

**SUMMARY**

This paper seeks to provide Water forum members with an overview of our waste water service to allow members to fully engage with and challenge the customer focused nature of our PR19 waste water strategy. It includes an introduction to our waste water service, and a summary of our current performance and the main challenges we face. It also sets out the customer engagement and research that underpins the creation of our strategy.

The paper will be supported by a brief presentation at the Water Forum on 1 November which will highlight key points from the customer engagement and significant elements of the strategy.

**OUR WASTE WATER SERVICE**

Northumbrian Water (NW) collects sewage and surface water from homes and businesses across the North East. We transport that waste via almost 30,000km of sewer network and almost 1,000 pumping stations to more than 400 sewage treatment works where the effluent is treated before it is returned clean to our rivers and seas. During treatment, sewage sludge is produced; historically seen as a waste product we now convert this ‘fuel’ into renewable energy, before the remaining ‘bio-resources’ product is spread on land as a highly effective fertiliser. Figure 1 illustrates the waste water service below.

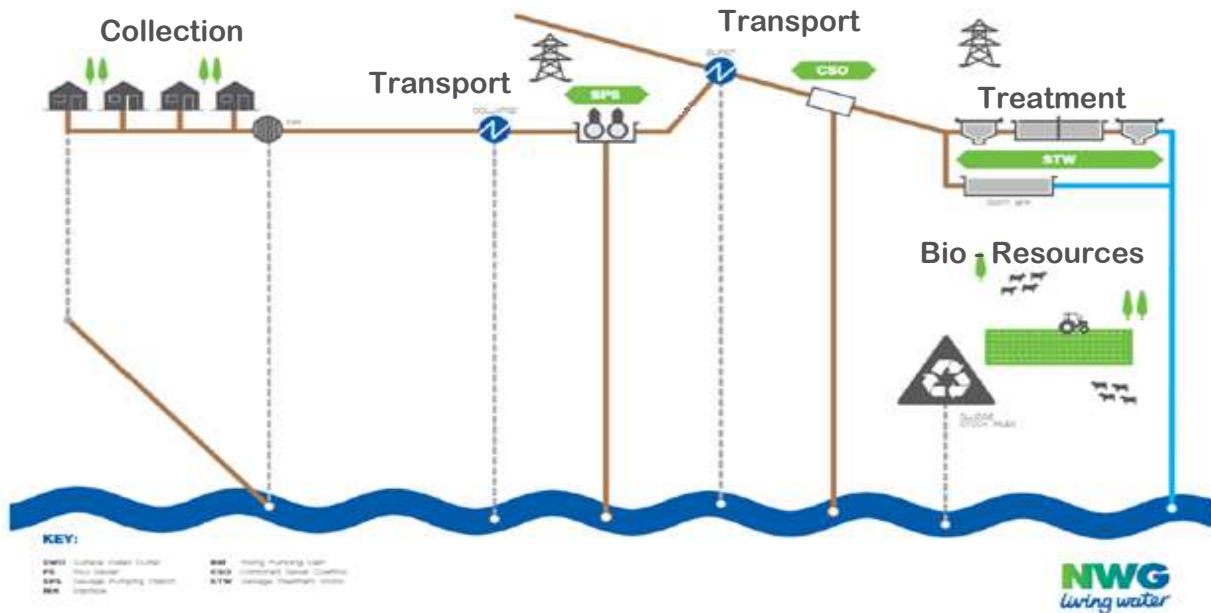


Figure 1: Diagram of the waste water service; collection, transportation, treatment and safe return to rivers and the sea and sludge management or bio resources. It also highlights the potential areas for both controlled and uncontrolled discharges from waste water assets a consequence of which could be flooding or pollution.

There are multiple challenges associated with the collection and transportation of sewage and surface water. Sewers can become overwhelmed with heavy rain, can collapse or break, or can become blocked by items that should not be in them such as wet wipes or fats, oils and grease. All of these issues increase the risk of pollution or flooding.

The majority of our sewers transport sewage by gravity and we also use pumping stations (PS) where required. Our PS asset base increased in 2016 through the transfer of private pumping stations. The vast majority of our PS are monitored and we use the data from these monitors to optimise maintenance and proactively respond to issues before they impact on customers or the environment.

As our sewers transport surface water which is impacted dramatically by rainfall, there are relief points which protect homes and businesses from flooding; these relief points are called Combined Sewer Overflows (CSOs). These CSOs are screened and allow diluted sewage to spill into the nearest water body during rainfall events. Occasionally, during rainfall events our screens in CSOs can become blinded meaning that

litter can also overflow into waterbodies along with the diluted sewage. There is a risk that CSOs or our network can block and cause a spill into water bodies when it isn't raining. The majority of our CSOs are monitored which allows us to proactively reduce spills not associated with rainfall.

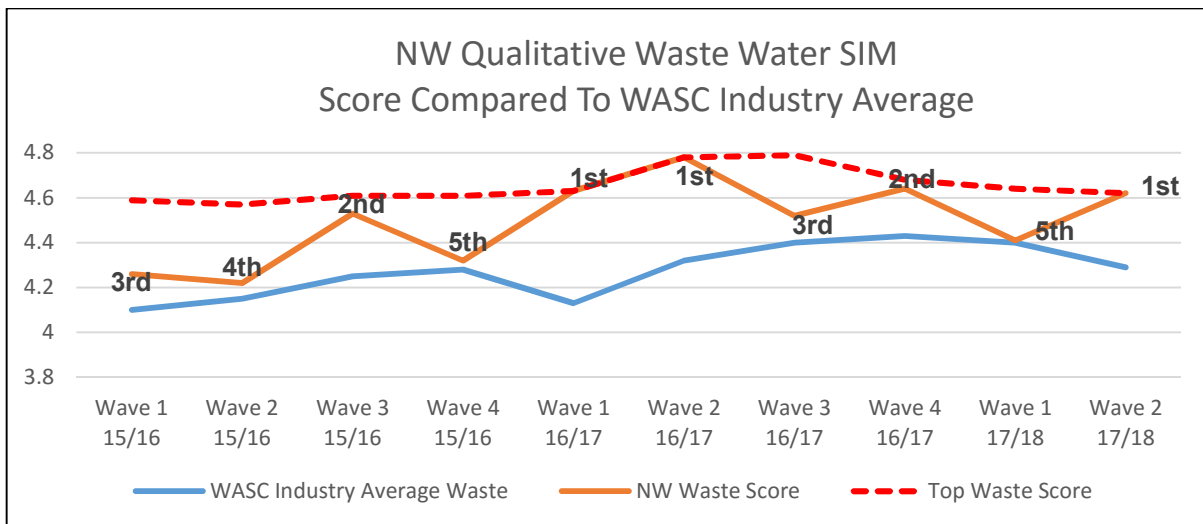
As described above during treatment sewage sludge is produced. We are very proud to be the first and only company to convert 100% of our sludge into renewable energy and as a result Ofwat has recognised NW as the most efficient company in relation to sewage sludge or bio-resources.

**Current Performance**

Together with our customers we developed outcomes and measures of success to demonstrate to customers our continuing improvements in performance on areas which matter to them. This section sets our current and past performance against these measures of success and highlights key areas of challenge.

