels – 25 per cent and 40 per cent of a quarterly bill. Definite support for the project was noticeably lower at these higher cost levels (see table 8.3 and figure 8.4). We also examined business demand using dollar

amounts, rather than proportions of the bill, but there was no clear evidence of a stronger relationship.

8.3 Business responses to ocean outfalls contingent valuation question

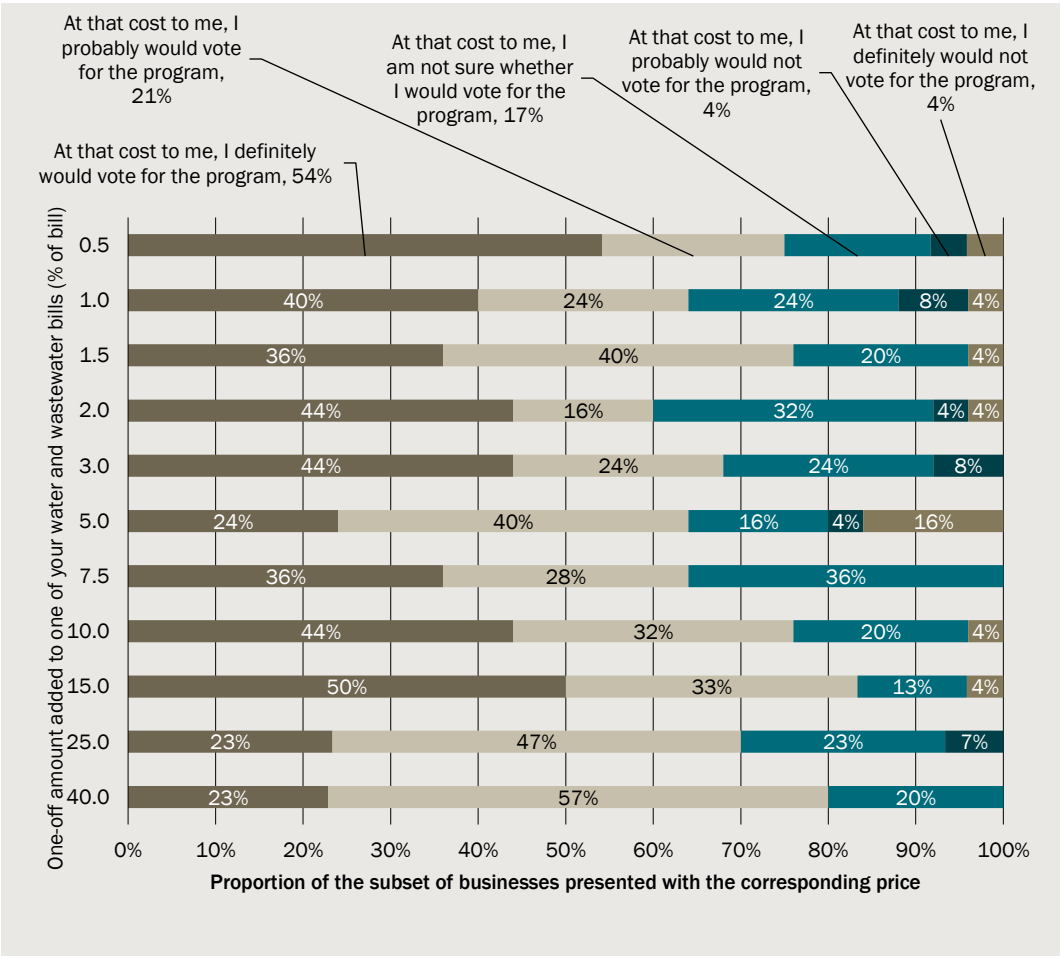
	Wave 1		Wave 2/3				
	Yes	No	At that cost to me, I definitely would vote for the program	At that cost to me, I probably would vote for the program	At that cost to me, I am not sure whether I would vote for the program	At that cost to me, I probably would not vote for the program	At that cost to me, I definitely would not vote for the program
	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.
0.5%	7	2	13	5	4	1	1
1.0%	7	2	10	6	6	2	1
1.5%	7	2	9	10	5	0	1
2.0%	8	1	11	4	8	1	1
3.0%	7	2	11	6	6	2	0
5.0%	9	0	6	10	4	1	4
7.5%	9	0	9	7	9	0	0
10.0%	7	2	11	8	5	0	1
15.0%	7	3	12	8	3	0	1
25.0%	0	0	7	14	7	2	0
40.0%	0	0	8	20	7	0	0

Note: n=370

Source: CIE

A majority of businesses indicated definite support for a project to limit the release of raw wastewater at Sydney cliff faces at a one-off cost to them of 0.5 per cent of one quarterly bill. The median response to all other price levels was 'At that cost to me, I probably would vote for the program.'

8.4 Business responses to ocean outfalls contingent valuation question



Note: n=288 (Wave 2/3)

Data source: CIE

Probit models estimated on the data indicated that businesses were more likely to vote 'yes' if they have 20 or more employees, if they own their business premises, if all/most of their business activity takes place at their business premises, or if they are located in Illawarra, City and Inner South, North Sydney and Hornsby, Northern Beaches or Parramatta. Businesses were less likely to vote 'yes' if they are a sole trader.

Estimates of average willingness to pay

Households

The lower-bound robust non-parametric Turnbull estimator for mean WTP is a one-off payment of $18.32 per household. This was calculated by treating each 'At that cost to me, I probably would vote for the program' response as a 'no' vote. This is a conservative approach adopted to counter concerns that CV studies tend to overestimate WTP due to hypothetical bias and yea-saying. A less conservative estimate in which the 'probably yes' response is treated as 'yes' vote at the next lowest price level in the price vector (e.g.

probably yes at a cost of $15 is treated as definitely yes at a cost of $10) results in a lower-bound estimate of mean WTP of $22.58 per household as a one-off payment.

Businesses

The lower-bound robust non-parametric Turnbull estimators for mean WTP are:

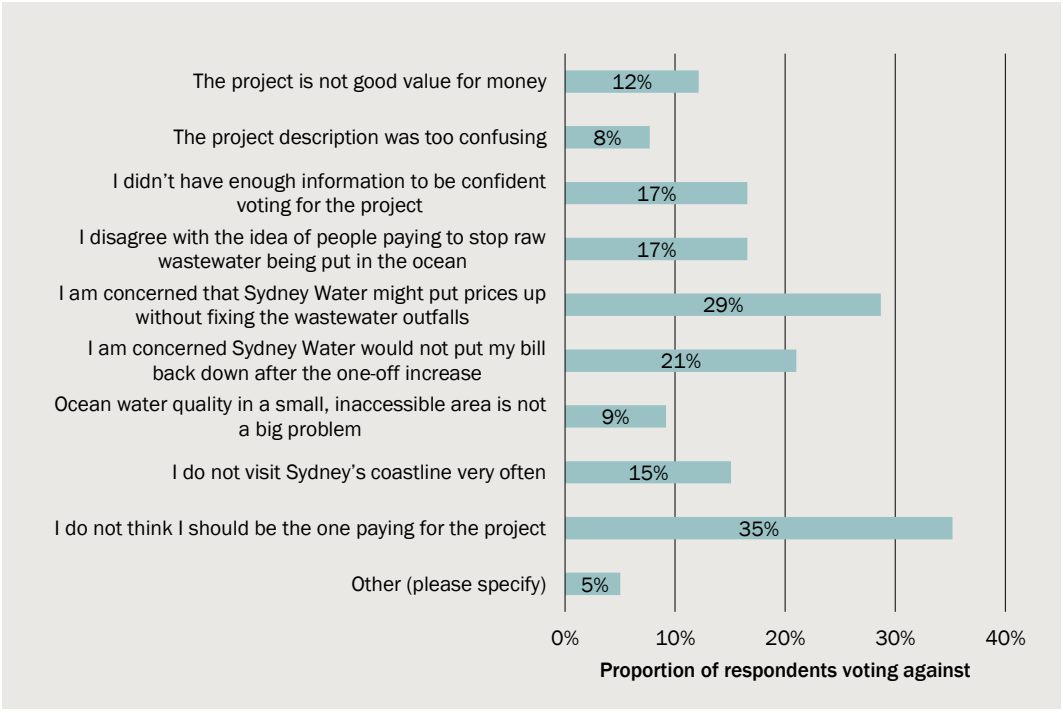
- a one-off payment of 9.6 per cent of a quarterly bill, if each 'At that cost to me, I probably would vote for the program' response is treated as a 'no' vote. This equates to around $29 at the median quarterly bill reported by businesses in this survey of $300.
- a one-off payment of 21.5 per cent of a quarterly bill, if each 'At that cost to me, I probably would vote for the program' response is treated as a 'yes' vote at the next lowest price level in the price vector than the level offered in the question. This equates to around $65 at the median bill level reported in the survey.

Sensitivity analysis should be used when applying these estimates. They have been based on the pooling of several cost categories due to flat parts of the demand curve.

Debriefing questions

The most common reason given for voting against the project was 'I do not think I should be the one paying for the project', followed by 'I am concerned that Sydney Water might put prices up without fixing the wastewater outfalls.'

8.5 Reasons for voting against the ocean outfalls project



Note: n=338 (respondents voting no)

Data source: CIE

Most respondents indicated the survey was consequential, with 32 per cent indicating they believe it is very likely and a further 51 per cent indicating they believe it is somewhat likely that the survey will affect Sydney Water's decisions.

9 Results – water pressure

Responses to valuation questions

Households

Citizens responding on behalf of their households clearly gave consideration to the cost at which the water pressure program was offered, with acceptance levels generally decreasing with cost (see table 9.1 and figure 9.2).

9.1 Citizen responses to water pressure contingent valuation question

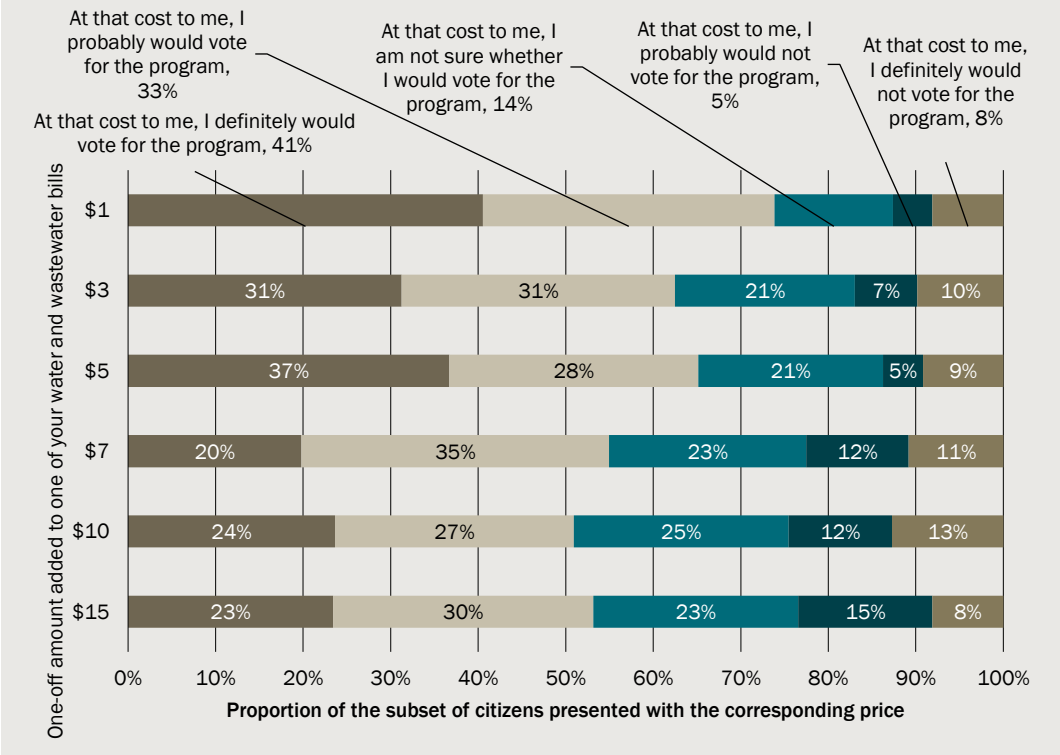
	Wave 1		Wave 2				
	Yes	No	At that cost to me, I definitely would vote for the program	At that cost to me, I probably would vote for the program	At that cost to me, I am not sure whether I would vote for the program	At that cost to me, I probably would not vote for the program	At that cost to me, I definitely would not vote for the program
	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.
$1	21	3	45	37	15	5	9
$3	15	8	35	35	23	8	11
$5	17	8	40	31	23	5	10
$7	15	8	22	39	25	13	12
$10	13	11	26	30	27	13	14
$15	11	13	26	33	26	17	9

Note: n=807

Source: CIE

At all price levels shown in the survey, the median response was 'At that cost to me, I probably would vote for the program.' The proportion of citizens indicating definite support for a program drops from 30-40 per cent when the cost is $1 to $5 down to 20-25 per cent when the cost is $7 to $15.

