

**RESPONSE TO THE
GOVERNMENT'S
CONSULTATION ON THE
STORM OVERFLOW
DISCHARGE REDUCTION
PLAN**

12 MAY 2022

INTRODUCTION

We welcome the opportunity to respond to the Government's Storm Overflows Discharge Reduction Plan consultation and the opportunity to help shape the wastewater system for the 21st Century as we work constantly to protect and enhance the environment. We support the ambition to improve water quality in rivers set out in the consultation, but we found ourselves needing to respond neutrally to the questions as the subject is complex and we would not want our detailed responses to be over-simplified into a one-word response.

As a business which has a vision of being the leader in the provision of sustainable water and wastewater services, our commitment to the environment runs through the heart of what we do. This commitment is much greater than simply taking water from the environment and restoring it back. Making sure we protect and enhance the environment in everything we do is part of our culture as a company. We work continually to protect public health in abstracting, supplying, and treating water, often going beyond our regulatory obligations. [Our purpose](#) is caring for the essential needs of our communities and environment, now and for generations to come. We do this by providing reliable and affordable water and wastewater services for our customers. We make a positive difference by operating efficiently and investing prudently, to maintain a sustainable and resilient business.

In our [Business Plan for 2020-25](#) we set out several ambitious goals which will improve the environment that we all rely on. These are to:

- Have the lowest levels of leakage in the country in our water stressed Essex & Suffolk Water operating area.
- Have a per capita consumption (PCC) for water use of 118 litres per person per day by 2040.
- Promote confidence in our drinking water so that nine out of ten of our customers choose tap water over bottled water.
- Have zero pollution incidents as a result of our assets and operations.
- Have the best rivers and beaches in the country.
- Demonstrate leadership in catchment management to enhance natural capital and deliver net gain for biodiversity.
- Be leading in the sustainable use of natural resources, through achieving zero avoidable waste by 2025 and being carbon neutral by 2027.

We are well on the way to achieving our ambitious goals. For example, with 32 out of 34 bathing waters in our North East region classed as Excellent or Good, while our record on preventing pollution is industry leading with the lowest number of total pollution numbers since 2017. We have achieved a Four-Star performance, the highest possible, in the Environment Agency's latest Environmental Performance Assessment and we expect to maintain that standard when the 2021 results are announced this summer, as well as in the years beyond that.

In our [Vision for our Coast and Rivers](#), we set out our current and future plans including environmentally expressing our passion and how we plan to meet the expectations of the public and our customers and enable our region to benefit from the best rivers and beaches in the country. It takes on the challenge our customers and communities have set for us - demonstrating that we are acting now to make a difference and planning for a step change in our water environment. We are committed to the following nine ambitious pledges that we believe will be effective for our unique water environment and make a real difference to our communities:

1. We will work with the Environment Agency, Natural England, The Rivers Trust and Catchment Partnerships to identify, and have plans in place to eliminate, all impediments to our rivers achieving good ecological status caused by our operations.
2. We will invest in monitoring to provide 100% near Realtime Data on all Storm Overflows by 2023.
3. We will introduce final effluent, in-river upstream and downstream monitoring to get a greater understanding of environmental impacts of treated water by 2030.
4. We will implement Water Quality monitoring at the highest priority Storm Overflow locations by 2025.
5. We will reduce spills from storm overflows to an average of 20 per year by 2025.
6. We will work closely with The Rivers Trust through our strategic partnership and North East Catchments Hub to focus on river needs for investment through catchment and nature-based solutions, and to identify at least 2 inland bathing water sites where applications for designation can be made at the earliest opportunity. We are proud that already 95% of the NE population lives within an hour's drive from a beach with Good or Excellent bathing waters.
7. We will work with partners to achieve 100% of coastal bathing waters at Good or Excellent by 2030.
8. We will work in partnership to improve 500km of blue spaces (such as river banks and accessible water environments) for the public to enjoy in our regions by 2030.
9. We will double the number of our Water Rangers – our citizen scientist volunteers who are trained to help us monitor environmental conditions around rivers and take action to address wider river issues such as littering, fly tipping or signs of pollution.