Service Incentive Mechanism (SIM) – focus on waste water service

We have worked hard to increase the performance in both qualitative and quantitative SIM scores in relation to the waste water service. We have a dedicated waste water service customer champions group which drives improved performance and we have implemented a number of initiatives to increase customer satisfaction and proactively reduce the risk of issues affecting customers which are highlighted under the flooding and pollution metrics below. Graph 1 below illustrates the waste water qualitative SIM score during the last three years. We are very proud of our 2016/17 qualitative waste water SIM performance which was the best in the industry. A challenge in this area has been to maintain performance across each Wave and we are delighted to be industry leading in the most recent Wave results; we continue to make improvements and focus on getting it right first time and delivering an unrivalled customer service.

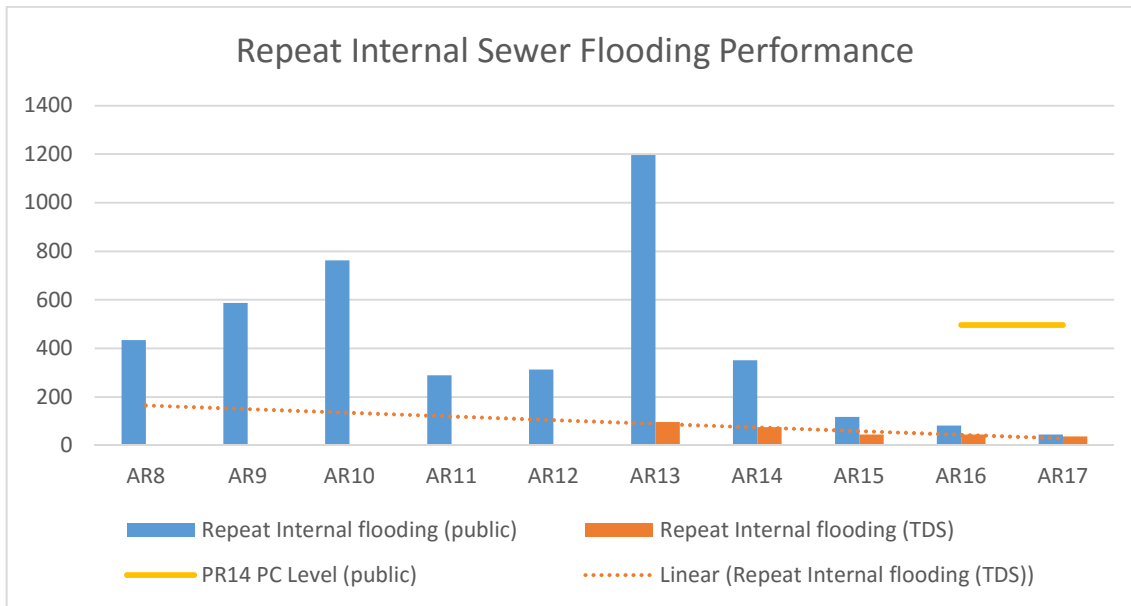


Graph 1: NW Qualitative Waste Water SIM results from Wave 1 in 15/6 to Wave 2 in 17/18

Sewer Flooding

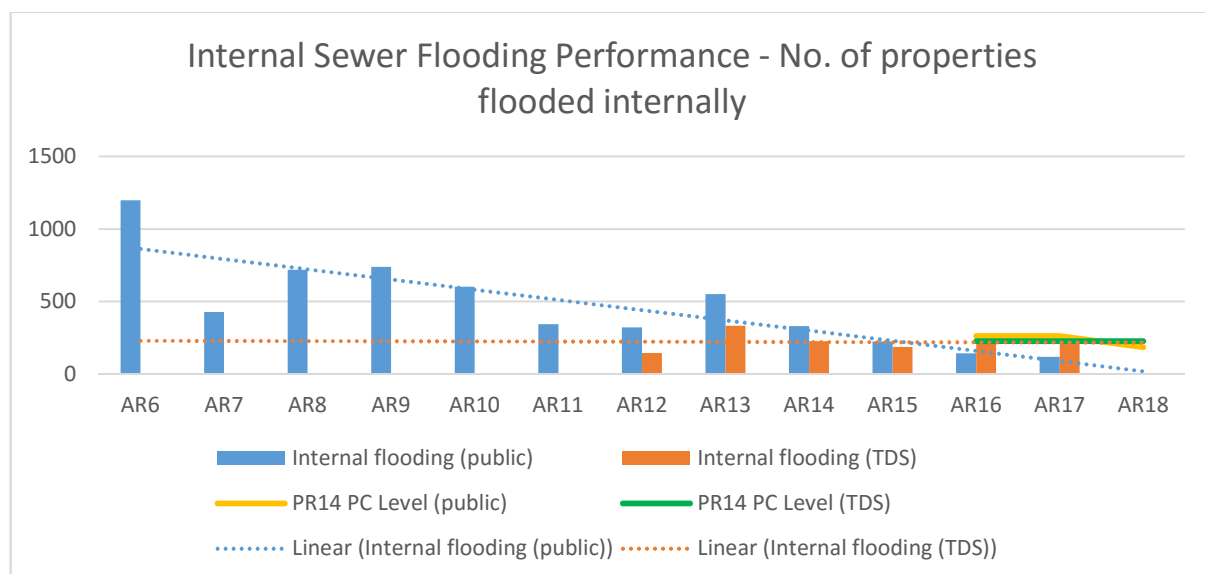
Sewer flooding inside the home is undoubtedly one of the worst experiences our customers can have and reducing sewer flooding remains one of our highest business priorities. We set challenging targets to reduce the amount of sewer flooding and we have improved our performance year on year for many years and have out-performed our AMP6 PC levels as can be seen in Graph 2 repeat internal sewer flooding, Graph 3 number of properties flooded internally and Graph 4 curtilage flooding.

The graphs separately show our performance in both the public network (the sewer pipes we have always owned and managed) and the transferred network (TDS), the network which transferred from private ownership to our ownership in October 2011. This transfer increased our network size from around 16,000km to around 30,000km. We have chosen to separate our performance in this way to transparently demonstrate the differences in trends for both networks.