9.2 Citizen responses to water pressure contingent valuation question



Note: n=664 (Wave 2)

Data source: CIE

Parametric approaches are not used to estimate WTP in this study, since the results are highly sensitive to specification and also infer negative WTP for many respondents. However, in the course of estimating probit models we identified several respondent characteristics that are related to WTP. We found citizens were more likely to vote 'yes' if their household income is greater than $156 000 per year or if located in Illawarra, Eastern Suburbs, Outer West and Blue Mountains, or Parramatta. Citizens were less likely to vote 'yes' if aged 70 years or over.

Businesses

Definite support for a water pressure program declined from around half to around a third of business respondents over the price levels used in the CV exercise, the largest of which was 5 per cent of a quarterly bill (see table 9.3 and figure 9.4).

9.3 Business responses to water pressure contingent valuation question

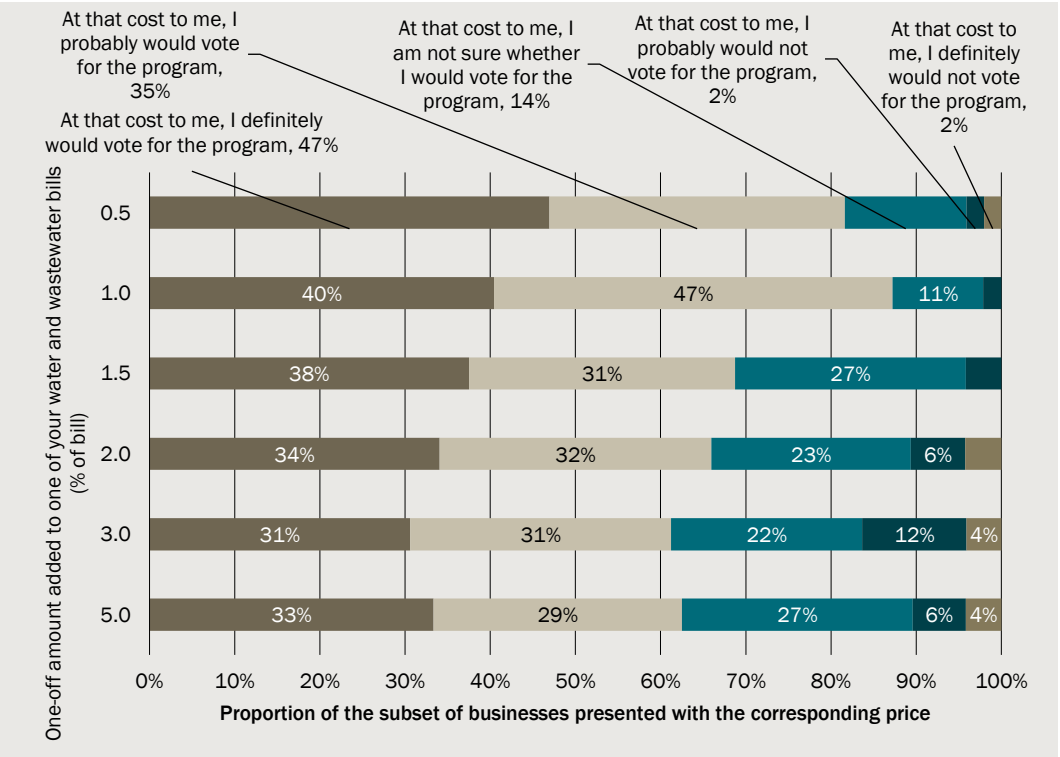
	Wave 1		Wave 2				
	Yes	No	At that cost to me, I definitely would vote for the program	At that cost to me, I probably would vote for the program	At that cost to me, I am not sure whether I would vote for the program	At that cost to me, I probably would not vote for the program	At that cost to me, I definitely would not vote for the program
	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.	No. of resp.
0.5%	12	1	23	17	7	1	1
1.0%	10	4	19	22	5	1	0
1.5%	9	5	18	15	13	2	0
2.0%	9	5	16	15	11	3	2
3.0%	8	5	15	15	11	6	2
5.0%	10	4	16	14	13	3	2

Note: n=370

Source: CIE

Almost half of surveyed businesses would definitely support a water-pressure-improvement program at a one-off cost of 0.5 per cent of a quarterly bill. The median response for all price levels used in the survey (up to 5 per cent of a quarterly bill) was 'At that cost to me, I probably would vote for the program.'

9.4 Business responses to water pressure contingent valuation question



Note: n=288 (Wave 2/3)

Data source: CIE

Probit models estimated on the data indicated that businesses were more likely to vote 'yes' if they have 20 or more employees, if they indicated they would be able to operate their business during a water pressure failure, if they own their business premises, if all/most of their business activity takes place at their business premises, or if they are located in Illawarra.

Estimates of average willingness to pay

Households

The lower-bound robust non-parametric Turnbull estimator for mean WTP is a one-off payment of $4.61 per household. This was calculated by treating each 'At that cost to me, I probably would vote for the program' response as a 'no' vote. This is a very conservative approach adopted to counter concerns that CV studies tend to overestimate WTP due to hypothetical bias and yea-saying. A less conservative estimate in which the 'probably yes' response is treated as yes vote at the next lowest price level in the price vector (e.g. probably yes at a cost of $15 is treated as definitely yes at a cost of $10) results in a lower-bound estimate of mean WTP of $7.23 per household as a one-off payment.

Businesses

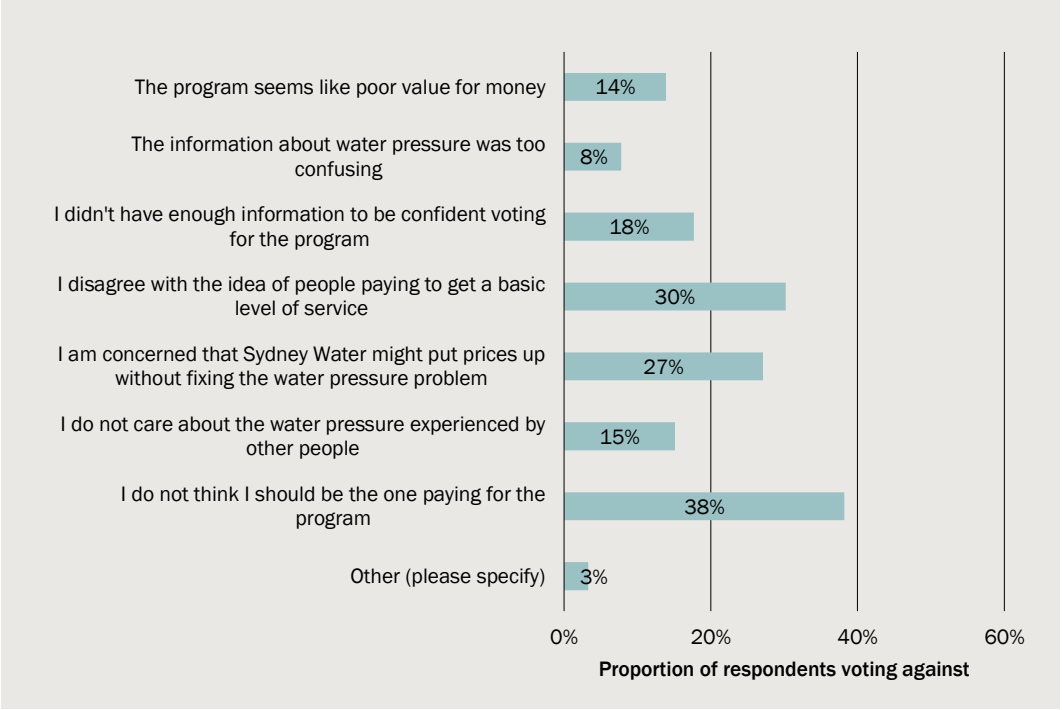
The lower-bound robust non-parametric Turnbull estimators for mean WTP are:

- a one-off payment of 1.34 per cent of a quarterly bill, if each 'At that cost to me, I probably would vote for the program' response is treated as a 'no' vote. This equates to around $4 at the median quarterly bill reported by businesses in this survey of $300.
- a one-off payment of 3.05 per cent of a quarterly bill, if each 'At that cost to me, I probably would vote for the program' response is treated as a 'yes' vote at the next lowest price level in the price vector than the level offered in the question. This equates to around $9 at the median bill level reported in the survey.

Debriefing questions

The most common reason given for voting against the project was 'I do not think I should be the one paying for the program', followed by 'I disagree with the idea of people paying to get a basic level of service' and 'I am concerned that Sydney Water might put prices up without fixing the water pressure problem.'

9.5 Reasons for voting against the water pressure project



Note: n=424 (respondents voting no)

Data source: CIE

Most respondents indicated the survey was consequential, with 32 per cent indicating they believe it is very likely and a further 51 per cent indicating they believe it is somewhat likely that the survey will affect Sydney Water's decisions.

10 Discussion

Applying the results

It is difficult to draw many meaningful conclusions from the results of this research when viewed in isolation, since their primary purpose is as inputs to cost-benefit analysis. When conducting cost-benefit analysis, the estimates should ideally be used to value only changes in service that are within the range presented to respondents in this study (presented in tables 3.2 and 3.3 of this report). Research has shown individuals are risk averse to losses of low probability and that the value placed on changes in risk is non-linear (Tversky and Kahnemann 1992). A linear extrapolation of these results to changes in risk that are outside the range used in the study may overestimate WTP.

Comparison with existing evidence

The results for WTP and WTA compensation for changes in the likelihood of water interruptions and wastewater overflows were of a similar order of magnitude to the estimates found for Icon Water by McNair and Scarpa (2016).

McNair and Scarpa (2016) found households' WTP for a one percentage point decrease in the likelihood of water supply interruptions was $1.85 per year. This lies between the equivalent estimates in the present study for short ($0.56 per year) and long ($2.40 per year) interruptions. The earlier Hensher et al (2005) study in Canberra found household WTP of $11 per year to avoid a water interruption that occurs once every ten years, which converts to $1.10 per year to avoid a one percentage point change in interruption likelihood. This also lies between the estimates for short and long interruptions in the present study, with or without indexation for general price inflation.

McNair and Scarpa (2016) found household WTA for a one percentage point increase in the likelihood of water interruptions to be -$3.49 per year. Again, this lies between the equivalent estimates in the present study for short (-$1.19 per year) and long (-$5.09 per year) interruptions.

In relation to wastewater overflows, Canberra households were willing to pay $16 per year for a one percentage point decrease in likelihood. In the present study, the equivalent estimate would be $8.98 per year, though it should be noted this comparison involves some extrapolation outside the range of levels used in the experimental design, since the maximum decrease in likelihood offered to respondents in the present study was 0.4 of a percentage point. Similarly, the Icon Water WTA figure for a one percentage point increase in likelihood of -$86 per year compares with -$82 per year in the present study, noting that the largest increase shown to respondents was 0.7 of a percentage point. The Hensher et al (2005) study found lower values, since by interpolation we

calculate they estimated WTP of $2.10 per year for a one percentage point change in likelihood of overflows. It should be noted however that the Hensher et al (2005) study did not describe service levels in terms of likelihood but rather the frequency of overflows happening with certainty.

There was a significant difference between the studies' estimates of WTP and WTA compensation for changes in the time taken to stop and clean up after overflows, with estimates in the present study roughly a tenth of those in the Icon Water study. This could be due in part to the higher base likelihood of overflows in Canberra.

Overall, this comparison indicates that the findings of the present study are not outliers in the existing body of evidence and provide confidence in the method, particularly as the results were robust to differences in methods across the two studies relating to the expression of likelihoods and the levels of status quo service.

Phase 1 finding on the trade-off between communication and interruption duration

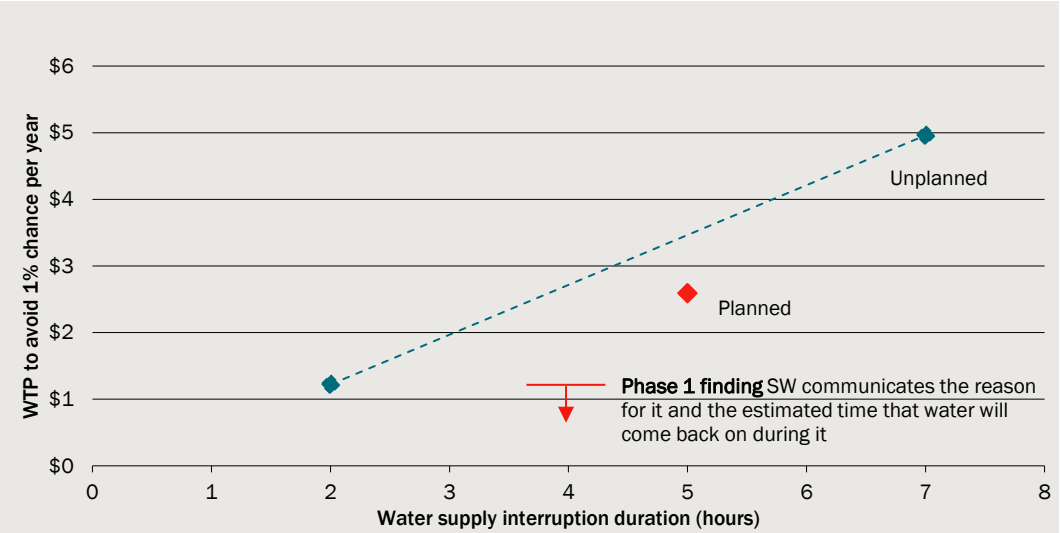
The finding in the present study that planned interruptions lasting 4-6 hours are more inconvenient than unplanned interruptions lasting 1-3 hours may, at first glance, appear to be inconsistent with the finding from CIPA Phase 1 that customers prefer a four-hour interruption with communication to a two-hour interruption without communication. While it is possible that results from forums may differ to those from online surveys, for example because the forum environment tends to elicit more community-minded responses, it is possible that these results are in fact consistent. First, the communication associated with planned interruptions in the WTP survey was a letter sent prior to the interruption. In the forum question, however, the communication was during the interruption:

> 'Which of the following daytime events would you prefer?
>
> A water interruption that lasts for four hours but Sydney Water communicates the reason for it and the estimated time that water will come back on during it.
>
> A water interruption that lasts for two hours but there is no communication from Sydney Water during it.' (emphasis added)

It is possible that communication during an interruption is valued more highly than communication prior to an interruption. Sydney Water may wish to test this in future research.