For many people, living differently during the pandemic refreshed a public connection with the natural environment. We recognise that for some of our customers our rivers and coastal waters are becoming increasingly important, and for them discharges from storm overflows (SOs), particularly where they may cause harm or impact public health, isn't a long-term acceptable solution. We want to offer reassurance that we are committed to meeting their expectations so that SOs in the future only spill at an agreed level, for example during heavy rainfall and we play our part in improving rivers and coastal waters.

We also recognise that reducing the harm caused by discharges from SOs is not the only important consideration for our customers. They are facing a cost-of-living crisis at the same time as the water sector faces a variety of investment pressures – including from environmental drivers such as achieving Net Zero greenhouse gas emissions and addressing the impacts of climate change. In recent research tracking public concerns and priorities over time by Ipsos MORI inflation was identified as the most or an important issue for adults in Great Britain today by 32% of interviewees, while pollution, the environment and climate change was fifth, being mentioned by 13%¹. This is important in the context of the potential bill impacts of addressing SOs, which could add £174 to £1,042 per year, per household to average bills by 2050. This would result in real term bills rising from their current level of £365 to as much as £1,407 – an increase of 285%².

¹ ['Issues Index'](#), Ipsos MORI, April 2022.

² Based on our analysis of the impact on Northumbrian Water's average bill of an additional £4 billion to £24 billion of investment. Our analysis shows this impact is the same order of magnitude as our share, by number of SOs, of the full range of capex costs of £1.9 billion to £23.2 billion, from ['STORM OVERFLOWS EVIDENCE PROJECT – 2022 ADDENDUM'](#); Stantec, March 2022, which would increase average bills by £82 to £1,007 per year, per household. The increase referenced in our [Vision for our Coast and Rivers](#) of £50 to £300 is based on the central case from this report.

Because of this we consider that while protecting our rivers and beaches is of utmost importance, we must take a best value approach to do so. Maintaining affordability for our customers, and hence their backing for environmental expenditure, is paramount so that we can reduce the harm caused by discharges from SOs alongside delivering our other environmental objectives.

We therefore support the ambition of the new national targets set out in the consultation as they provide a clear direction. However, we consider targets focussed on reducing the harm caused by SOs rather than the number of spills would deliver better outcomes for the environment – including making Net Zero more deliverable – while better supporting affordability. We need to ensure that whatever targets we set deliver the right environmental outcome in the round. Protecting rivers by providing treatment to rainwater using concrete, chemicals and power may not be the best answer. Solutions should therefore have a proper environmental assessment to avoid unintended consequences.

Either approach to target setting will require significant and complex investment to deliver. This will necessitate the need for system-wide integrated planning and solutions involving many different actors, such as highways authorities, developers, planning authorities and flood risk managers. As part of this we welcome the Government's commitments in streamlining the planning process and in assessing the legislative changes recommended by the Storm Overflow Task Force (SOTF) in improving rainwater management.

Our detailed responses to individual questions and the overall actions in the consultation are contained in the sections below. Please contact at ExternalCommunications@nwl.co.uk should you require any further information.

ABOUT OUR WASTEWATER SYSTEM

Our wastewater system is complex – we manage more than 30,000km of sewers, over 1,000 sewage pumping stations, 410 sewage treatment works and more than a million manholes across our region. We treat around 900 million litres of wastewater every day in serving our 2.7 million customers who live in the major population centres of Tyneside, Wearside, and Teesside as well as the large rural areas of Northumberland and County Durham.

Our sewerage network consists of combined sewers that carry sewage and rainwater in the same pipe, as well as separate surface water and foul (sewage) only sewers. The system has developed over the past 40 years with the construction of large interceptor systems, underground storage tanks and full sewage treatment to bring about significant improvements in river and coastal bathing water quality.

We currently operate 1,567 SOs that are mainly on the sewerage network, but with more than 120 of them associated with discharges from storm tanks on sewage treatment works (STWs). The network SOs are designed to pass forward a certain flow and once capacity has been reached in the pipe, storm water is permitted by the EA to discharge into the environment, preventing assets from becoming overwhelmed and protecting properties from flooding. They have been assessed and improved over the past 25 years with the installation of screening controls to reduce the impact of sewage related debris, particularly at amenity sites (communal sites for recreation and enjoyment). Nearly 60% of these overflows have a physical screen or a screening equivalent.

Storm tanks on STWs are permitted to fill once the flow into the works has reached a maximum design flow for treatment. Unlike the discharges from network SOs (and some at our STWs too), where storm tanks exist, they provide some level of treatment that allows solids to be removed prior to stormwater being discharged to the environment or returned to the process.