Graph 2: Repeat Sewer Flooding Performance

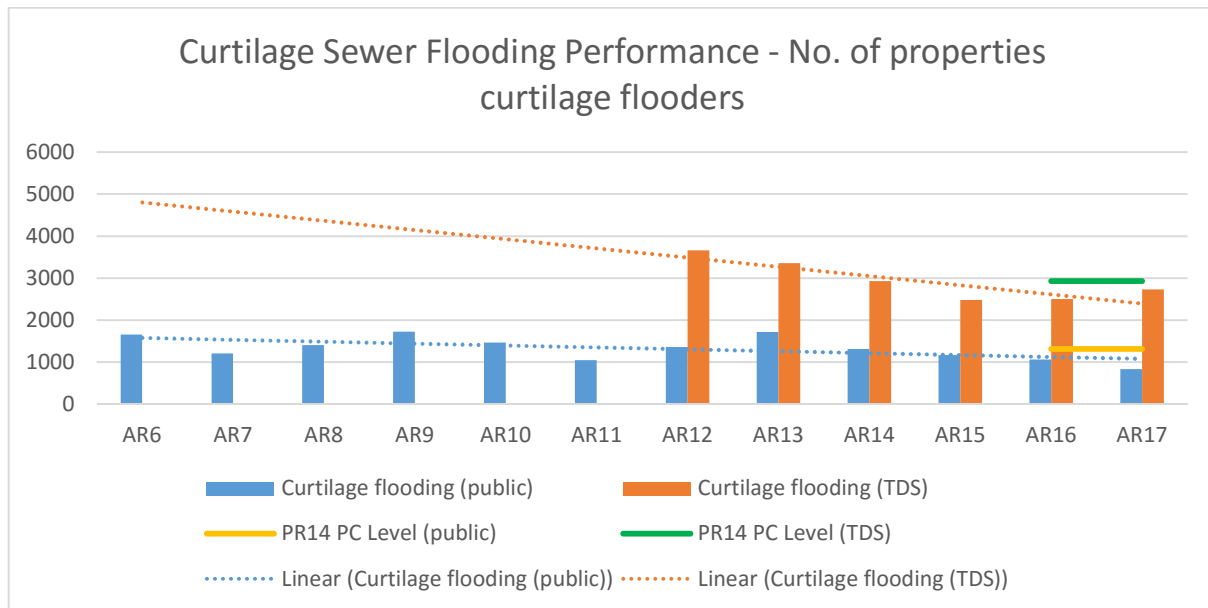
We are the only company who have continued to measure repeat sewer flooding as a customer facing standalone metric. We have improved considerably over the last number of years and we remain committed to continuing this positive trend. We have been influential in an industry-wide sewer flooding convergence group that has developed a comparable internal and external sewer flooding metric. We began development of the metric by understanding what was important to customers therefore the new metric measures the number of *incidents* of sewer flooding rather than the current metric which measures the number of properties, excluding repeat flooding. As a result this new comparable metric will include repeat flooding and therefore we do not propose to carry repeat sewer flooding forward as a standalone measure into AMP7.



Graph 3: Internal Sewer Flooding performance for both public and TDS network

As you can see from Graph 3 & Graph 4 our TDS network is a challenge. We had no knowledge of this network prior to 2011 including much of its location, condition and previous performance, making it difficult to be proactive. The TDS network also tends to be smaller pipes closer to people’s homes so has a greater

chance of blocking. Increasing performance from our TDS network will form a large part of our current business plans and our PR19 plan.



Graph 4: Curtilage Flooding both public and TDS

We have implemented a number of initiatives to both prevent sewer flooding performance and increase the level of service our customers receive when they do flood. A number of these initiatives are highlighted below:

- Northumbria Integrated Drainage Partnership (NIDP) – we led the development of the NIDP, a regional partnership consisting of 13 Lead Local Flood Authorities and the Environment Agency (EA). We developed a pipeline of integrated studies which progress into proactive and reactive flood risk reduction schemes, prioritised regionally to maximise customer benefit. We have been recognised by the EA and other stakeholders as leading in this area with example schemes including Brunton Park and Killingworth/Longbenton.
- Sewer Flooding Leading Improvements Through Employees (SF LITE). This initiative involved developing a project team of employees from all levels in the business, focused on how we could provide the best service possible to customers when they experience flooding. This led to some major changes, for example insourcing previously outsourced CCTV work and decreasing the average investigation time from weeks to days, ensuring customers are informed with regular updates. Our customer journey assessment score for AR17 was 4.87 out of 5.
- Love Your Drain customer behaviour change – Dwaine Pipe has appeared in pantomime, games, books, plays, posters, and on radio with his catchy jingle ‘Only toilet paper, pee and poo go down the loo’. Sewer misuse is a major challenge, over the past three years 83% of flooding contact are as a result of blockages caused by sewer misuse.
- Proactive CCTV and remedial works – hotspot blockage areas were identified and proactive CCTV, cleansing and root cutting was carried out to reduce repeat incidents.
- Blockage Dashboard – our blockage dashboard visually displays areas of high risk which are then targeted through detailed investigation and a focus on customer behaviour change.
- Rainwise – a proactive and reactive risk reduction and customer behaviour change initiative aimed at increasing the resilience of our communities. Rainwise brings together all of our drainage flood risk reduction initiatives including our industry leading and award winning partnership projects. Rainwise provides an identity to customers, building awareness of surface water management and the steps they can take to manage water around their homes and communities more effectively. So far in AMP6 our Rainwise approach has reduced flood risk to over 4,000 properties.

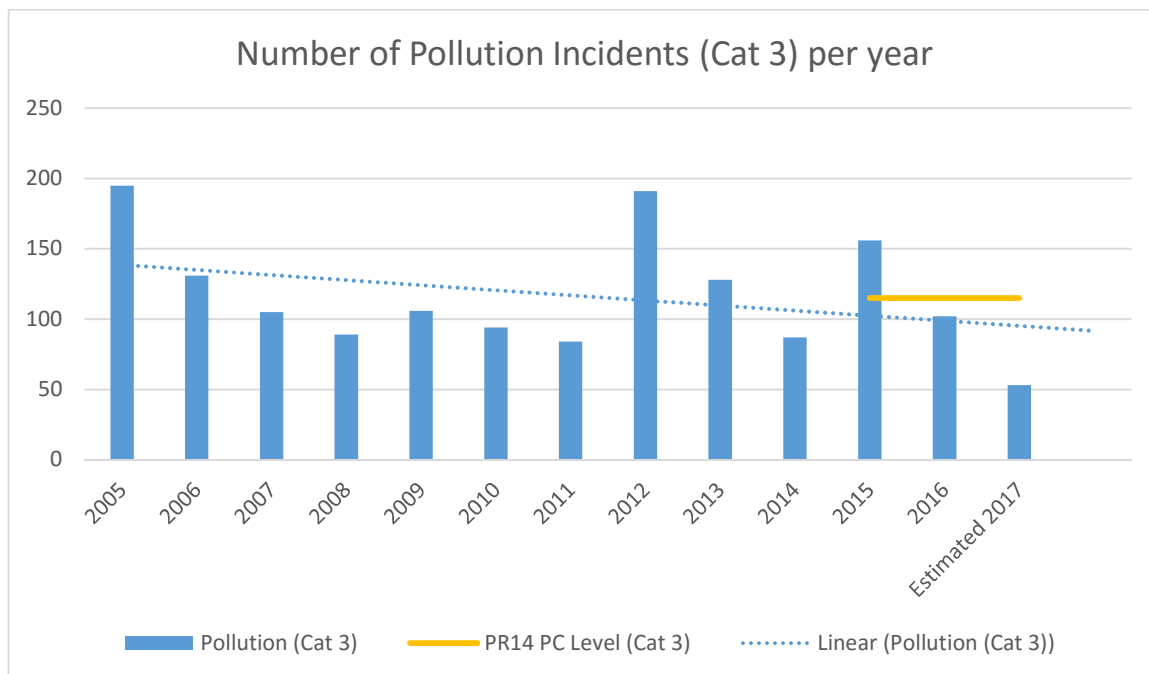
- TDS Mapping – we are using data to *infer* the location of our TDS assets. This is based on patterns of asset location associated with house type and age. We are verifying the network through surveys which further enhance the model. This is a unique approach and is a highly efficient way of mapping our network; this will ensure that going forward we can apply our full proactive approach to our TDS network which has proved effective in driving performance on our public network.

Our biggest challenge for flooding performance is customer behaviour change. We are proud that we are continuing to drive improvements in sewer flooding performance and are out-performing our targets. Discover Water shows our public internal sewer flooding performance is amongst the leading companies however the performance on our TDS network is below average and more challenging and will be a major focus for the remainder of this AMP and for our PR19 plan.