Second, the duration of the interruption with communication in the forum question was four hours, whereas the duration of the planned interruptions in the WTP survey was defined as 4-6 hours. Figure 10.1 illustrates that the planned interruption value from the online survey and the value for the four-hour interruption with communication implied by the forum finding could plausibly lie on the same preference function, depending on the functional form and, in particular, the marginal value placed on duration between four and five hours.

10.1 Comparison with Phase 1 finding on the trade-off between communication and duration



Data source: CIE

Difference between willingness to pay and willingness to accept

Similar to the McNair and Scarpa (2016) study discussed above, a notable feature of the present study, particularly the wastewater component, is the significant difference between estimates of WTA compensation for degradation in service and estimates of WTP for an equivalent improvement in service. This difference should not be considered a weakness in the survey technique. It is a recognised phenomenon in consumer psychology (Kahnemann and Tversky 1991) and past research in economics has found that differences between WTP and WTA can be explained by:

- WTA being unconstrained by income; and
- substitutes being very costly, which they are in the case of water and wastewater network services (Hanemann 1991).

We also note it is consistent with qualitative evidence derived from other customer engagement in the water sector. For example, Yarra Valley Water found 'Our research shows that most customers are not willing to see any increase in bills to further improve levels of service …At the same time, they've said that they value increased service levels over a bill decrease.' (Yarra Valley Water 2017, pp. 9,12)

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A Expert peer review

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26th, September, 2018

Peer Review of Willingness to Pay Research Project

To whom it may concern,

I write to communicate my involvement as an expert of the Institute of Business Research of the Waikato Management School in the peer review of the study undertaken by the Centre for International Economics in relation to households' and businesses' willingness to pay (WTP) for changes in the water and wastewater services provided to the population of Sydney Water's customers. I engaged in consultation and dialogue with Dr. Benjamin McNair from the beginning of this endeavour and at several stages of advancement in the conduction of this study. In particular, I reviewed the technical details of all of the experimental designs for the stated choice surveys and the bid design for the contingent valuation surveys. I found the resulting designs employed in each survey to be well grounded in the theory and current practice of experimental design for stated choice data collection.

I was also involved in evaluating the various model estimation procedures. In that context I was able to independently replicate the initial models from which, after an adequate specification search, the more final selected models used to obtain WTP estimates described in the report were obtained. I reviewed the congruence of the interpretation of the statistical model results for policy recommendation and found it robust and coherent with my understanding of these models.

With the information in my possession I am satisfied that the report fully meets the state of practice in commercial consultancy environments in non market valuation studies via stated choice data of regulated public utility customers. In fact, the techniques used in this study go beyond commonly established practice and include approaches at the forefront of the discipline, which many, including myself, would consider state of the art. One such example is the important identification of gain-loss asymmetry. Overall I am very satisfied with the quality of the report and the supporting data analysis and specification search, which in my opinion made an excellent use of the resources made available for the study.

Sincerely yours,

Riccardo Scarpa

B Questionnaire – water interruptions

Project	Sydney Water CIPA
Engagement	Water interruptions
Sample	Citizens n=800 and businesses n=300

Welcome…

Thank you for participating in this survey, which is being run by Pureprofile and the Centre for International Economics on behalf of Sydney Water.

As part of Sydney Water's focus on putting customers at the heart of everything we do, we are asking our customers to provide their views on water interruptions. Your input is very important and will affect the way we work on our water pipes.

This questionnaire will take around 15-20 minutes to complete.

We wish to reassure you that this is genuine market research and as always your individual survey responses will remain confidential and anonymous at all times.

In the unlikely event of any technical difficulties please click on the technical support e-mail link.

For other enquiries, please contact Sydney Water on 1800 627 687.

Please Keep In Mind…

Do not use your Back or Forward browser buttons while you are taking this survey. Once you answer a question, you will not be able to go back and change your answer.

Before we go through to the main study we would like to ask you a number of questions to make sure we are interviewing a good cross section of people.

1. Are you:

   Please select one.

   a. A business owner or sole trader with a commercial premises **GO TO BUSINESS VERSION**

   b. Responsible for managing business operations at a commercial premises **GO TO BUSINESS VERSION**

   c. None of the above **GO TO CITIZEN VERSION**

CITIZEN ONLY

Please fill out this questionnaire on behalf of your household.

BUSINESS ONLY

Please fill out this questionnaire on behalf of your business.

CITIZEN ONLY

2. Do you or anyone in your household work for any of the following industries/organisations?

Water supply or wastewater services

Market research

IPART (Independent Pricing and Regulatory Tribunal)

NSW Health in a role related to water quality regulation

NSW Environment Protection Authority

a. Yes **TERMINATE**

b. No

BUSINESS ONLY

3. Does your business operate in the water and wastewater service or market research industries?

a. Yes **TERMINATE**

b. No

TERMINATE PAGE

Thank you for your patience in answering these questions. Unfortunately, we do not need you to participate in our research this time, but we sincerely appreciate your time and assistance today.

To keep up to date with opportunities to be involved in ongoing research and consultation, visit https://www.sydneywatertalk.com.au/

CITIZEN ONLY

4. How does your household get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

BUSINESS ONLY

5. How does your business get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

CITIZEN ONLY

Please give a rough estimate of the amount you pay for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small household, with no garden, using 25 kL each quarter, would pay $224
- a typical household, using 50 kL each quarter, would pay $276
- a large household or a household with a garden, using 75 kL each quarter, would pay $328

6. The amount I pay for water and wastewater services each quarter is about:

_____

BUSINESS ONLY

Please give a rough estimate of the amount your business pays for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small business, using a similar amount to a residential property (50 kL each quarter), would pay around $280 per quarter
- a business with slightly larger (25mm) pipes connecting to our network, using three times more water than a typical residential property, would pay around $670 per quarter
- businesses with larger pipes and higher water usage would pay higher amounts.

7. The amount my business pays for water and wastewater services each quarter is about:

_____

CITIZEN ONLY

8. What is the postcode of your home address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

BUSINESS ONLY

9. What is the postcode of your business address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

CITIZEN ONLY

10. Are you… **CHECK QUOTAS**

    a. Male
    b. Female
    c. Non-gender-specific
    d. Prefer not to say

CITIZEN ONLY

11. What is your age? **CHECK QUOTAS**

    a. Less than 18 years **TERMINATE**
    b. 18-29 years
    c. 30-39 years
    d. 40-49 years
    e. 50-59 years
    f. 60-69 years
    g. 70-79 years
    h. 80 years or more

BUSINESS ONLY

12. How many employees do you have in your business (full time equivalents other than the proprietor)? **CHECK QUOTAS**

    a. Non-employing / sole trader
    b. 1-4 employees
    c. 5-19 employees
    d. 20-199 employees
    e. 200 employees or more **TERMINATE**

BUSINESS ONLY

13. In which industry does your business mainly operate? **CHECK QUOTAS**

    a. Accommodation and Food Services
    b. Administrative and Support Services
    c. Agriculture, Forestry and Fishing
    d. Arts and Recreation Services
    e. Construction
    f. Currently Unknown
    g. Education and Training
    h. Electricity, Gas, Water and Waste Services
    i. Financial and Insurance Services

j. Health Care and Social Assistance
k. Information Media and Telecommunications
l. Manufacturing
m. Mining
n. Other Services
o. Professional, Scientific and Technical Services
p. Public Administration and Safety
q. Rental, Hiring and Real Estate Services
r. Retail Trade
s. Transport, Postal and Warehousing
t. Wholesale Trade

This questionnaire is about water supply interruptions.

It has three parts:

- Background information on the types of water supply interruptions that can occur and how they might affect you
- Questions about how you think Sydney Water should balance its spending with the risk of water supply interruptions
- Questions about you

Sometimes, Sydney Water will need to turn off your mains water supply to fix water pipes in your area.

CITIZEN ONLY

While the water supply is turned off, you won't be able to get water from the taps on your property. For example, you will not be able to:

- pour a glass of drinking water;
- flush the toilet (after it's been flushed once);
- rinse or wash dishes or clothes; or
- have a shower.

BUSINESS ONLY

While the water supply is turned off, you won't be able to get water from the taps on your property. This will affect businesses in different ways. For example, it may mean that your staff and customers will be unable to pour a glass of drinking water or flush toilets for the duration of the interruption.

Please take a moment to consider how a water supply interruption might affect the operation of your business.

Sometimes, Sydney Water will give you warning about a water interruption by sending you a letter beforehand.

On other occasions, the work will be urgent and Sydney Water will not be able to warn you about an interruption.

Interruptions with warning typically happen after 9am in residential areas and after 11pm in business areas. Interruptions that occur without warning could happen at any time of day or night.

During a water interruption, there could be noise from trucks and workers on your street.

Traffic could be blocked or slowed to allow these trucks and workers to fix the broken water pipes. Your travel time could be affected even when interruptions happen in areas away from your property.

Sydney Water reduces the risk of unexpected interruptions by doing things like:

- installing pressure-reducing valves in the water pipes
- replacing ageing pipes.

These activities come at a cost that needs to be recovered in Sydney Water bills paid by you and other customers. We want to know your views on how we should balance this cost with the risk of water supply interruptions.

You will now be asked about hypothetical service scenarios.

An example of the type of question you will be asked is set out below. In each question, three water service packages will be described by the chances of different types of water interruptions happening and the impact on the amount you pay for water.

You will be asked to choose your preferred package by ticking one box in the bottom row.

			Current Package	Package A	Package B
Supply interruptions without warning					
Short unplanned interruptions	Chance each year of an interruption lasting 1-3 hours		120 properties in 1000	180 properties in 1000	60 properties in 1000
Long unplanned interruptions	Chance each year of an interruption lasting 6-8 hours		16 properties in 1000	24 properties in 1000	8 properties in 1000
Repeat unplanned interruptions	Chance of experiencing three interruptions in a year		3 properties in 1000	10 properties in 1000	1 properties in 1000
Supply interruptions with written notice					
Planned interruptions	Chance each year of a planned interruption lasting 4-6 hours		20 properties in 1000	30 properties in 1000	10 properties in 1000
The cost to you					
Cost	The permanent change in the amount you pay for water each year	$	No change	You save $X	You pay an extra $Y
Your choice					
If these were the only three options available to you, which option would you choose?			○	○	○

EXAMPLE ONLY

The chance of interruptions happening is expressed as the number of properties in every 1000 experiencing an interruption each year. On average, there are roughly 3000 properties in a suburb. So, 1000 properties is around one third of a suburb.

Under the 'current package' in this example, short unplanned interruptions would happen to 120 properties in 1000 each year. This means a 12 per cent chance there would be an interruption for your property.

Some of the packages may look strange. That is because there are a range of repair and replacement activities Sydney Water could undertake to deliver different outcomes.

		Current Package	Package A	Package B
Supply interruptions without warning				
Short unplanned interruptions	Chance each year of an interruption lasting 1-3 hours	120 properties in 1000	180 properties in 1000	60 properties in 1000
Long unplanned interruptions	Chance each year of an interruption lasting 6-8 hours	16 properties in 1000	24 properties in 1000	8 properties in 1000
Repeat unplanned interruptions	Chance of experiencing three interruptions in a year	3 properties in 1000	10 properties in 1000	1 properties in 1000
Supply interruptions with written notice				
Planned interruptions	Chance each year of a planned interruption lasting 4-6 hours	20 properties in 1000	30 properties in 1000	10 properties in 1000
The cost to you				
Cost	The permanent change in the amount you pay for water each year	No change	You save $X	You pay an extra $Y
Your choice				
If these were the only three options available to you, which option would you choose?		○	○	○

EXAMPLE ONLY

Answering questions about hypothetical situations

Research has shown that people tend to respond differently to hypothetical situations than they would in real life situations. This is most likely because they don't actually have to follow through with their choices in hypothetical situations. Although the situations presented in this survey are hypothetical, your responses will influence decisions about the management of the water system in Sydney, the Blue Mountains and the Illawarra, which will affect the number of water supply interruptions that happen and also the amount you pay for water. Therefore, please answer the questions as if you were really facing these decisions.