Our 2021 published [Event Duration Monitoring \(EDM\)](#) for our SOs shows that of the 1,542 SOs with data, the average spills per year were 25.3 compared to the industry average of 29.4 with the average duration per spill event being 6 hours against the national average of 7.4 hours. There was a total of 36,483 spill events with an average percentage time operating of 1.7% compared to 2% for the industry.

PLANNING AND INVESTMENT

Our approach means that we focus our investment activities to provide the greatest possible environmental benefit through long-term planning and investment that includes commitments to projects, schemes and partnerships.

We recognise our role in helping meet water quality objectives for rivers and coastal waters, and we aim to ensure that our customers' money is spent on well justified investment that will deliver real improvements to water quality and ecology and represent good value.

In the period 2020-25, we will be directly investing over £400 million into activities that will enhance the quality of water in our rivers and coasts. Alongside this direct investment, through working in partnership and leveraging funding, this sum will exceed over £500 million. This investment is also designed to improve our processes, reduce carbon and create resilience in the system for future severe weather events.

As an example of leveraging value, our holistic, partnership-led approach to improving the water environment, is delivering hundreds of kilometres of improvements to our rivers and coasts. As a large and trusted company, we are able to use our convening power to rally the resources and efforts of organisations with similar aims, leveraging in millions of pounds of additional funding for environmental benefit.

This approach also means we are investing where it is most effective; learning from others about where the need is greatest and seeking nature-based solutions to address problems at source, before they enter our networks or watercourses, rather than working on 'end of pipe' solutions that fix a problem that has already occurred.

Working in genuine partnership leads to a joined up and holistic approach to problem-solving avoiding a silo mentality that can drive organisations to focus only on the bit of the issue that they can see often leading to more expensive and more environmentally damaging 'end of pipe' solutions in many cases involving the pouring of concrete and increased carbon emissions.

An example of this partnership approach is the innovative Northumbria Drainage Partnership (NIDP) which brings 13 Lead Local Flood Authorities across the North East together with the Environment Agency and Northumbrian Water to reduce flood risk and promote sustainable drainage. The NIDP partners work together to prioritise and jointly fund integrated flood risk studies and jointly deliver schemes to tackle flooding from sewers, rivers and surface water affecting communities across the North East.

Our Drainage and Wastewater Management Plan (DWMP) provides a basis for long-term planning of drainage and wastewater services, demonstrating how we will protect public health, support economic growth, support resilient communities, and protect and enhance the environment. It includes planning objectives, such as those associated with SOs, growth and coastal/river water quality. We will analyse wastewater performance across our region and highlight where future work will be needed.

We use computer models of the drainage network across our region to understand how the network behaves now, and then introduce proposed developments (as well as climate change data) into the model, to see what the impact on our drainage network operations would be, before putting plans in place to invest in changes and upgrades to our assets so that we are well prepared for the future.

RESPONDING TO THIS CONSULTATION

PERSONAL DETAILS:

1) Are you responding as: [individual/water company/charity/consumer organisation/other]

Water Company – Northumbrian Water

2) Do you know who provides your water and sewerage service? [Yes/No/Not applicable]

Not Applicable

3) If yes, please select from list [Anglian/Northumbrian/Severn Trent/Southern/South West/Thames/United Utilities/Wessex/Yorkshire]

Not Applicable

4) Confidentiality question: Would you like your response to be confidential? [Yes/No]

No

5) [If yes] Please give your reason.

Not Applicable

STORM OVERFLOW REDUCTION TARGETS: WATER COMPANY ACTIONS

1. Protecting the environment

Headline target: Water companies shall only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact. This must be achieved for all storm overflow sites by 2050.

Sub-targets:

- The headline target must be achieved for most (75%+) storm overflows discharging in or close to high priority sites by 2035.
- It must be achieved for all (100%) overflows discharging in or close to high priority sites by 2045.
- Water companies must plan to achieve this target for all remaining storm overflow sites by 2050.

2. Protecting public health in designated bathing water

Headline Target: For storm overflows discharging into and near designated bathing waters, water companies must significantly reduce harmful pathogens by either applying disinfection, such as with ultraviolet radiation, or reduce the frequency of discharges to meet Environment Agency spill standards by 2035.