Pollution

We have always had a real respect for the communities and environment around us and reducing pollution incidents is a major focus for us. In support of this, our customers have told us that they expect us to protect and enhance the environment, and our regulators and many other stakeholders have also encouraged us to drive improvements in this area. As well as reducing the incidents themselves, the EA also monitor the percentage of incidents ‘self-reported’ which they use as an indicator of the ability of water companies to manage their assets. Pollution incidents are segmented into four categories depending on the environmental impact:

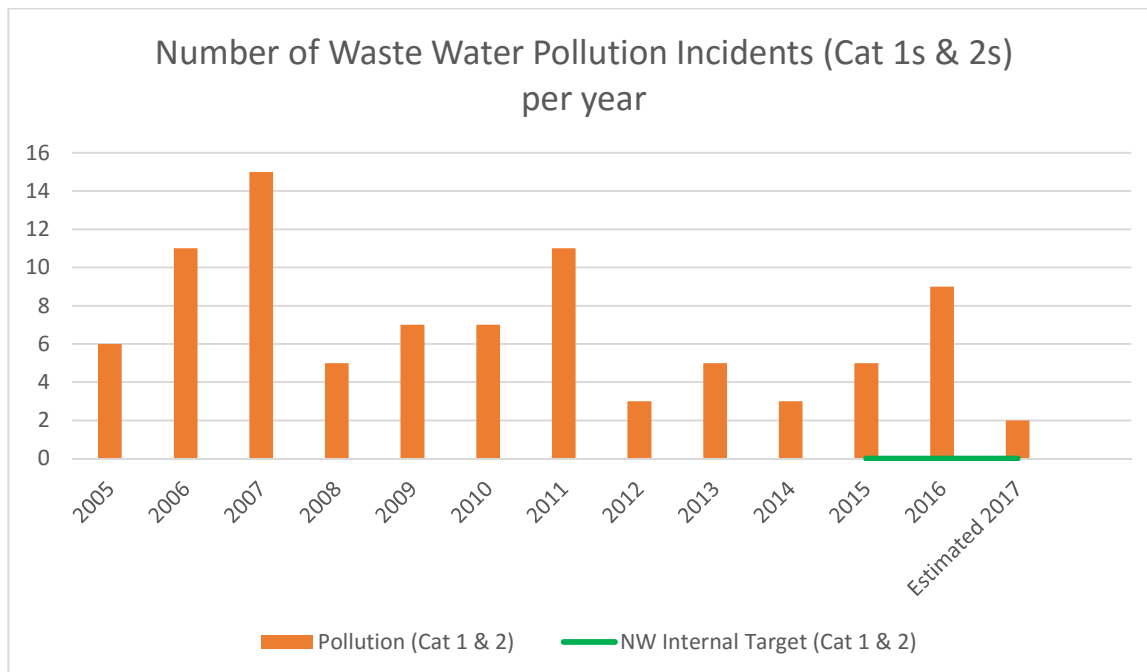
- Category 1 & Category 2 – have significant environmental impact and may end in a prosecution or a proactive Enforcement Undertaking being accepted.
- Category 3 – some minor, normally short term environmental impact.
- Category 4 – no impact.



Graph 5: No of Cat 3 pollution incidents per year

You can see from Graph 5 above that there have been some significant variations in performance over the years, some of which is linked to asset performance and some linked to changes in reporting requirements. We have worked to develop a pollution management plan to increase our pollution performance and drive consistency in our reporting and evidence gathering. This has resulted in a 35% reduction in pollutions last year and we are forecasting a further 40% reduction this year. Some of the initiatives driving this performance include:

- Monitoring – we have a higher percentage of CSOs monitored (97%) than all other companies and will reach around 100% monitoring by the end of this AMP. The majority of our pumping stations are also monitored, with some work required on the newly transferred private stations. This network visibility allows a proactive response to issues before an environmental or customer impact occurs preventing hundreds of potentially polluting discharges.
- Data Analytics – “Trim and Trend” - we have started to take an extremely innovative approach to the data from our monitors, and we are beginning to turn it into trend information, predicting asset performance and triggering a response before an issue has even occurred.
- Organisational restructure – we have restructured our technical support teams creating separate pollution, flooding and reactive teams allowing staff members a dedicated focus on a particular area of activity facilitating a consistently high response to issues.
- Process consistency and partnership – we are proud of our partnership approach with the EA and we have together developed a process with our local EA office to drive consistency in our reporting of potential pollutions and in the evidence we supply to the EA to categorise pollutions. This is an approach our local EA office has described as leading, and we believe it demonstrates to our regulators and our customers that we are an ethical, open minded and trustworthy organisation.
- Harnessing the power of our customers and communities – through our unique and award winning Water Rangers scheme we are working in partnership with customers to walk sections of river back and notify us of issues with our network. This initiative has grown organically and as well as reporting issues with our own assets, our Water Rangers notify us of issues as diverse as fly tipping and the presence of invasive species which we can bring to the attention of our catchment partners or regulators.



Graph 6: No. of Cat 1 and Cat 2 pollution events per year

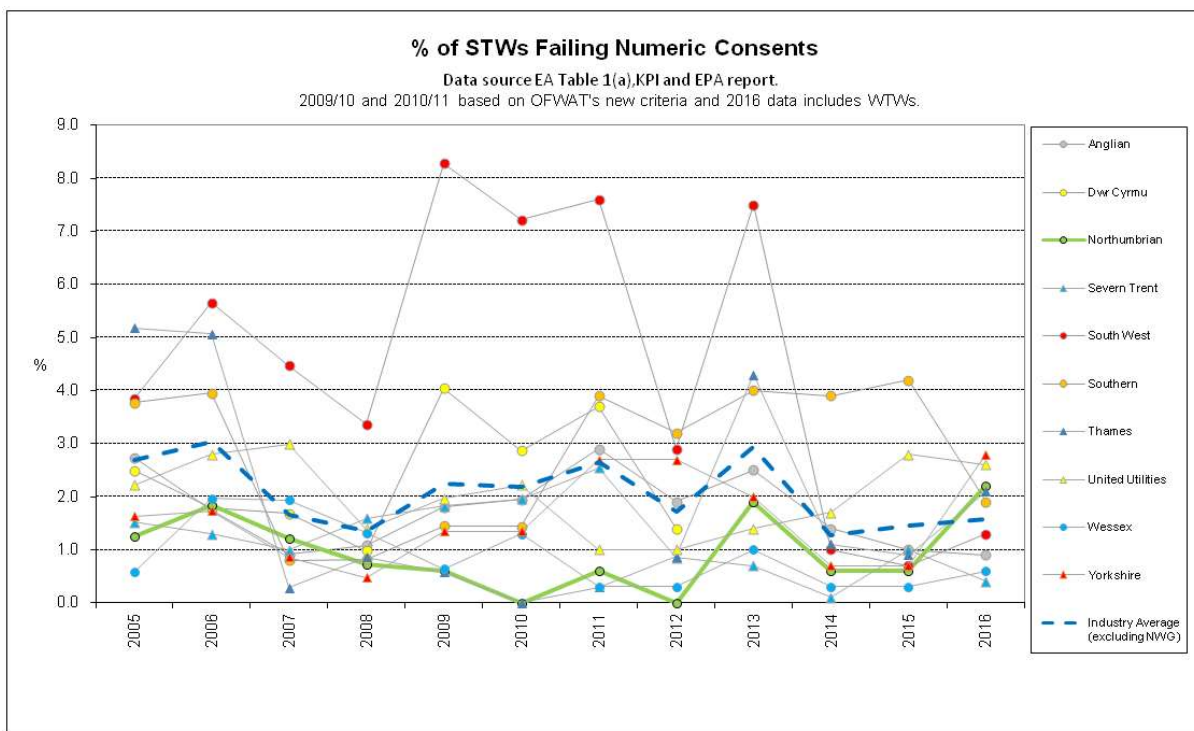
Graph 6 shows the number of waste water related Category 1 and Category 2 pollutions per year. It excludes water service related pollutions, of which there are unusually two during 2017, both one-off events; our waste water and water teams are working closely together and sharing best practice. We are disappointed in our Category 1 and 2 pollution levels in recent years as shown in Graph 6, particularly the 2016 performance, and we are committed to improving in this area. We have learned many lessons from 2015 and 2016 and have included these lessons in our pollution management plan which we are confident is resulting in a step change. We have not had a Category 1 or 2 event since May, and our forecasted performance for Category 3 events in 2017 will be our best ever performance and is well below our AMP6 Business Plan performance commitment levels as demonstrated in Graph 5.