14. <choice question 1>

15. <choice question 2> RANDOMISE QUESTION ORDER AND LABEL CHOICE QUESTION 2 WITH PACKAGE C AND PACKAGE D, ETC.

16. <choice question 3>

17. <choice question 4>

18. <choice question 5>

19. <choice question 6>

Now a few questions about how you answered the choice questions.

20. Did you find the choice questions difficult to answer in the time you had available?
    a. They were very difficult questions
    b. They were somewhat difficult questions
    c. They were not difficult questions

21. Was the "current package" shown in each choice question similar to the level of service you currently get?
    a. Yes **SKIP TO Q23**
    b. No
    c. Don't know **SKIP TO Q23**

22. How did you go about answering the questions given you found the "current package" to be different to your experience?
    a. I assumed that by selecting "current package" I would be getting the service levels described in the question
    b. I assumed that by selecting "current package" I would be getting the service levels I have experienced in the past

23. Did you believe that Sydney Water would be able to deliver any of the packages presented?
    a. Yes **SKIP TO Q25**
    b. No
    c. Don't know **SKIP TO Q25**

24. When you saw packages that you did not believe Sydney Water could deliver, how did you go about answering the question(s)?

    a. I answered the question(s) as though I would be getting the service levels and bill impacts described in the packages

    b. I answered the question(s) as though I would be getting different service levels or bill impacts to those described in the packages

IF SELECTED AN OPTION OTHER THAN 'CURRENT PACKAGE' IN AT LEAST ONE CHOICE QUESTION, SKIP Q25 AND GO TO Q26 (IN OTHER WORDS, Q25 IS ONLY FOR RESPONDENTS WHO CHOSE 'CURRENT PACKAGE' IN ALL SIX CHOICE QUESTIONS)

25. Why did you select the current package in every choice question? (tick as many as apply)

    a. I didn't have enough time to properly consider the options

    b. I didn't have enough information to be confident choosing the other options

    c. I disagree with the idea of people paying to avoid water supply interruptions

    d. I disagree with the idea of offering people money to face more water supply interruptions

    e. I'm concerned that Sydney Water might put prices up without making the service improvements

    f. I'm concerned that Sydney Water might let service get worse without reducing prices

    g. Other _____

26. Earlier in the survey we told you that your responses will affect the number of water supply interruptions that happen and also the amount you pay for water. To what degree do you expect the results of this survey will affect decisions made by Sydney Water?

    a. I believe it is very likely the survey will affect Sydney Water's decisions

    b. I believe it is somewhat likely the survey will affect Sydney Water's decisions

    c. I don't think the survey will affect any of Sydney Water's decisions

CITIZEN ONLY

27. How many water supply interruptions can you recall experiencing at home?

_____ interruptions in

_____ years.

BUSINESS ONLY

28. How many water supply interruptions can you recall experiencing at your business?

_____ interruptions in

_____ years.

CITIZEN ONLY

29. How many water supply interruptions can you recall experiencing away from home (e.g. at work)?

_____ interruptions in

_____ years.

BUSINESS ONLY

30. How many water supply interruptions can you recall experiencing away from your business (e.g. at home)?

_____ interruptions in

_____ years.

SKIP Q31 IF:

CITIZEN ANSWERS TO BOTH Q27 AND Q29 WERE ZERO

BUSINESS ANSWERS TO BOTH Q28 AND Q30 WERE ZERO

31. When was the most recent water interruption you experienced?

    a. In the past 6 months

    b. 6-12 months ago

    c. 1-2 years ago

    d. 3-5 years ago

e. More than 5 years ago

32. Approximately how many different water interruptions have you come to know about talking to your friends, relatives, colleagues or neighbours?

_____

33. How many times have you been caught in traffic that was clearly caused by a burst water main or work being done on water pipes?

a. Several times

b. Once or twice

c. Never, as far as I know

CITIZEN ONLY

34. How often do you have someone at home during business hours on weekdays?

a. Never / very rarely

b. Some of the time

c. Very often / all of the time

d. Prefer not to say

35. Is the place you live in:

a. Owned outright or with a mortgage

b. Being rented or occupied rent-free

c. Other (please specify) _____

36. Do you speak a language other than English at home?

a. No, English only **SKIP TO Q38**

b. Yes

37. What is the main language spoken at home?

a. Arabic

b. Australian Indigenous Languages

c. Cantonese

d. Croatian

e. Dutch

f. French

g. German
h. Greek
i. Hindi
j. Indonesian
k. Italian
l. Japanese
m. Korean
n. Lebanese
o. Macedonian
p. Mandarin
q. Polish
r. Punjabi
s. Serbian
t. Spanish
u. Tagalog
v. Turkish
w. Vietnamese
x. Other (please specify) _____
y. Prefer not to say

38. Are you of Aboriginal or Torres Strait Islander origin?

a. Yes
b. No
c. Prefer not to say

39. Which best describes your household:

a. Couple/family without children at home
b. Couple/family with children at home
c. One parent family
d. Group household
e. Single person household
f. Other

40. What is your work status?

a. Working full time
b. Working part time/casually
c. Student
d. Not currently employed
e. Home duties
f. Retired
g. Other

41. What is your approximate annual household income before tax?

a. Less than $41,600
b. Between $41,600 and $78,000
c. Between $78,000 and $104,000
d. Between $104,000 and $156,000
e. More than $156,000
f. Do not wish to answer

42. In what type of dwelling do you live?

a. Separate house
b. Semi-detached, row or terrace house, townhouse
c. Flat or apartment
d. Other

BUSINESS ONLY

43. Can you continue to operate your business without water supply from Sydney Water?

a. Yes
b. No, my business would need to stop operation without water supply
c. My business would need to stop operation if the water supply was off for a period of more than (please specify) _____

44. Do you have clients/customers at your business premises?

a. Never / very rarely
b. Some of the time
c. Very often / all of the time

d. Prefer not to say

45. How much of your business activity takes place at your business premises?

a. All/most of our business activity
b. Some of our business activity
c. Little/none of our business activity

46. How often does your business operate after 11pm?

a. Never / very rarely
b. Some of the time
c. Very often / all of the time
d. Prefer not to say

47. Is your place of business:

a. Owned outright or with a mortgage
b. Being rented or occupied rent-free
c. Other (please specify) _____

48. For how many years has your business been operating?

a. Less than 1 year
b. 1-2 years
c. 2-5 years
d. 6-10 years
e. More than 10 years

49. Are you…

a. Male
b. Female
c. Non-gender-specific
d. Prefer not to say

50. What is your age?

a. Less than 18 years
b. 18-29 years
c. 30-39 years
d. 40-49 years
e. 50-59 years

f. 60-69 years

g. 70-79 years

h. 80 years or more

51. What is your position or title within your business?

a. Owner / proprietor

b. Senior management

c. Other employee

52. Finally, is there any feedback you would like to provide on this survey?

_____
_____
_____
_____

Thank you for participating in this survey. Your opinions are very important.

C Questionnaire – wastewater overflows

Project	Sydney Water CIPA
Engagement	Wastewater overflows
Sample	Citizens n=800 and businesses n=300

Welcome…

Thank you for participating in this survey, which is being run by Pureprofile and the Centre for International Economics on behalf of Sydney Water.

As part of Sydney Water's focus on putting customers at the heart of everything we do, we are asking our customers to provide their views on wastewater overflows. Your input is very important and will affect the way we work on our wastewater pipes.

This questionnaire will take around 15-20 minutes to complete.

We wish to reassure you that this is genuine market research and as always your individual survey responses will remain confidential and anonymous at all times.

In the unlikely event of any technical difficulties please click on the technical support e-mail link.

For other enquiries, please contact Sydney Water on 1800 627 687.

Please Keep In Mind…

Do not use your Back or Forward browser buttons while you are taking this survey. Once you answer a question, you will not be able to go back and change your answer.

Before we go through to the main study we would like to ask you a number of questions to make sure we are interviewing a good cross section of people.

1. Are you:

   Please select one.

   a. A business owner or sole trader with a commercial premises **GO TO BUSINESS VERSION**

   b. Responsible for managing business operations at a commercial premises **GO TO BUSINESS VERSION**

   c. None of the above **GO TO CITIZEN VERSION**

CITIZEN ONLY

Please fill out this questionnaire on behalf of your household.

BUSINESS ONLY

Please fill out this questionnaire on behalf of your business.

CITIZEN ONLY

2. Do you or anyone in your household work for any of the following industries/organisations?

Water supply or wastewater services

Market research

IPART (Independent Pricing and Regulatory Tribunal)

NSW Health in a role related to water quality regulation

NSW Environment Protection Authority

a. Yes **TERMINATE**

b. No

BUSINESS ONLY

3. Does your business operate in the water and wastewater service or market research industries?

a. Yes **TERMINATE**

b. No

TERMINATE PAGE

Thank you for your patience in answering these questions. Unfortunately, we do not need you to participate in our research this time, but we sincerely appreciate your time and assistance today.

To keep up to date with opportunities to be involved in ongoing research and consultation, visit https://www.sydneywatertalk.com.au/

CITIZEN ONLY

4. How does your household get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

BUSINESS ONLY

5. How does your business get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

CITIZEN ONLY

Please give a rough estimate of the amount you pay for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small household, with no garden, using 25 kL each quarter, would pay $224
- a typical household, using 50 kL each quarter, would pay $276
- a large household or a household with a garden, using 75 kL each quarter, would pay $328

6. The amount I pay for water and wastewater services each quarter is about:

_____

BUSINESS ONLY

Please give a rough estimate of the amount your business pays for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small business, using a similar amount to a residential property (50 kL each quarter), would pay around $280 per quarter
- a business with slightly larger (25mm) pipes connecting to our network, using three times more water than a typical residential property, would pay around $670 per quarter
- businesses with larger pipes and higher water usage would pay higher amounts.

7. The amount my business pays for water and wastewater services each quarter is about:

_____

CITIZEN ONLY

8. What is the postcode of your home address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

BUSINESS ONLY

9. What is the postcode of your business address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

CITIZEN ONLY

10. Are you… **CHECK QUOTAS**

    a. Male
    b. Female
    c. Non-gender-specific
    d. Prefer not to say

CITIZEN ONLY

11. What is your age? CHECK QUOTAS

a. Less than 18 years TERMINATE
b. 18-29 years
c. 30-39 years
d. 40-49 years
e. 50-59 years
f. 60-69 years
g. 70-79 years
h. 80 years or more

BUSINESS ONLY

12. How many employees do you have in your business (full time equivalents other than the proprietor)? CHECK QUOTAS

a. Non-employing / sole trader
b. 1-4 employees
c. 5-19 employees
d. 20-199 employees
e. 200 employees or more TERMINATE

BUSINESS ONLY

13. In which industry does your business mainly operate? CHECK QUOTAS

a. Accommodation and Food Services
b. Administrative and Support Services
c. Agriculture, Forestry and Fishing
d. Arts and Recreation Services
e. Construction
f. Currently Unknown
g. Education and Training
h. Electricity, Gas, Water and Waste Services
i. Financial and Insurance Services
j. Health Care and Social Assistance

k. Information Media and Telecommunications
l. Manufacturing
m. Mining
n. Other Services
o. Professional, Scientific and Technical Services
p. Public Administration and Safety
q. Rental, Hiring and Real Estate Services
r. Retail Trade
s. Transport, Postal and Warehousing
t. Wholesale Trade

This questionnaire is about wastewater overflows.

It has three parts:

- Background information on the types of wastewater overflows that can occur and how they might affect you
- Questions about how you think Sydney Water should balance its spending with the risk of wastewater overflows
- Questions about you

Wastewater is the used water that goes down sinks, toilets and drains. When the wastewater system becomes blocked, for example due to tree roots, wastewater can overflow from the manholes that are used to access the sewerage pipes or from a grate in your yard.

In rare cases (about 1 in 200), wastewater may overflow within a building, for example from the shower drain.

Wastewater is mostly water, but it can contain viruses, bacteria and other organisms that are harmful to humans, animals and the environment. In the event of an overflow you would need to stop using your toilets, sinks and other drains and keep away from the affected area until the blockage has been cleared and the area has been thoroughly cleaned by Sydney Water staff.

Wastewater overflows can happen at any time of day. It typically takes about five hours before Sydney Water has unblocked the pipe and cleaned the affected area.

There may be some noise from trucks and workers on your street while this is happening.

Traffic could be blocked or slowed to allow these trucks and workers to work on the pipes. Your travel time could be affected even when overflows happen in areas away from your property.

Sydney Water reduces the risk of these overflows by doing things like:

- putting cameras down pipes to monitor their condition;
- replacement of ageing pipes; and
- cleaning pipes.

These activities come at a cost that needs to be recovered in Sydney Water bills paid by you and other customers. We want to know your views on how we should balance this cost with the risk of wastewater overflows.