3. Ensuring storm overflows operate only in unusually heavy rainfall events

Headline Target: Storm overflows must not discharge above an average of 10 rainfall events per year by 2050.

Sub-target:

- Water companies must also ensure all storm overflows, regardless of where they discharge to, have screening controls to limit discharge of persistent inorganic material (as well as faecal and organic solids), and they must be well maintained. This means the screen must be designed and maintained so that it always effectively achieves the solid separation and flow rates that it was designed for. This target must also be met by 2050.

QUESTIONS AND RESPONSE:

6) Do you agree or disagree with the level of ambition of the ecology target? [strongly agree, agree, neutral, disagree, strongly disagree, don't know/no answer]

NEUTRAL

We support the level of ambition in protecting the environment from any local adverse ecological impact resulting from our storm overflow discharges. However, it is important that other factors that lead to rivers not achieving good ecological status are considered too, with the largest contributor being agriculture (36%), then water companies (24%), followed by the urban environment such as highways and drains (11%)³. This shows that we are not the only or even the most significant contributor to rivers not achieving good ecological status, and that actions on water company causes (including misconnected drainage to surface water systems) will therefore not solve the issue alone. Others will also need to take firm action to make our rivers as good as they can be.

A key reason that we have only rated our support as 'neutral' is that we would like to see further guidance on the definition of harm, particularly in connection with providing evidence that 100% of SOs will not have any local adverse ecological impact by 2050. Such absolute standards could lead to best value solutions being excluded in favour of solutions that deliver a higher standard at an excessive cost – and other harm to the environment, such as through increased greenhouse gas emissions. All potential improvements should be considered with reference to avoiding a cost to our customers that they would deem as excessive or inappropriate. This can be complex where SOs discharge into a culverted watercourse or surface water sewer along with other SOs and other inputs, such as misconnections and highway drainage (e.g. car washing, incorrect disposal of chemicals).

To meet this target, we would need to carry out extensive monitoring upstream and downstream of SOs under the Urban Pollution Management (UPM) standards. This work would be required to determine the performance of the overflow against the Fundamental Intermittent Standards (FIS) for both Ammonia and Dissolved Oxygen directly downstream of the overflow point.

We expect that the UPM investigations will form part of our Water Industry National Environment Programme (WINEP) under the awaited SO PR24 guidance from the Environment Agency (EA).

We welcome clarity from Defra on provision 83 of the Environment Act 2021 for water companies to progressively reduce the adverse impacts on the environment associated with ecological harm. This also links to the provision in the Act for water companies to continuously monitor water quality upstream and downstream of SOs and wastewater treatment works. We are keen to support the SO Task Force (SOTF) in the development of the guidance and secondary legislation associated with this duty, particularly in how it relates to the UPM FIS standards under this target.

Given the timeline, monitoring and analysis would need to start as soon as possible if we are to deliver the necessary ecological improvements. We'd welcome Defra and Ofwat's support for early start work ahead of AMP8 and an adaptive or agile approach to PR24 to allow for planning, investigations and improvements without the constraints of lumpy investments through AMP cycles.

³ Source: 5. Source: The Environment Agency Catchment Data Explorer, September 2021

The earlier timescales may make collaborative or green solutions (i.e. nature based solutions) more difficult to deliver as they typically take significantly more time to develop and implement. This is due to a number of reasons including delays and uncertainties in attaining collaborative funding and certainty of delivery.

Our Priority Sites

Our topography in the North East of England consists of steeply sloped and fast running watercourses that offer greater dilution and mixing of SO discharges compared to other parts of the country, such as the Midlands, with flat slow running rivers.

There are many different environmental designations in our operating region, some of which are in our ownership as part of our landholdings and operational sites. Much of our coastline is designated as a Special Protection Area (SPA) for the conservation of wild birds with some areas also protected as Marine Conservation Zones (MCZs). Several of our more rural rivers are designated as Sites of Special Scientific Interest (SSSI).

We work in partnership with many organisations that have duties and responsibilities to maintain and improve the condition of these designated sites, such as Natural England (NE), Nature Partnerships and AONBs. For example, many of the designated SSSI sites in our region are either in favourable condition (23%) or are in recovery to favourable (63%).

In our assessment of designated sites, we have found that around 265 SOs are within the proximity of designated sites (within 500m) and to reduce spills to below 10 per year would require an estimated £200 million (storage costs only).