We also in 2016 had our first Enforcement Undertaking (EU) for a Category 2 event at West Wylam in 2015 successfully approved; an EU is a form of civil sanction which allows an organisation to propose a proactive undertaking to make amends following an issue, through financial and other means, typically supporting environmental enhancements in the original area affected and perhaps beyond. If approved then this replaces any potential prosecution process that may have been followed. We are proposing a number of other EUs for Category 1 and 2 events in 2016.

The percentage of Category 1-3 incidents we ‘self-report’ rather than be reported by another party such as the EA or a member of the public, is monitored by the EA as an indicator of our awareness of our asset performance how well we are managing our network. Our self-reporting for 2017 stands at around 70%.

Sewage Treatment Works Discharge Compliance

We are proud of our underlying performance in this area, having been amongst the industry leaders for this measure over the past decade and having achieved seven years’ worth of zero STWs against one of the EA measures known as ‘look up table’ from 2007 to 2014. This required continual improvement as many consents were tightened over that same period. Sewage treatment works discharge compliance is complex and contains different measures driven by different pieces of legislation. Graph 7 shows Company comparison information associated with treatment works discharge compliance and illustrates that we have typically been amongst the leading companies in this area.



Graph 7: Company comparison information

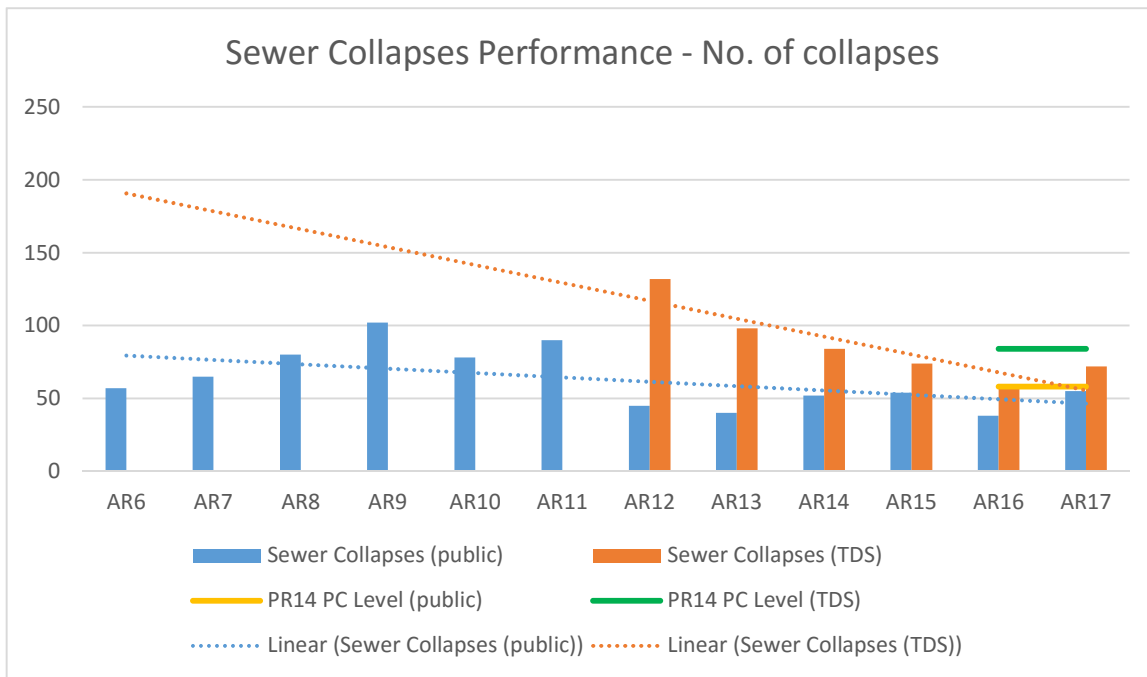
Our performance has been driven and underpinned by:

- TRIM (Trigger Management Process) which uses Data Analytics to bring about early warnings, continuous improvements and marginal gains. It is a system we developed to suit our business, using techniques and systems we observed from exemplar organisations beyond our sector, typically from manufacturing industries. It ensures an escalation process to bring about resolution to minor level issues or declining trends, identifying operational or investment interventions to prevent the occurrence of more significant issues.
- Operator Ownership and Competency and use of TRIM driving operational interventions.
- Zero Tolerance ‘culture’ with respect to plant performance issues and plant failure.
- Rapid investment interventions when poor performance is spotted.

- Better trade effluent control.
- It is notable that we do this very efficiently with one of the lowest headcounts in the industry.

Sewer Collapses

Sewer collapses is a measure of Asset Health and we have been leading in this area for a number of years. Graph 8 illustrates a year on year improving trend below shows that we have typically been improving performance on this measure year on year and are still out performing our performance commitment levels for AMP6. We recognise that maintaining and improving our waste water network is important to customers as it increases the robustness and resilience of our assets and reduces the risk of pollution and flooding. It is also a leading indicator and demonstrates to our customers we are effectively managing our assets for the long-term.



Graph 8: Sewer Collapse Performance

Bathing Water Quality Compliance

There are thirty four designated bathing waters in the NW operating area stretching from Spittal Beach in the north to Saltburn in the south.