You will now be asked six questions about hypothetical service scenarios.

An example of the type of question you will be asked is set out below. In each question, three wastewater service packages will be described by the chance of overflows happening, the time taken to clean them up and the impact on the amount you pay for water.

You will be asked to identify your preferred package by ticking one box in the bottom row.

	Current Package	Package A	Package B
Your service level			
Chance of a wastewater overflow on your property each year	50 properties in 10,000	120 properties in 10,000	10 properties in 10,000
Chance of three wastewater overflows on your property each year	1 property in 10,000	Almost never	1 property in 10,000
Time taken to stop overflow and clean affected area	5 hours	7 hours	3 hours
The cost to you			
The permanent change in the amount you pay for wastewater services each year	No change	You save $X	You pay an extra $Y
Your choice			
If these were the only three options available to you, which option would you choose?	○	○	○

EXAMPLE ONLY

The chance of interruptions happening is expressed as the number of properties in every 10,000 experiencing an overflow each year. On average, there are roughly 3000 properties in a suburb. So, 10,000 properties is around three suburbs.

Under the 'current package' in this example, overflows would happen to 50 properties in 10,000 each year. This means a 0.5 per cent chance there would be an overflow on your property.

Some of the packages may look strange. That is because there are a range of cleaning, repair and replacement activities Sydney Water could undertake to deliver different outcomes.

	Current Package	Package A	Package B
Your service level			
Chance of a wastewater overflow on your property each year	50 properties in 10,000	120 properties in 10,000	10 properties in 10,000
Chance of three wastewater overflows on your property each year	1 property in 10,000	Almost never	1 property in 10,000
Time taken to stop overflow and clean affected area	5 hours	7 hours	3 hours
The cost to you			
The permanent change in the amount you pay for wastewater services each year	No change	You save $X	You pay an extra $Y
Your choice			
If these were the only three options available to you, which option would you choose?	○	○	○

EXAMPLE ONLY

Answering questions about hypothetical situations

Research has shown that people tend to respond differently to hypothetical situations than they would in real life situations. This is most likely because they don't actually have to follow through with their choices in hypothetical situations. Although the situations presented in this survey are hypothetical, your responses will influence decisions about the management of the water system in Sydney, Blue Mountains and Illawarra, which will affect the number of wastewater overflows that occur and also the amount you pay for wastewater services. Therefore, please answer the questions as if you were really facing these decisions.

14. <choice question 1>

15. <choice question 2> RANDOMISE QUESTION ORDER AND LABEL CHOICE QUESTION 2 WITH PACKAGE C AND PACKAGE D, ETC.

16. <choice question 3>

17. <choice question 4>

18. <choice question 5>

19. <choice question 6>

Now a few questions about how you answered the choice questions.

20. Did you find the choice questions difficult to answer in the time you had available?

    d. They were very difficult questions

    e. They were somewhat difficult questions

    f. They were not difficult questions

21. Was the "current package" shown in each choice question similar to the level of service you currently get?

    d. Yes **SKIP TO Q23**

    e. No

    f. Don't know **SKIP TO Q23**

22. How did you go about answering the questions given you found the "current package" to be different to your experience?

    c. I assumed that by selecting "current package" I would be getting the service levels described in the question

    d. I assumed that by selecting "current package" I would be getting the service levels I have experienced in the past

23. Did you believe that Sydney Water would be able to deliver any of the packages presented?

    d. Yes **SKIP TO Q25**

    e. No

    f. Don't know **SKIP TO Q25**

24. When you saw packages that you did not believe Sydney Water could deliver, how did you go about answering the question(s)?

    c. I answered the question(s) as though I would be getting the service levels and bill impacts described in the packages

    d. I answered the question(s) as though I would be getting different service levels or bill impacts to those described in the packages

IF SELECTED AN OPTION OTHER THAN 'CURRENT PACKAGE' IN AT LEAST ONE CHOICE QUESTION, SKIP Q25 AND GO TO Q26 (IN OTHER WORDS, Q25 SHOULD BE SHOWN ONLY TO RESPONDENTS WHO CHOSE 'CURRENT PACKAGE' IN ALL SIX CHOICE QUESTIONS)

25. Why did you select the current package in every choice question? (tick as many as apply)

    h. I didn't have enough time to properly consider the options

    i. I didn't have enough information to be confident choosing the options

    j. I disagree with the idea of people paying to avoid wastewater overflows

    k. I disagree with the idea of offering people money to face more wastewater overflows

    l. I am concerned that Sydney Water might put prices up without making the service improvements

    m. I am concerned that Sydney Water might let service get worse without reducing prices

    n. Other _____

26. Earlier in the survey we told you that your responses will affect the number of wastewater overflows that happen and also the amount you pay for wastewater services. To what degree do you expect the results of this survey will affect decisions made by Sydney Water?

    d. I believe it is very likely the survey will affect Sydney Water's decisions

e. I believe it is somewhat likely the survey will affect Sydney Water's decisions

f. I don't think the survey will affect any of Sydney Water's decisions

CITIZEN ONLY

27. How many wastewater overflows can you recall experiencing at home?

_____ overflows in

_____ years.

BUSINESS ONLY

28. How many wastewater overflows can you recall experiencing at your business?

_____ overflows in

_____ years.

CITIZEN ONLY

29. How many wastewater overflows can you recall experiencing away from home (e.g. at work)?

_____ overflows in

_____ years.

BUSINESS ONLY

30. How many wastewater overflows can you recall experiencing away from your business (e.g. at home)?

_____ overflows in

_____ years.

SKIP Q31 IF

CITIZEN ANSWER TO BOTH Q27 AND Q29 WAS ZERO

BUSINESS ANSWER TO BOTH Q28 AND Q30 WAS ZERO

31. When was the most recent wastewater overflow you experienced?

a. In the past 6 months

b. 6-12 months ago

c. 1-2 years ago

d. 3-5 years ago

e. More than 5 years ago

32. Approximately how many different wastewater overflows have you come to know about talking to your friends, relatives, colleagues or neighbours?

_____ overflows

33. How many times have you been caught in traffic that was clearly caused by a wastewater overflow or work being done on wastewater pipes?

a. Several times

b. Once or twice

c. Never, as far as I know

CITIZEN ONLY

34. How often do you have someone at home during business hours on weekdays?

a. Never / very rarely

b. Some of the time

c. Very often / all of the time

d. Prefer not to say

35. Is the place you live in:

a. Owned outright or with a mortgage

b. Being rented or occupied rent-free

c. Other (please specify) _____

36. Do you speak a language other than English at home?

a. No, English only **SKIP TO Q38**

b. Yes

37. What is the main language spoken at home?

a. Arabic

b. Australian Indigenous Languages

c. Cantonese

d. Croatian
e. Dutch
f. French
g. German
h. Greek
i. Hindi
j. Indonesian
k. Italian
l. Japanese
m. Korean
n. Lebanese
o. Macedonian
p. Mandarin
q. Polish
r. Punjabi
s. Serbian
t. Spanish
u. Tagalog
v. Turkish
w. Vietnamese
x. Other (please specify) _____
y. Prefer not to say

38. Are you of Aboriginal or Torres Strait Islander origin?

a. Yes
b. No
c. Prefer not to say

39. Which best describes your household:

a. Couple/family without children at home
b. Couple/family with children at home
c. One parent family
d. Group household

e. Single person household

f. Other

40. What is your work status?

a. Working full time

b. Working part time/casually

c. Student

d. Not currently employed

e. Home duties

f. Retired

g. Other

41. What is your approximate annual household income before tax?

a. Less than $41,600

b. Between $41,600 and $78,000

c. Between $78,000 and $104,000

d. Between $104,000 and $156,000

e. More than $156,000

f. Do not wish to answer

42. In what type of dwelling do you live?

a. Separate house

b. Semi-detached, row or terrace house, townhouse

c. Flat or apartment

d. Other

BUSINESS ONLY

43. Can you continue to operate your business with a wastewater overflow outdoors on your property?

a. Yes

b. No, my business would need to stop operation

c. Other (please specify) _____

44. Do you have clients/customers at your business premises?

a. Never / very rarely
b. Some of the time
c. Very often / all of the time
d. Prefer not to say

45. How much of your business activity takes place at your business premises?

a. All/most of our business activity
b. Some of our business activity
c. Little/none of our business activity

46. Is your place of business:

a. Owned outright or with a mortgage
b. Being rented or occupied rent-free
c. Other (please specify) _____

47. For how many years has your business been operating?

a. Less than 1 year
b. 1-2 years
c. 2-5 years
d. 6-10 years
e. More than 10 years

48. Are you…

a. Male
b. Female
c. Non-gender-specific
d. Prefer not to say

49. What is your age?

a. Less than 18 years
b. 18-29 years
c. 30-39 years
d. 40-49 years
e. 50-59 years
f. 60-69 years
g. 70-79 years

h. 80 years or more

50. What is your position or title within your business?

a. Owner / proprietor

b. Senior management

c. Other employee

51. Finally, is there any feedback you would like to provide on this survey?

_____
_____
_____
_____

Thank you for participating in this survey. Your opinions are very important.

D Questionnaire – digital meters

Project	Sydney Water CIPA
Engagement	Digital meters
Sample	Citizens n=800 and businesses n=300

Welcome…

Thank you for participating in this survey, which is being run by Pureprofile and the Centre for International Economics on behalf of Sydney Water.

As part of Sydney Water's focus on putting customers at the heart of everything we do, we are asking our customers to provide their views on digital water meters. Your input is very important and will affect the metering technology we use.

This questionnaire will take around 15 minutes to complete. You don't need to know anything about water meters, as background information is provided.

We wish to reassure you that this is genuine market research and as always your individual survey responses will remain confidential and anonymous at all times.

In the unlikely event of any technical difficulties please click on the technical support e-mail link.

For other enquiries, please contact Sydney Water on 1800 627 687.

Please Keep In Mind…

Do not use your Back or Forward browser buttons while you are taking this survey. Once you answer a question, you will not be able to go back and change your answer.

Before we go through to the main study we would like to ask you a number of questions to make sure we are interviewing a good cross section of people.

1. Are you:

   Please select one.

   a. A business owner or sole trader with a commercial premises **GO TO BUSINESS VERSION**

   b. Responsible for managing business operations at a commercial premises **GO TO BUSINESS VERSION**

c. None of the above **GO TO CITIZEN VERSION**

CITIZEN ONLY

Please fill out this questionnaire on behalf of your household.

BUSINESS ONLY

Please fill out this questionnaire on behalf of your business.

CITIZEN ONLY

2. Do you or anyone in your household work for any of the following industries/organisations?

Water supply or wastewater services

Market research

IPART (Independent Pricing and Regulatory Tribunal)

NSW Health in a role related to water quality regulation

NSW Environment Protection Authority

a. Yes **TERMINATE**

b. No

BUSINESS ONLY

3. Does your business operate in the water and wastewater service or market research industries?

a. Yes **TERMINATE**

b. No

TERMINATE PAGE

Thank you for your patience in answering these questions. Unfortunately, we do not need you to participate in our research this time, but we sincerely appreciate your time and assistance today.

To keep up to date with opportunities to be involved in ongoing research and consultation, visit https://www.sydneywatertalk.com.au/

CITIZEN ONLY

4. How does your household get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

BUSINESS ONLY

5. How does your business get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

CITIZEN ONLY

Please give a rough estimate of the amount you pay for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small household, with no garden, using 25 kL each quarter, would pay $224
- a typical household, using 50 kL each quarter, would pay $276
- a large household or a household with a garden, using 75 kL each quarter, would pay $328

6. The amount I pay for water and wastewater services each quarter is about:

_____

BUSINESS ONLY

Please give a rough estimate of the amount your business pays for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small business, using a similar amount to a residential property (50 kL each quarter), would pay around $280 per quarter
- a business with slightly larger (25mm) pipes connecting to our network, using three times more water than a typical residential property, would pay around $670 per quarter
- businesses with larger pipes and higher water usage would pay higher amounts.

7. The amount my business pays for water and wastewater services each quarter is about:

_____

CITIZEN ONLY

8. What is the postcode of your home address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

BUSINESS ONLY

9. What is the postcode of your business address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

CITIZEN ONLY

10. Are you… **CHECK QUOTAS**

    a. Male

    b. Female

    c. Non-gender-specific

    d. Prefer not to say

CITIZEN ONLY

11. What is your age? **CHECK QUOTAS**

a. Less than 18 years **TERMINATE**
b. 18-29 years
c. 30-39 years
d. 40-49 years
e. 50-59 years
f. 60-69 years
g. 70-79 years
h. 80 years or more

BUSINESS ONLY

12. How many employees do you have in your business (full time equivalents other than the proprietor)? **CHECK QUOTAS**

a. Non-employing / sole trader
b. 1-4 employees
c. 5-19 employees
d. 20-199 employees
e. 200 employees or more **TERMINATE**

BUSINESS ONLY

13. In which industry does your business mainly operate? **CHECK QUOTAS**

a. Accommodation and Food Services
b. Administrative and Support Services
c. Agriculture, Forestry and Fishing
d. Arts and Recreation Services
e. Construction
f. Currently Unknown
g. Education and Training
h. Electricity, Gas, Water and Waste Services
i. Financial and Insurance Services

j. Health Care and Social Assistance
k. Information Media and Telecommunications
l. Manufacturing
m. Mining
n. Other Services
o. Professional, Scientific and Technical Services
p. Public Administration and Safety
q. Rental, Hiring and Real Estate Services
r. Retail Trade
s. Transport, Postal and Warehousing
t. Wholesale Trade

This questionnaire is about digital water meters.

It provides background information on digital meters and the benefits you might get from them. It asks which benefits you're most interested in and your views on Sydney Water installing these meters, given they may cost more than existing meters.

Sydney Water wants to understand what customers think about the potential benefits of digital meters across Sydney, the Blue Mountains and the Illawarra.

Unlike traditional meters, which are read in person each quarter, digital meters can provide you with more frequent information about water usage on your property. This could be hourly data, updated once a day.

Digital meters would be read automatically, meaning we wouldn't need to enter your property.

Sydney Water understands the sensitive nature of the data that would be collected by these meters and would safeguard your privacy and the security of the data.

As part of any program to install digital meters, you would be able to choose whether to get the following notifications from Sydney Water (most likely via SMS to your phone):

- Leak alerts
- High use notifications
- Bill predictions

- Check-in alerts

CITIZEN ONLY

Sydney Water could also provide an app or website portal where you could log in to see more detailed information, e.g.:

- Hourly usage data
- Usage comparisons to similar household types e.g. based on the number of residents and land size

BUSINESS ONLY

Sydney Water could also provide an app or website portal where you could log in to see more detailed information, e.g.:

- Hourly usage data
- Usage comparisons to similar businesses e.g. based on the industry and land size

We'll now provide information on each of these features and ask if you think you would use them.

Leak alerts

Digital meters can detect continual water flow above a certain threshold, which may be due to a leak. Sydney Water could send you an alert or notification if you have continual flow at your property over 24 hours. This could be useful for identifying a continually running toilet or a hidden leak, for example.

14. If you had a digital meter, would you choose to receive leak alerts?
    a. I would use this feature
    b. I would be likely to use this feature
    c. I would be unlikely use this feature
    d. I would not use this feature

CITIZEN ONLY

High use notifications

Sydney Water could send you an alert or notification when your daily water use goes over an amount that you specify. This could be useful for catching watering systems that have been left on, or hoses being used to top up swimming pools, before they cause large water bills.

BUSINESS ONLY

High use notifications

Sydney Water could send you an alert or notification when your daily water use goes over an amount that you specify. This could be useful for catching watering systems that have been left on or malfunctioning equipment before they cause large water bills.

15. If you had a digital meter, would you choose to receive high use notifications?
    a. I would use this feature
    b. I would be likely to use this feature
    c. I would be unlikely use this feature
    d. I would not use this feature

Bill predictions

By understanding your average daily use, Sydney Water could send you an estimate of your next water bill early in the billing cycle. This could help you manage your finances by avoiding unexpected changes in quarterly bills.

16. If you had a digital meter, would you choose to receive bill predictions?
    a. I would use this feature

b. I would be likely to use this feature

c. I would be unlikely use this feature

d. I would not use this feature

CITIZEN ONLY

Check-in alerts

Sydney Water could allow you to get check-in alerts about water usage at other properties that have provided permission. For example, you could get an alert:

- when water is used at a vacant property or holiday house you manage
- when daily water use falls to zero at an elderly relative's property, which could alert you to a health problem.

BUSINESS ONLY

Check-in alerts

Sydney Water could allow you to get check-in alerts about water usage at other properties that have provided permission. For example, you could get an alert:

- when water is used over the weekend or a holiday period while the property isn't in use
- when daily water use falls to zero at a property you manage, which could alert you to an operational problem.

17. If you had a digital meter, would you choose to receive check-in alerts?

    a. I would use this feature

    b. I would be likely to use this feature

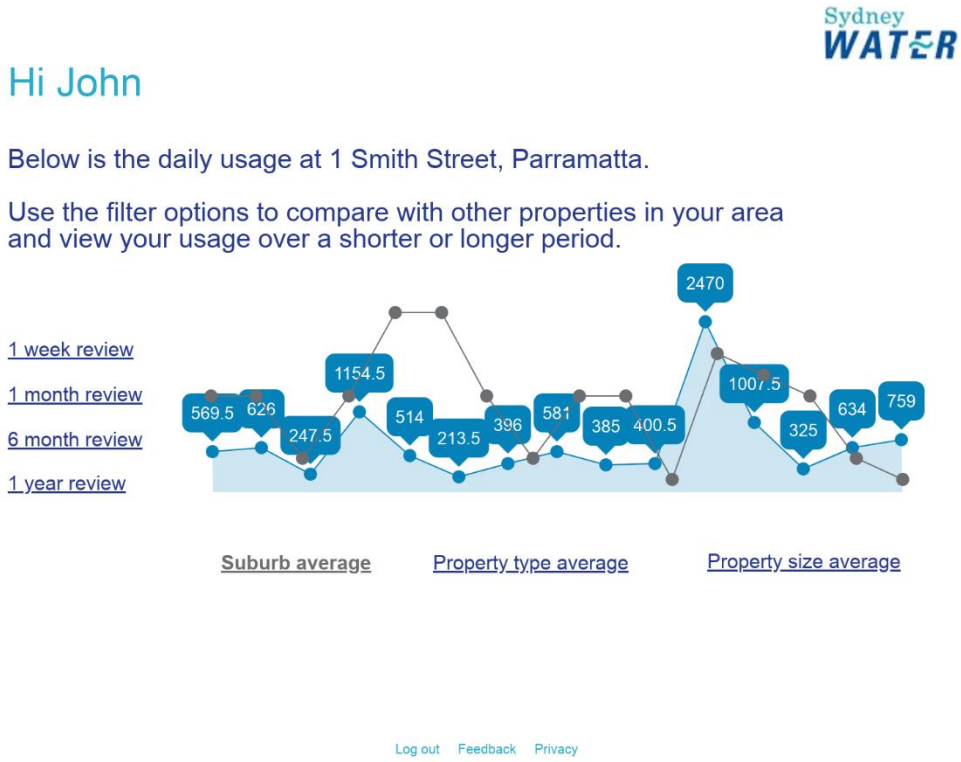
    c. I would be unlikely use this feature

    d. I would not use this feature

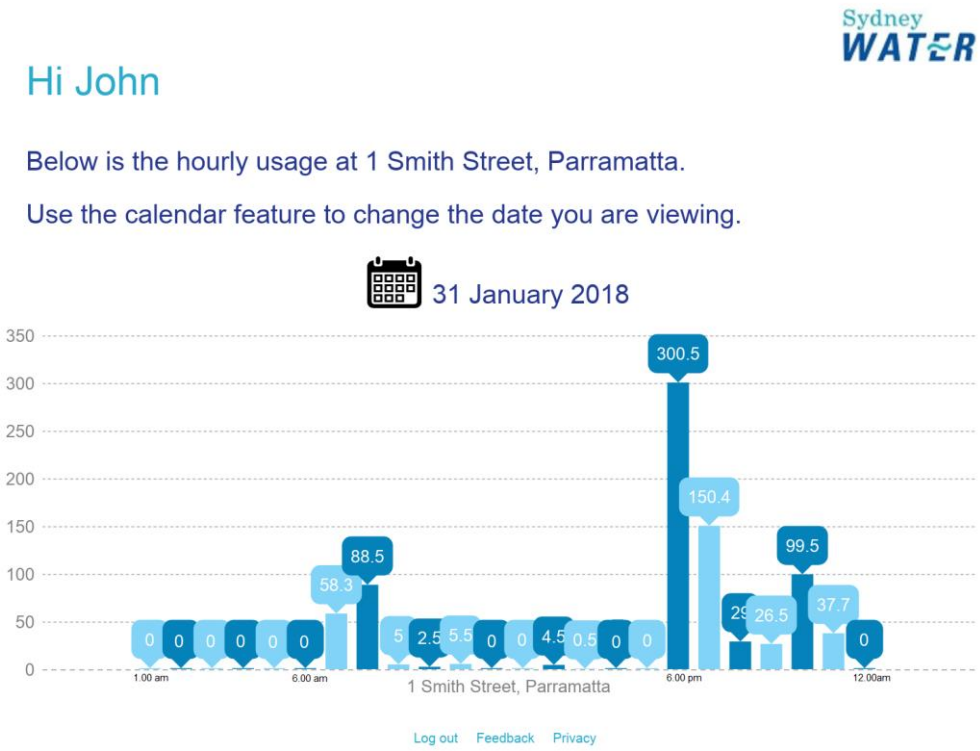
App and/or website portal

An app or web portal could show you:

- how your daily water usage compares to other properties with similar features. You may find this useful during times of drought when water conservation is even more important.



- hourly water usage, which would allow you to check the usage on your property in greater detail.



This information would not be "pushed" to you automatically as for the earlier options. You would need to log in and look at the data yourself.

18. If you had a digital meter, would you log in to an app or web portal?
    a. I would use this feature
    b. I would be likely to use this feature
    c. I would be unlikely use this feature
    d. I would not use this feature

Digital meters may be more expensive than the water meters we have used in the past. While some of that cost would be paid for by not having to read meters in person and from finding leaking pipes more quickly, some of the cost may need to be paid for by increases in water bills.

We want to know your views on installing digital meters.

Research has shown that people respond differently in surveys than they would in real life situations when they think they won't have to follow through with their answers.

Your answer to the next question will affect the decision to install digital meters, and also the size of your water bill. Please answer the question as if you were really facing this decision.

Also, please remember your income is limited and there may be other things you want to pay for.

CITIZEN ONLY

19. While digital meters would deliver the benefits described in this survey, they may be more expensive than ordinary meters. We are interested in knowing if these benefits would be of value to you as a customer. If a program to install digital meters would permanently increase the amount you pay for water and wastewater services by…

    $X <drawn from $1, $3, $5, $7, $10, $15> per quarter

    … would you vote for the program?

    a. At that cost to me, I definitely would vote for the program **SKIP Q21**
    b. At that cost to me, I probably would vote for the program **SKIP Q21**
    c. At that cost to me, I am not sure whether I would vote for the program **SKIP Q22**
    d. At that cost to me, I probably would not vote for the program **SKIP Q22**
    e. At that cost to me, I definitely would not vote for the program **SKIP Q22**

BUSINESS ONLY

20. While digital meters would deliver the benefits described in this survey, they may be more expensive than ordinary meters. We are interested in knowing if these benefits would be of value to you as a customer. If a program to install digital meters would permanently increase the amount you pay for water and wastewater services by…

    $X <drawn from 0.5%, 1%, 1.5%, 2%, 3%, 5% of the bill amount reported in Q7> per quarter

    … would you vote for the program?

    a. At that cost to me, I definitely would vote for the program **SKIP Q21**

b. At that cost to me, I probably would vote for the program **SKIP Q21**

c. At that cost to me, I am not sure whether I would vote for the program **SKIP Q22**

d. At that cost to me, I probably would not vote for the program **SKIP Q22**

e. At that cost to me, I definitely would not vote for the program **SKIP Q22**

21. What were the main reasons for your decision? (tick as many as apply) **ROTATE**

o. I share a water meter with one or more other households/businesses

p. Digital meters seem like poor value for money

q. The information about digital meters was too confusing

r. I didn't have enough information to be confident voting for digital meters

s. I disagree with the idea of people paying for information about their own water use

t. I am concerned Sydney Water will not be able to deliver all of the features described in this survey

u. I am concerned that Sydney Water might put prices up without providing the new meters/features

v. I am concerned about how Sydney Water might use detailed information about my water usage

w. I am concerned detailed information about my water usage might fall into the wrong hands

x. I do not care about my water usage

y. I do not think I should be the one paying for digital meters

z. Other _____

22. What were the main reasons for your decision? (tick as many as apply) **ROTATE**

a. The notification or app/website features

b. I am an early adopter of new technology

c. Digital meters will improve water conservation

d. Digital meters will remove the need for meter readers to access my property

e. Other _____

23. Earlier in the survey we told you that your responses will affect the decision to install digital meters and also the size of your water bill. To what degree do you expect the results of this survey will affect decisions made by Sydney Water?

g. I believe it is very likely the survey will affect Sydney Water's decisions

h. I believe it is somewhat likely the survey will affect Sydney Water's decisions

i. I don't think the survey will affect any of Sydney Water's decisions

Finally, a few questions about you.