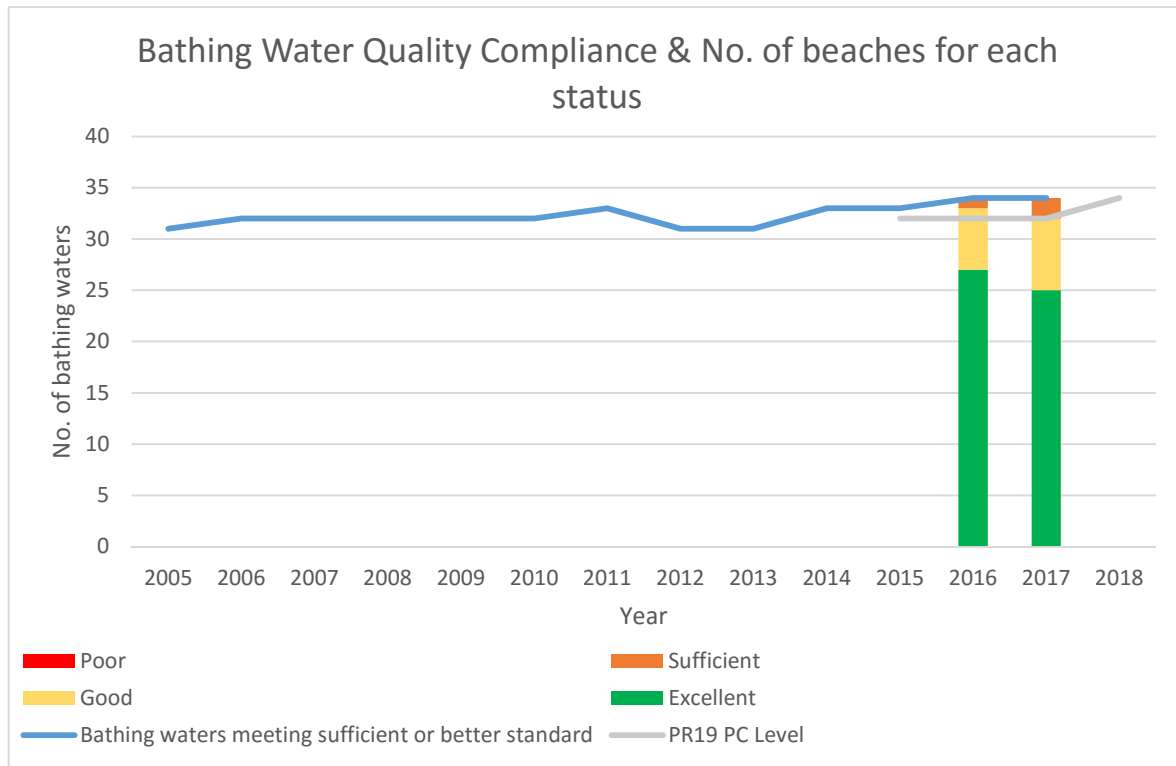
We have invested significantly to increase our performance in areas such as:

- bathing water schemes, essentially large storage volumes, to reduce the impact of storm discharges;
- UV radiation treatment at STWs where our discharges were considered to impact performance. NW has more UV than any other WC and has the industrys’ largest plant installed at Howdon STW; and
- much of this work improves bathing water performance as well as providing improvements to asset health with an associated reduction in flood and pollution risk.





Our performance commitment measure is to ensure that 33 of our bathing waters achieve a sufficient or better category and in 2016 all 34 beaches attained sufficient or above, see Graph 9. In fact 33 (97%) of our beaches achieved excellent or good status which was the highest level in the industry. The 2017 bathing season has just finished and again all 34 have met the sufficient standard or above, with 32 (94%) achieving excellent or good status which we expect to be at or close to leading when figures are shared later this year.



Graph 9: Bathing water quality compliance

A big challenge with this measure is that NW assets are not the only contributing factor to the status of a bathing water. Highway drainage, agricultural run-off and many other factors all play a part. We are committed to sustaining this excellent performance and are continually looking for potential improvements working in partnership with Local Authorities, the EA and coastal partnership groups.

**Bio-resources**

Bio-resources (which people used to refer to as ‘sludge’) is the by-product from our sewage treatment processes and was previously considered as an expensive waste, but is now a valuable fuel.

Prior to 1998 all our sludge was disposed at sea, before this practice ceased and the ‘sludge’ was processed through a drying operation at Bran Sands on Teesside and lime stabilisation at Howdon on Tyneside. The resultant products were recycled back to the environment via agriculture as a fertilizer. The drying process used large volumes of natural gas making it very expensive and the lime product was very odourous.

In 2005, we began to explore alternatives and looked at the advancements in anaerobic digestion a process that had been around for many years but was never viable on a larger scale. These advancements centred around subjecting sludge to a Thermal Hydrolysis process prior to the anaerobic digestion, a bit like pressure cooking the sludge. We also looked at the way we moved sludge around the region as a solid rather than a liquid. This changed the way we looked at our overall sludge strategy. We invested in two Advanced Anaerobic Digesters, at Bran Sands in 2009 and Howdon in 2012, along with five regional dewatering sites to condense the sludge and reduce transport costs. Sludge became regarded as a fuel to generate power from the biogas produced rather than just a costly waste.

Then in 2014 we added a gas clean up plant at Howdon which now injects biomethane directly into the grid and we plan to build a similar plant at Bran Sands this AMP. The AAD and gas plants represent more than £100m of investment.

We are unique in that 100% of our sludge is used to generate power; 6MW of electrical energy and 15MW of biomethane every hour is now produced from these sites via combined heat and power engines (CHP) and our biomethane production plant, both of which benefit from Government Incentives (Renewable Obligation Certificates ROC and Renewable Heat Incentive RHI) which were an important part of the business case for such a major investment.

AAD using thermal hydrolysis gives a very safe product by killing all pathogens under the extreme temperature and pressure applied and as a result 100% of our sludge is recycled to land without any material odour.

Ofwat benchmark the industry and their figures show us to be the most efficient water company under this price control. This leaves us well placed to succeed in the new bio-resources market that Ofwat is seeking to create and indeed we have been regularly managing bio-resources from other companies' sites in recent years when they have suffered operational issues.

## **CUSTOMER ENGAGEMENT**

### **Summary of recent research findings**

We carry out customer engagement continuously throughout every AMP to inform our policies and strategies. A summary of the recent waste water customer engagement findings is provided in Appendix 1. The summary contains information relating to:

- The future of combined sewer overflows.
- Sewer ownership and responsibilities.
- Flooding response.
- Resilience.
- Service perceptions, measures and priorities.
- Understanding and communicating risk.
- River water quality.
- Bathing waters.

### **Developing our Waste Water PR19 plan**

We wanted to ensure we developed our Waste Water PR19 plan with our customers and our partners at the heart of our decision making therefore we developed an innovative approach to our plan creation. To develop our proposals we held PR19 waste water sprint. A sprint is a design concept created by Google which brings multi-disciplined experts together to develop robust and innovative strategies, ideas or concepts in an efficient manner. We gathered together a multi-disciplined group of subject matter experts from within NW and from our external partners including CCWater, EA, Tees Rivers Trust, Regional Flood and Coastal Committee and the Tyne Catchment Partnership. To ensure we kept customers' voices at the forefront of our thinking we started by understanding the outputs from the customer research associated with the waste water service and created an expectation chart showing what customers and partners expect from us. As we developed ideas we continually returned to the expectation chart to ensure the strategies and ideas we created aligned with our customers' and regulators' expectations. Our critical friends reinforced our customers' voices through challenge and debate. We developed proposal papers categorised into eight themes containing innovative ideas on how to achieve our customer and regulatory expectations alongside our own vision to be the national leader in the provision of water and waste water services. An artist captured our outputs each day below and her illustration of our work is seen in Figure 2.



Figure 2: Illustration of the outputs from the PR19 Waste Water Sprint

Our proposals were co-created and challenged by customer and partner representatives and built on the foundation of previous customer research. However we wanted to further strengthen our customers' voices so we took our proposals to the Innovation Festival and tested them with four customer focus groups. Our customers broadly supported the direction of our strategies and were surprised by the extent of the service we covered. Their ideas and challenges have been incorporated into our plan.