24. Does your property have its own water meter?

a. Yes

b. No, I share a water meter with other dwellings/businesses

c. No, I don't have a water meter

d. Don't know

CITIZEN ONLY

25. Is the place you live in:

a. Owned outright or with a mortgage

b. Being rented or occupied rent-free

c. Other (please specify) _____

26. Do you speak a language other than English at home?

a. No, English only **SKIP TO Q28**

b. Yes

27. What is the main language spoken at home?

a. Arabic

b. Australian Indigenous Languages

c. Cantonese

d. Croatian
e. Dutch
f. French
g. German
h. Greek
i. Hindi
j. Indonesian
k. Italian
l. Japanese
m. Korean
n. Lebanese
o. Macedonian
p. Mandarin
q. Polish
r. Punjabi
s. Serbian
t. Spanish
u. Tagalog
v. Turkish
w. Vietnamese
x. Other (please specify) _____
y. Prefer not to say

28. Are you of Aboriginal or Torres Strait Islander origin?

a. Yes
b. No
c. Prefer not to say

29. Which best describes your household:

a. Couple/family without children at home
b. Couple/family with children at home
c. One parent family
d. Group household

e. Single person household

f. Other

30. What is your work status?

a. Working full time

b. Working part time/casually

c. Student

d. Not currently employed

e. Home duties

f. Retired

g. Other

31. What is your approximate annual household income before tax?

a. Less than $41,600

b. Between $41,600 and $78,000

c. Between $78,000 and $104,000

d. Between $104,000 and $156,000

e. More than $156,000

f. Do not wish to answer

32. In what type of dwelling do you live?

a. Separate house

b. Semi-detached, row or terrace house, townhouse

c. Flat or apartment

d. Other

BUSINESS ONLY

33. Do you have clients/customers at your business premises?

a. Never / very rarely

b. Some of the time

c. Very often / all of the time

d. Prefer not to say

34. How much of your business activity takes place at your business premises?

a. All/most of our business activity
b. Some of our business activity
c. Little/none of our business activity
d. Prefer not to say

35. Is your place of business:

a. Owned outright or with a mortgage
b. Being rented or occupied rent-free
c. Other (please specify) _____

36. For how many years has your business been operating?

a. Less than 1 year
b. 1-2 years
c. 2-5 years
d. 6-10 years
e. More than 10 years

37. Are you…

e. Male
f. Female
g. Non-gender-specific
h. Prefer not to say

38. What is your age?

i. Less than 18 years
j. 18-29 years
k. 30-39 years
l. 40-49 years
m. 50-59 years
n. 60-69 years
o. 70-79 years
p. 80 years or more

39. What is your position or title within your business?

a. Owner / proprietor
b. Senior management

c. Other employee

40. Finally, is there any feedback you would like to provide on this survey?

_____
_____
_____
_____

Thank you for participating in this survey. Your opinions are very important.

E Questionnaire – ocean outfalls/water pressure

Project	Sydney Water CIPA
Engagement	Wastewater ocean outfalls and water pressure
Sample	Citizens n=800 and businesses n=300

Welcome…

Thank you for participating in this survey, which is being run by Pureprofile and the Centre for International Economics on behalf of Sydney Water.

As part of Sydney Water's focus on putting customers at the heart of everything we do, we are asking our customers to provide their views on wastewater ocean outfalls and water pressure. Your input is very important and will affect public health and environmental outcomes on Sydney's coastline and the water pressure experienced by our customers.

This questionnaire will take around 15 minutes to complete. You don't need to know anything about wastewater ocean outfalls or water pressure, as background information is provided.

We wish to reassure you that this is genuine market research and as always your individual survey responses will remain confidential and anonymous at all times.

In the unlikely event of any technical difficulties please click on the technical support e-mail link.

For other enquiries, please contact Sydney Water on 1800 627 687.

Please Keep In Mind…

Do not use your Back or Forward browser buttons while you are taking this survey. Once you answer a question, you will not be able to go back and change your answer.

Before we go through to the main study we would like to ask you a number of questions to make sure we are interviewing a good cross section of people.

1. Are you:

   Please select one.

a. A business owner or sole trader with a commercial premises **GO TO BUSINESS VERSION**

b. Responsible for managing business operations at a commercial premises **GO TO BUSINESS VERSION**

c. None of the above **GO TO CITIZEN VERSION**

CITIZEN ONLY

Please fill out this questionnaire on behalf of your household.

BUSINESS ONLY

Please fill out this questionnaire on behalf of your business.

CITIZEN ONLY

2. Do you or anyone in your household work for any of the following industries/organisations?

Water supply or wastewater services

Market research

IPART (Independent Pricing and Regulatory Tribunal)

NSW Health in a role related to water quality regulation

NSW Environment Protection Authority

a. Yes **TERMINATE**

b. No

BUSINESS ONLY

3. Does your business operate in the water and wastewater service or market research industries?

a. Yes **TERMINATE**

b. No

TERMINATE PAGE

Thank you for your patience in answering these questions. Unfortunately, we do not need you to participate in our research this time, but we sincerely appreciate your time and assistance today.

To keep up to date with opportunities to be involved in ongoing research and consultation, visit https://www.sydneywatertalk.com.au/

CITIZEN ONLY

4. How does your household get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

BUSINESS ONLY

5. How does your business get water and wastewater bills?

   a. I get bills from Sydney Water

   b. I get bills from Sydney Water and from my body corporate

   c. My landlord/managing agent gets bills from Sydney Water and charges the full amount to me as a specific charge separate from rent

   d. My landlord/managing agent gets bills from Sydney Water and charges part of the bill to me as a specific charge separate from rent

   e. My landlord/managing agent charges me an amount for water and wastewater, separate from rent, but I don't know how that amount relates to the Sydney Water bill

   f. I don't pay a separate amount for water and wastewater **TERMINATE**

CITIZEN ONLY

Please give a rough estimate of the amount you pay for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small household, with no garden, using 25 kL each quarter, would pay $224
- a typical household, using 50 kL each quarter, would pay $276
- a large household or a household with a garden, using 75 kL each quarter, would pay $328

6. The amount I pay for water and wastewater services each quarter is about:

_____

BUSINESS ONLY

Please give a rough estimate of the amount your business pays for water and wastewater services each quarter.

If you receive bills from Sydney Water:

- a small business, using a similar amount to a residential property (50 kL each quarter), would pay around $280 per quarter
- a business with slightly larger (25mm) pipes connecting to our network, using three times more water than a typical residential property, would pay around $670 per quarter
- businesses with larger pipes and higher water usage would pay higher amounts.

7. The amount my business pays for water and wastewater services each quarter is about:

_____

CITIZEN ONLY

8. What is the postcode of your home address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

BUSINESS ONLY

9. What is the postcode of your business address? **TERMINATE IF OUT OF AREA. CHECK QUOTAS.**

_____

CITIZEN ONLY

10. Are you… **CHECK QUOTAS**

    a. Male

b. Female
c. Non-gender-specific
d. Prefer not to say

CITIZEN ONLY

11. What is your age? **CHECK QUOTAS**

a. Less than 18 years **TERMINATE**
b. 18-29 years
c. 30-39 years
d. 40-49 years
e. 50-59 years
f. 60-69 years
g. 70-79 years
h. 80 years or more

BUSINESS ONLY

12. How many employees do you have in your business (full time equivalents other than the proprietor)? **CHECK QUOTAS**

a. Non-employing / sole trader
b. 1-4 employees
c. 5-19 employees
d. 20-199 employees
e. 200 employees or more **TERMINATE**

BUSINESS ONLY

13. In which industry does your business mainly operate? **CHECK QUOTAS**

a. Accommodation and Food Services
b. Administrative and Support Services
c. Agriculture, Forestry and Fishing
d. Arts and Recreation Services
e. Construction

f. Currently Unknown
g. Education and Training
h. Electricity, Gas, Water and Waste Services
i. Financial and Insurance Services
j. Health Care and Social Assistance
k. Information Media and Telecommunications
l. Manufacturing
m. Mining
n. Other Services
o. Professional, Scientific and Technical Services
p. Public Administration and Safety
q. Rental, Hiring and Real Estate Services
r. Retail Trade
s. Transport, Postal and Warehousing
t. Wholesale Trade

RANDOMLY ALLOCATE OR CYCLE RESPONDENTS TO SEE EITHER:

This questionnaire has three parts:

- Part 1 provides information on wastewater ocean outfalls and asks your views
- Part 2 provides information on minimum standards for water pressure and asks your views
- Part 3 asks some questions about you

OR

This questionnaire has three parts:

- Part 1 provides information on minimum standards for water pressure and asks your views
- Part 2 provides information on wastewater ocean outfalls and asks your views
- Part 3 asks some questions about you

THEN ORDER THE FOLLOWING PARTS ACCORDINGLY

PART ON WASTEWATER OCEAN OUTFALLS

This part of the questionnaire is about wastewater ocean outfalls at Sydney cliff faces.

It will cover:

- Background information on wastewater ocean outfalls at Sydney cliff faces, the impacts they are having on public health and environmental risks, and work Sydney Water can do to reduce those impacts
- Questions about whether you want Sydney Water to do that work, given the cost would need to be recovered through water and wastewater bills
- Questions about your household

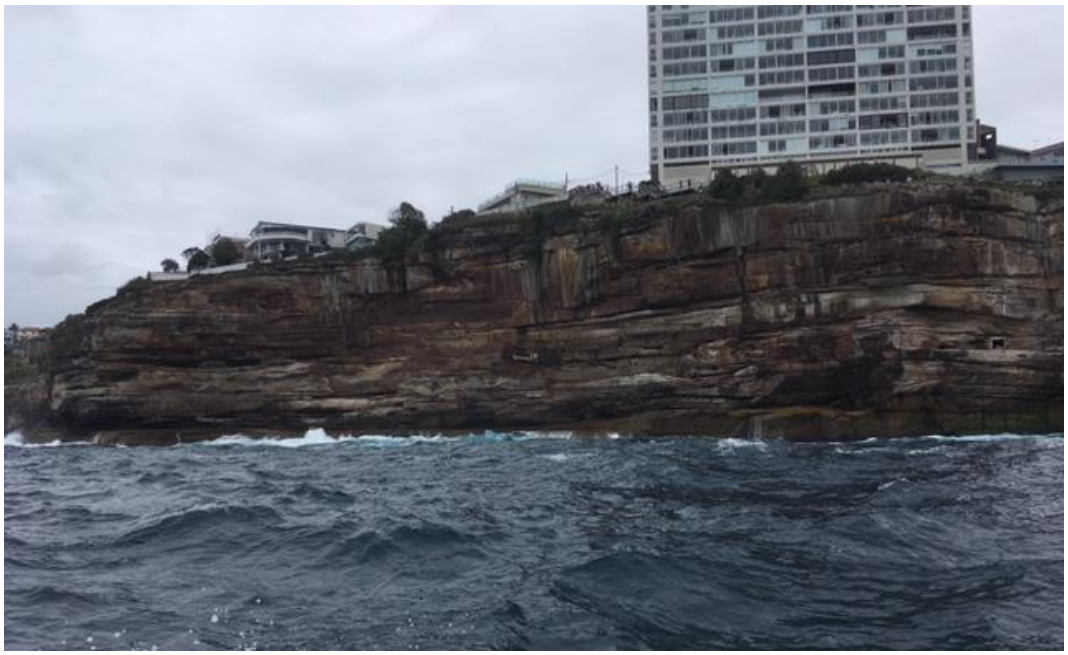
Wastewater is the used water that goes down sinks, toilets and drains.

Most of Sydney's wastewater is treated and released deep in the ocean, but there are three outfalls in Sydney, built between 1916 and 1936, that release raw (untreated) wastewater at the base of cliff faces under the sea.

This is the only wastewater system in New South Wales that that puts untreated wastewater into the ocean 365 days of the year.

Every day, these three outfalls put four Olympic swimming pools' worth of raw wastewater into the ocean, along with 2-3 wheelie bins' worth of plastics and hygiene products.

Despite this, water quality testing that occurs every six days at recreational areas near the outfalls continuously shows very good water quality. The pollutants are in a relatively small area of ocean at the bottom of cliff faces.

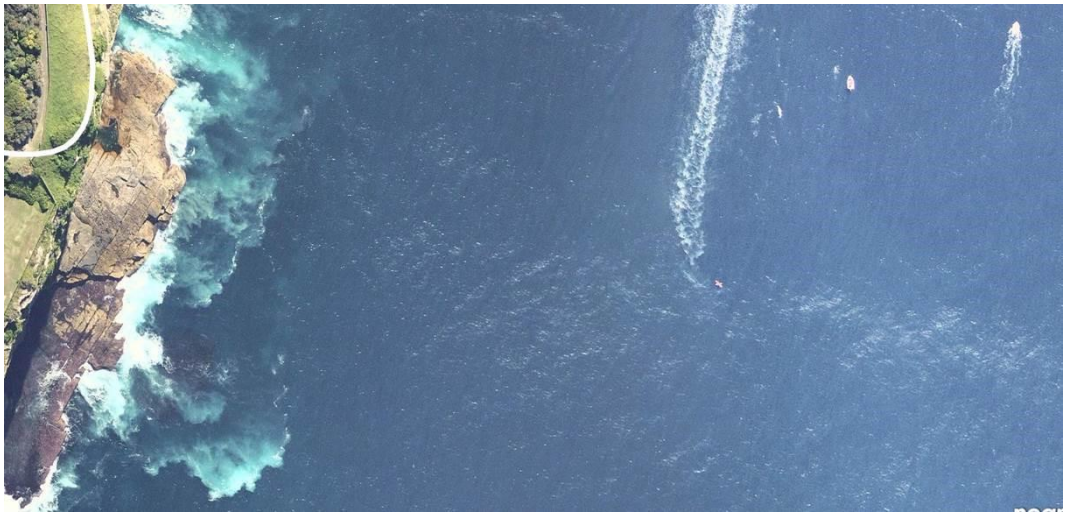


There are two main problems caused by the raw wastewater outfalls:

- Public health risks
- Ecosystem impacts

Public health risks close to the outfall sites

- A Sydney Water pollution study found that around 2000 people visit the affected areas each year for spear fishing, rock fishing and swimming
- Around 300 people have direct contact with pollutants through organised swim and paddle events



Ecosystem impacts close to the outfall sites

- Degraded ocean floor habitat, with barren areas and 'brown fuzz'
- Increased growth of algae
- More opportunistic species in the area
- Floating rubbish, which can harm sea creatures by swallowing or becoming tangled
- A bad smell, including on cliff tops
- Visible 'plume' in the water 75% of the time, including oil and grease on top of the water

Sydney Water can reduce these public health and ecosystem impacts by investing in new infrastructure to divert the raw wastewater into another part of the network where it will be treated.