As well as ensuring we place a strong emphasis on customer engagement we also wanted to place a strong emphasis on partnership engagement. We are in a unique position, having over many years developed strong and industry leading partnerships and have led the development of regional approaches to reduce drainage flood risk reduction. We wanted to build on these partnerships and begin to integrate our approaches to provide multiple benefits to customers in an affordable way. We held catchment 'thinking ahead' workshops which focused on understanding overlapping objectives and how we could deliver these objectives more effectively in partnership. We analysed the main themes from these catchment workshops and held a regional 'thinking ahead' workshop, chaired by one of our Board's Independent Non-executive Directors, to solidify our regional approach and agree a way forward. Our 'thinking ahead' workshops engaged over 50 partnership groups and the themes and ideas have been incorporated into our plan.

We have used customer and partnership engagement to create our PR19 waste water strategy which forms the core of our waste water business plan. We are continuing to engage and co-create our plan with customers and partners as we believe this will help us to create an ambitious, innovative and customer centric waste water approach. We are currently developing a summary our plan which sets out our main themes and ideas. We have provided an early draft version of this plan below for your perusal which we

hope will give you an insight into the plan, demonstrate how customer and partnership engagement has shaped it and form the basis for our discussion at the Water Forum on November 1.

### **PR19 Waste Water Plan Executive Summary**

Note: This is a working draft of an executive summary of our PR19 Waste Water Plan, which will continue to be refined and worked on in the coming months.

#### Delivering a resilient waste water service

Following a comprehensive programme of customer and stakeholder engagement, including a series of innovative workshops bringing together a diverse range of our partners - the PR19 Waste Water Sprint, the NWG Innovation Festival and our Regional 'Thinking Ahead' Workshop - we have identified proposals that respond to our customers' priorities and concerns. These include a number of **ground breaking objectives and frontier shifting goals**.

Ofwat recognise that taking an **Integrated Approach** is key to delivering resilient water and waste water services. Knowing that this is the right thing to do, that it can have many benefits for us as a business, and anticipating regulator support, we have developed our own Integrated Approach for NWG over the last 18 months. This requires the business to adopt a joined up way of thinking about issues, and consider integrated solutions to manage issues, minimise environmental impact, and deliver multiple benefits. Adopting this approach will underpin our approach to meeting our challenges during PR19 and beyond, cutting across our waste water themes.

Our customers have told us that sewer flooding is the worst service failure they can experience, and they have also told us that they value the environment and believe that we should be working in partnership to protect and enhance it. Taking this feedback on board, our Waste Water Strategy builds on the following three themes:

#### Customer participation

The strategy includes a number of proposals that directly relate to customer participation, in terms of the manner in which we participate with our customers and the manner in which our customers interface with our assets. These proposals follow the 'FACE' framework for customer participation created by Ofwat (futures, action, community, experience).

Our customers will have a number of choices to make regarding the wider environment that will compete with available choices across other areas of our activities. We recognise that some customers may wish to contribute further to the wider environment through their water bill, and for those customers we propose to create a **green fund** that will support the wider environment and enable our customers to participate in the sector's future. Customer participation in our work to improve the water environment will be complemented by working in partnership throughout our wider environment proposals to lever additional funding, thus broadening the scope of our activities in this area.

Increasing customer action to improve the resilience of our waste water assets will be addressed through a programme of behavioural change proposals, including education and incentives, which will target a number of critical areas such as misconnections, sewer misuse and property-level surface water management. This element will be closely linked with our proposals to increase community ownership, in a similar way to what we have achieved with Water Rangers and participation, whereby we will build upon our industry-leading sustainable drainage partnership project, Rainwise, and implement measures to create resilient communities that are empowered to respond effectively to flood events. These proposals will all contribute towards the achievement of an UQ position for sewer flooding and pollution.

Finally, we will enhance our customer experience offer by **reducing our response time to internal sewer flooding incidents from four hours to two hours and external sewer flooding incidents from a same-day response to four hours**. This enhanced service will be supported by proposals to further reduce our response time to incidents reported by customers included on our Extra Care register to two hours. Together these measures will assist in the attainment of consistent upper quartile (UQ) CMEX performance.

We will further develop our customer strategy to deliver an unrivalled customer experience across the diverse range of developer customers, offering a streamlined and tailored whole development life cycle contact. Our D-Mex Strategy is built on feedback that we have received and aims to offer a **sterling service which is beyond legislative requirements as contained within our Developer's Charter.**

#### Working in partnership

Across our waste water activities, we will **work in partnership to provide an improved customer service and an enhanced and sustainable water environment to support the needs and aspirations of the region and demonstrate national leadership.**

The principles of this objective will be applied to a number of specific proposals, including building upon the excellent innovative work we have established with the Northumbria Integrated Drainage Partnership and expanding this in to a regional fully integrated drainage plan. In addition, we will work with our partners to develop a multi-agency response to incidents to ensure the most appropriate resources are in attendance. We believe that this proposal would extend and enhance our already leading strategic approach to bring about greater resilience and better flooding performance.

Our ambition to work in partnership links to the commitments made within the waste water strategy relating to Environmental Performance Assessment, Water Industry National Environment Programme and a bespoke performance commitment to deliver improvements on the ground to Water Framework Directive waterbodies.

Furthermore, we will expand our existing partnership work with our developer customers to incentivise sustainable surface water management and proactively identify growth-ready development sites that we will promote in terms of waste water capacity, which will allow us to support the region's economic growth ambitions without delay.

#### Fit and healthy asset base

Proposals relating to our asset base can be categorised into the physical health of assets and the data we have to ensure their efficient operation and management. Our strategy provides for the maintenance of physical asset health into the future through investment in areas such as sewer cleansing, sewage pumping stations and TDS rehabilitation, which will assist in achieving UQ for sewer flooding and pollution measures. We will also **further increase our treatment capacity in the Howdon sewage treatment works catchment** which will require significant investment to respond to longer term challenges by upgrading existing facilities and / or considering alternative facilities as part of our resilience strategy.

Furthermore, our investment in physical asset health will be supported by **the provision of an intelligent network in the Tyneside area** which will provide real-time intelligence and control in one of our most complex drainage areas that is particularly vulnerable to long term pressures of growth, climate change and sewer misuse, in addition to extending capacity at Howdon treatment works in the shorter term. The delivery of the intelligent network will be facilitated by the development of our existing work in this area, including monitors at key network locations including combined sewer overflows, the drainage area studies and SNIPER, our industry leading predictive monitoring tool, all of which move us closer to real time control on the network and again contributing towards the delivery of UQ sewer flooding and pollution performances.

Finally, we will maximise the efficiency of our waste water services and enhance the value for money provided for customers by transitioning into a leading bio-resources market business whilst improving and enhancing the environment. This will require further investment at both of our regional treatment centres to increase our digestion capacity.

#### Summary

The Waste Water Strategy is ambitious and stretching. It aims to build on our strong position whilst addressing the performance areas to enable us to achieve as a minimum the UQ position.



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## **SUMMARY OF RECENT WASTE WATER CUSTOMER ENGAGEMENT FINDINGS**

We carry out customer engagement continuously to inform our policies and strategies. This paper gives high level findings of waste water customer engagement, which will inform our PR19 Business Plan. Water Forums members can find all of the final reports for this engagement in the 'research and engagement information' section of Sharepoint.