After this investment, no wastewater would be released from the three outfalls during dry weather.

Wastewater flows are highest when it rains, because rain gets into the wastewater system through faulty private plumbing and cracks in pipes. The new infrastructure would not be able to divert all of this extra wastewater. As a result, some diluted raw wastewater would be released from the three outfalls when it rains.

This new infrastructure would come at a cost that needs to be recovered in Sydney Water bills paid by you and other customers. We want to know your views on this project.

Your answer to the next question will affect the decision about how much raw wastewater is released into the ocean and also the size of your water bill. Please answer the question as if you were really facing this decision.

Also, please remember your income is limited and there may be other environmental causes you want to pay for.

CITIZEN ONLY

14. Sydney Water could do a project to stop the daily release of raw wastewater from cliff face outfalls so that they instead release only when it rains. If this project added a one-off amount of…

    $X <draw from $1, $3, $5, $7, $10, $15, $25, $35, $50>

    …to one of your water and wastewater bills, would you vote for the program?

    a. At that cost to me, I definitely would vote for the program **SKIP Q16**
    b. At that cost to me, I probably would vote for the program **SKIP Q16**
    c. At that cost to me, I am not sure whether I would vote for the program
    d. At that cost to me, I probably would not vote for the program
    e. At that cost to me, I definitely would not vote for the program

BUSINESS ONLY

15. Sydney Water could do a project to stop the daily release of raw wastewater from cliff face outfalls so that they instead release only when it rains. If this project added a one-off amount of…

    $X <draw from 0.5%, 1.0%, 1.5%, 2.0%, 3.0%, 5.0%, 7.5%, 10.0%, 15.0% of the quarterly bill amount reported in Q7>

    …to one of your water and wastewater bills, would you vote for the program?

    a. At that cost to me, I definitely would vote for the program **SKIP Q16**
    b. At that cost to me, I probably would vote for the program **SKIP Q16**
    c. At that cost to me, I am not sure whether I would vote for the program
    d. At that cost to me, I probably would not vote for the program
    e. At that cost to me, I definitely would not vote for the program

16. What were the main reasons for your decision? (tick as many as apply) **ROTATE**

a. The project is not good value for money
b. The project description was too confusing
c. I didn't have enough information to be confident voting for the project
d. I disagree with the idea of people paying to stop raw wastewater being put in the ocean
e. I am concerned that Sydney Water might put prices up without fixing the wastewater outfalls
f. I am concerned Sydney Water would not put my bill back down after the one-off increase
g. Ocean water quality in a small, inaccessible area is not a big problem
h. I do not visit Sydney's coastline very often
i. I do not think I should be the one paying for the project
j. Other _____

CITIZEN ONLY

17. How often do you visit the rocky parts of Sydney's coastline?

a. Never / very rarely
b. Some of the time
c. Very often

18. Which activities does your household use Sydney's beaches and coastline for? (tick all that apply)

a. Swimming
b. Fishing
c. Paddling/kayak
d. My household never uses Sydney's beaches or coastline
e. Other (please specify) _____

BUSINESS ONLY

19. Is your business affected by the reputation of Sydney's coastline?

a. My business is significantly affected
b. My business is slightly affected
c. My business is not affected

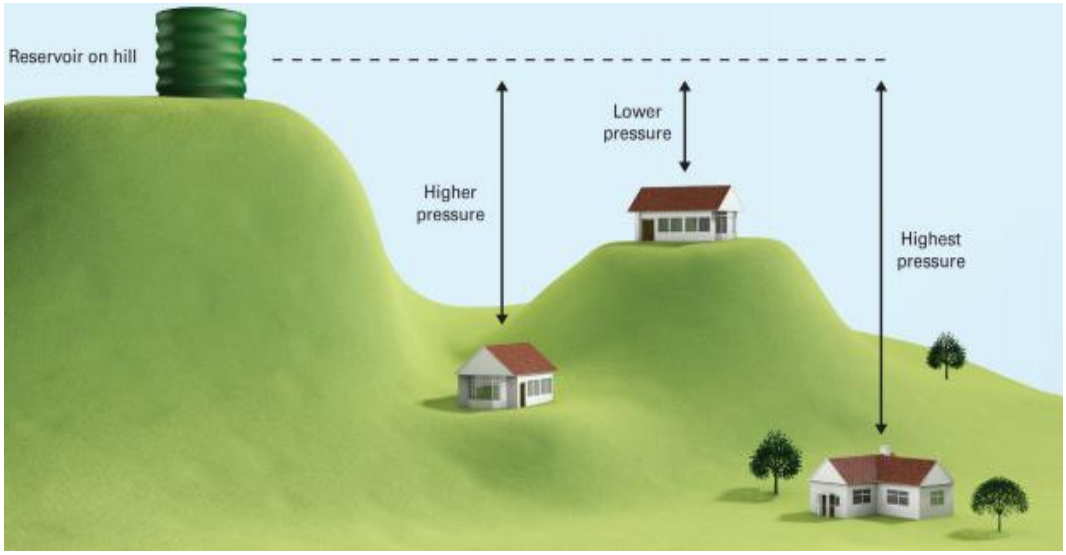
END OF WASTEWATER OCEAN OUTFALLS SECTION

PART ON WATER PRESSURE

This part of the questionnaire is about minimum standards for water pressure.

It provides background information on water pressure and a small group of customers that experience chronic low pressure. It then asks whether you would be willing to pay an additional amount on your bill to improve service to these customers.

Water gets to customers through a network of water supply zones. Water reservoirs are located at high points in each water supply zone. Water gets from the reservoir across the zone using gravity. Water pressure varies at different locations in the zone depending on how far you are from the reservoir and your elevation in relation to the reservoir.



Water pressure in our system can fall when people are using water or when a pipe breaks. In areas with lower pressure, this may result in slow flow of water from your taps. You may notice:

- taking a few minutes to fill a bucket
- only a trickle of water coming from second-floor taps/shower
- not being able to use water in more than one place in the home (e.g. not being able to shower while using the washing machine).

There are around 130 properties in Sydney that experience these low-water-pressure events on an almost daily basis.

Sydney Water can improve water pressure to these 'worst-served' properties by investing in water pressure booster pumps.

This investment comes at a cost that would need to be paid for by Sydney Water bills.

We want to know whether you would be willing to pay to bring the service level for these 130 properties up to the minimum level experienced by the rest of Sydney, the Blue Mountains and the Illawarra.

Your answer to the next question will affect the decision whether to improve service to customers experiencing ongoing low water pressure and also the size of your water bill. Please answer the question as if you were really facing this decision.

Also, please remember your income is limited and there may be other things you want to pay for.

CITIZEN ONLY

20. If a program to improve water pressure to 130 worst-served customers added a one-off amount of…

    $X <draw from $1, $3, $5, $7, $10, $15>

    … to one of your water and wastewater bills, would you vote for the program?

    a. At that cost to me, I definitely would vote for the program **SKIP Q22**
    b. At that cost to me, I probably would vote for the program **SKIP Q22**
    c. At that cost to me, I am not sure whether I would vote for the program
    d. At that cost to me, I probably would not vote for the program
    e. At that cost to me, I definitely would not vote for the program

BUSINESS ONLY

21. If a program to improve water pressure to 130 worst-served customers added a one-off amount of…

    $X < draw from 0.5%, 1.0%, 1.5%, 2.0%, 3.0%, 5.0% of quarterly bill amount reported at Q7>

    … to one of your water and wastewater bills, would you vote for the program?

    a. At that cost to me, I definitely would vote for the program **SKIP Q22**
    b. At that cost to me, I probably would vote for the program **SKIP Q22**
    c. At that cost to me, I am not sure whether I would vote for the program
    d. At that cost to me, I probably would not vote for the program
    e. At that cost to me, I definitely would not vote for the program

22. What were the main reasons for your decision? (tick as many as apply) **ROTATE**

    a. The program seems like poor value for money
    b. The information about water pressure was too confusing
    c. I didn't have enough information to be confident voting for the program
    d. I disagree with the idea of people paying to get a basic level of service
    e. I am concerned that Sydney Water might put prices up without fixing the water pressure problem
    f. I do not care about the water pressure experienced by other people
    g. I do not think I should be the one paying for the program
    h. Other _____

23. How many times have you experienced low water pressure at your property?

    a. Never
    b. Once or twice
    c. Three times or more

24. Has a friend, relative, colleague or neighbour told you about a water pressure failure they experienced and how it affected them?

    a. Yes
    b. No / Don't know

BUSINESS ONLY

25. Can you continue to operate your business during a water pressure failure?

    a. Yes

    b. No, my business would need to stop operation during a water pressure failure

    c. My business would need to stop operation if the water pressure failure lasted for a period of more than (please specify) _____

END OF WATER PRESSURE SECTION

26. Earlier in the survey we told you that your responses will affect decisions about wastewater ocean outfalls and water pressure and also the size of your water bill. To what degree do you expect the results of this survey will affect decisions made by Sydney Water?

    a. I believe it is very likely the survey will affect Sydney Water's decisions

    b. I believe it is somewhat likely the survey will affect Sydney Water's decisions

    c. I don't think the survey will affect any of Sydney Water's decisions

CITIZEN ONLY

27. Is the place you live in:

    a. Owned outright or with a mortgage

    b. Being rented or occupied rent-free

    c. Other (please specify) _____

28. Do you speak a language other than English at home?

    a. No, English only **SKIP TO Q38**

    b. Yes

29. What is the main language spoken at home?

    a. Arabic

    b. Australian Indigenous Languages

    c. Cantonese

    d. Croatian

e. Dutch
f. French
g. German
h. Greek
i. Hindi
j. Indonesian
k. Italian
l. Japanese
m. Korean
n. Lebanese
o. Macedonian
p. Mandarin
q. Polish
r. Punjabi
s. Serbian
t. Spanish
u. Tagalog
v. Turkish
w. Vietnamese
x. Other (please specify) _____
y. Prefer not to say

30. Are you of Aboriginal or Torres Strait Islander origin?

a. Yes
b. No
c. Prefer not to say

31. Which best describes your household:

a. Couple/family without children at home
b. Couple/family with children at home
c. One parent family
d. Group household
e. Single person household

f. Other

32. What is your work status?

a. Working full time
b. Working part time/casually
c. Student
d. Not currently employed
e. Home duties
f. Retired
g. Other

33. What is your approximate annual household income before tax?

a. Less than $41,600
b. Between $41,600 and $78,000
c. Between $78,000 and $104,000
d. Between $104,000 and $156,000
e. More than $156,000
f. Do not wish to answer

34. In what type of dwelling do you live?

a. Separate house
b. Semi-detached, row or terrace house, townhouse
c. Flat or apartment
d. Other

BUSINESS ONLY

35. Do you have clients/customers at your business premises?

a. Never / very rarely
b. Some of the time
c. Very often / all of the time
d. Prefer not to say

36. How much of your business activity takes place at your business premises?

a. All/most of our business activity

b. Some of our business activity
c. Little/none of our business activity
d. Prefer not to say

37. Is your place of business:

a. Owned outright or with a mortgage
b. Being rented or occupied rent-free
c. Other (please specify) _____

38. For how many years has your business been operating?

a. Less than 1 year
b. 1-2 years
c. 2-5 years
d. 6-10 years
e. More than 10 years

39. Are you…

a. Male
b. Female
c. Non-gender-specific
d. Prefer not to say

40. What is your age?

a. Less than 18 years
b. 18-29 years
c. 30-39 years
d. 40-49 years
e. 50-59 years
f. 60-69 years
g. 70-79 years
h. 80 years or more

41. What is your position or title within your business?

a. Owner / proprietor
b. Senior management

c. Other employee

42. Finally, is there any feedback you would like to provide on this survey?

_____
_____
_____
_____

Thank you for participating in this survey. Your opinions are very important.

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