### **The Future of Combined Sewer Overflows (CSOs)**

*Qualitative engagement (two deliberative events, 15 non-household interviews)*

The customers who participated in this research began from an informed perspective where they were not aware of the need for, or the operation of, CSOs. After information was given, bringing customers to a more informed perspective, they supported CSOs but expected that the Company would reduce spills and look for alternatives in the future.

Further findings:

- Participants are not against CSOs in principle, but nor do they know of any alternatives.
- CSOs are an acceptable solution to heavy rainfall but should not be used routinely. Participants felt that operating a CSO more than once a month is indicative of an issue with system capacity.
- We are trusted to operate CSOs under the right circumstances (eg heavy rainfall).
- The prevention of flooding to homes and business premises should be prioritised over the environment, due to financial and emotional impacts.
- Participants expect regulation around CSOs to be tight.
- Participants were supportive of our monitoring and planning approach, specifically after seeing how we compare to other waste water companies.
- Participants were surprised by the frequency of spills and want the highest spillers reduced.
- Participants want us to educate customers about the correct use of sewers. This is something that comes out consistently across all our waste water research.

### **Sewer ownership and responsibilities**

*Quantitative survey (a representative sample of household customers, 15 non-household interviews)*

Customers have a limited understanding of sewer ownership and responsibilities. When we asked customers to indicate which parts of the sewer network they were responsible for 72% admitted their response was based on guesswork. Few customers (14%) were aware of the transfer of drains and sewers which happened in 2011.

Further findings:

- Less than 1 in 10 household customers have done any maintenance work on their drains and sewers in the last five years, and even fewer non-household customers have done so.
- 15% of customers have had an issue with drains or sewers at their home in the last five years (mostly slow flows and bad smells caused by blockages). 80% of these issues were on their private sewer section.
- A third of customers contacted their council and half contacted Northumbrian Water (NW) about issues on drains and sewers owned by NW.
- 17% of household customers have insurance for their private drains and sewers – even fewer non-household customers do.
- Customers in vulnerable circumstances in terms of their health or financial situation were much less aware of the correct ownership and responsibility. Home owners were slightly more aware and those living in flats were least aware. Non-household customers are more likely to be aware.

### **Flooding response**

*Qualitative engagement (two focus groups and six NHH interviews, plus 15 future customers)*

Participants had low awareness of both traditional and sustainable urban drainage schemes (SUDs). When informed about both participants supported either approach, but preferred SUDs for the perceived additional

benefits of improved wildlife, scenery and recreation. Participants also expect SUDs to be lower cost. There were some uncertainties expressed as to the effectiveness of SUDs. Future customers in particular doubted that sustainable schemes could cope with severe weather events, favoring the reliability of traditional approaches.

Further findings:

- Participants were asked how we should prioritise the protection of different parts of the community. Protecting access to emergency or essential services (eg hospitals and schools) was the highest priority. Next participants felt homes and businesses should be protected, because of the financial and emotional impact of flooding.
- Participants expect us to work in partnership where mutual benefit can be achieved.
- Participants expect us to balance investment between our reactive approach to flooding and schemes to prevent flooding in the future.

## **Resilience**

*Qualitative engagement (four workshops with 125 customers, breakfast workshops and telephone meetings with stakeholders)*

Findings:

- Participants described resilience as a strong, reliable service that can stand the test of time, cope with change and bounce back from difficult situations.
- Participants were asked to discuss their trust in the Company to maintain a resilient services. Highly satisfied customers who had not experienced a service failure were the most trusting. Those who had experienced service problems, questioned our commitment to ensuring their services are resilient.
- Participants expect us to be prepared for unexpected events and responsive when they occur.
- We are expected to undertake preventative measures such as investing in infrastructure and new technologies.
- Stakeholders had a greater understanding of the work required to make our services more resilient and were interested in developing plans with us.

## **Service Perceptions, Measures and Priorities**

*Qualitative (six deliberative events and in-depth, in home interviews with customers in potentially vulnerable circumstances)*

Findings:

- Most participants had never experienced an issue with their water or waste water service. Those who have experienced an issue typically receive a prompt response.
- Perceptions of NW/ESW's performance are usually based on customers' firsthand experience or hearing about experiences from others, rather than technical or corporate measures.
- No-one had previously sought performance information out and most are unlikely to read it if it's communicated via the bill.
- Many NW participants were unaware that we contribute towards bathing water quality. This revelation had a positive effect because they had a high degree of pride in their coastline.
- Participants felt it is most important for NW/ESW to do well in things that can impact on them, bathing water quality, pollution and flooding.
- Only some customers saw environmental performance indicators like pollution and emissions as important. However, customers struggled to understand these measures so may rate them higher with greater understanding.



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## **Understanding and communicating risk**

*Qualitative (eight workshops with customers and in-depth, in home interviews with customers in potentially vulnerable circumstances)*

Findings:

- Most customers had not experienced any issues (nor know anyone who has). Therefore, the risks of most water and sewerage related events happening are not 'top of mind' and are assumed to be very low.
- Customers most frequently cited population increases, climate change and ageing infrastructure as issues for water companies to tackle. Customers expect water companies to be managing and planning for many of these issues already.

## **River Water Quality**

*Qualitative (two workshops and 15 interviews with NHH customers)*

Findings:

- Participants see rivers as an important part of the history of North East England, which are essential for the environment and provide good things for people to do in their spare time.
- Participants thought that people negatively affected river water by fly tipping, littering and vandalism. Businesses and industry were also seen as responsible for causing pollution to rivers - although some felt that this had much improved because of stricter regulation and because the types of industry near rivers had changed. Farming was also seen to play a part because of chemicals being washed by rainwater into rivers from fertilizers, feed and sheep dipping. Some people also saw householders as damaging river water by flushing the wrong things down the toilet, (eg wipes) or the sink (fat and chemicals).
- When asked how they would like to see river water quality improve, many customers said they would like to see litter free river banks, more wildlife and fish, improvements to the sewage system and a better facilities and access when they visit rivers, to benefit residents, attract more visitors and help boost the local economy
- After customers had been told about the river water quality situation, many wanted more work to go into preventing further damage to rivers, because they thought prevention would reduce the need to clean up the mess created. Customers suggested:
  - Cracking down on polluters (making them pay).
  - Improving the sewer network.
  - Lobbying the government to force companies to reduce chemicals in household products.
  - Telling people about what should not be flushed down the loo or tipped down the sink.

## **Bathing Water Quality**

*Quantitative and Qualitative (671 face-to-face surveys, on beach interviews, 400 online surveys)*

Findings:

- The quality of sea water is assumed to be fine and is a 'given'. Other aspects are much more important in the decisions to visit specific beaches ranging from facilities, such as parking; cafes; fish and chips; ice cream parlours; the ambience which can include scenery and the sense of space; physical aspects, such as if sandy or pebbles (with those that strongly favour one over the other); or if lots of seaweed and cleanliness (eg lack of litter, graffiti, dog mess). All these factors contribute to a sense of how nice a beach is, which extends to the quality of the water.
- Participants ranked 12 different factors as to why people may visit a beach in the UK. The cleanliness of sea water ranked fifth out of twelve factors, being just above average when compared in terms of relative importance to other factors. Still important but in relative terms less so than the four factors above it.
- The importance of a beach having a blue flag award or similar is in relative terms quite low in any decision making compared to other factors. Convenience and location are much more influential along with one's own perception of how clean the water is when compared to the importance of any official rating flag or award.