For waterbodies that are currently failing ecological standards we have made an assessment using the EA's updated Reasons for Not Achieving Good Status or RNAGs information. A RNAG records the source, activity and sector involved in causing an element to be less than good status. Each RNAG has an associated level of confidence, these being confirmed, probable and suspected. Only those RNAGs with a confirmed or probable status will have an improvement measure assigned. RNAGs alone do not represent the scale of impact from each sector and arise from multiple sources.

We work closely with the EA and NE in developing our WINEP investment plan towards proportionately addressing our share of RNAGs. Much of this improvement is led through continuous wastewater treatment discharge schemes, such as those to reduce levels of phosphorus in the receiving watercourses.

In AMP6, we delivered several Water Framework Directive investigations that included confirmed or probable RNAGs against intermittent discharges (SOs) for levels of phosphorus and/or ammonia. The monitoring and analysis phase identified that the main water quality impact was not in fact from SOs but from polluted surface water outfalls (PSWOs) linked with misconnected drainage. Therefore, we weren't required to carry out detailed UPM modelling to assess overflows against the FIS standards. This highlights that even if the RNAG is confirmed, further investigations can reveal more compelling evidence for the RNAG or a reason for deterioration. Hence, even when an RNAG is either at confirmed or probable status it cannot be relied upon wholly until detailed investigations, monitoring and data collection has been carried out. Also, water company measures alone that address a proven RNAG will not necessarily move a waterbody to good status. It is important therefore to carry out quality monitoring post any improvements to confirm changes in expected quality.

We continue to work closely with the EA in developing our PR24 Business Plan. We are looking to include investment to address misconnected drainage from private properties that accounts for around a third of all our RNAGs.

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We have assessed the RNAGs associated with our SOs in the development of our Drainage and Wastewater Management Plans (DWMPs). Initial results show that of the 65 SOs identified, 54 are shown as spilling in the model with the remaining 11 effectively being non-spillers. Estimates to eliminate the spills from the 54 SOs are between £105 million for conventional network storage and up to £1.1 billion for surface water separation. This highlights indicatively the potentially significant difference in scale of costs between grey and blue/green solutions with a 10-fold increase.

**7) Do you agree or disagree with the level of ambition of the public health in designated bathing waters target?
[strongly agree, agree, neutral, disagree, strongly disagree, don't know/no answer]**

NEUTRAL

We support the level of ambition in protecting public health in designated bathing waters by significantly reducing the levels of potentially harmful bacteria associated with SO discharges into or near to designated bathing waters. However, we are neutral in our support as it is important to consider the costs, value and outcome of any improvements. It is the overall outcome which matters in that public health should be the focus. If we focus on the highest level of ambition at SOs and do not tackle other sources, then the outcome may not be that desired. There are many other forms of bacteria affecting bathing water quality at designated sites, such as from agriculture, highways, housing (through misconnections), and private treatment works. Although we fully support the ambition, it is important to note that reducing SOs discharges will not resolve all contaminating sources. Again the cost and value of the interventions should be proportionate with the desired outcome and it is important to calculate the cost to water company customers' bills and whether they support a proportionate bill increase.

We will work closely with the EA over the requirement to either apply disinfection (e.g. seasonal ultraviolet treatment), or reduce the frequency of discharges, in accordance with their spill standards. This will include agreeing the SOs that have a tangible and evidenced impact on bathing water quality so that we can deliver on the need for a significant reduction in harmful pathogens by 2035.

We welcome the forthcoming publication by the EA of the new standards for rivers and will continue to support the development of guidance and regulation for bathing water quality; both locally and nationally.

Bathing Water Quality

We have invested more than £350 million over the past 25 years in bathing water quality improvement which has consisted of intercepting SOs, construction of storm tunnels and moving SOs away from beaches. This is backed up with the 'belt and braces' provision of full secondary sewage treatment, long sea outfalls into high natural dispersion areas, and ultraviolet disinfection.

We are currently investing around £7.5million into investigations at 11 bathing waters and several schemes that add extra screening, reduce flows and improving bathing water performance.

This investment has resulted in a strong record of improvement in bathing water quality with 32 out of 34 beaches being classified as either Excellent (25) or Good (7). We introduced a stretching bespoke Performance Commitment and Outcome Delivery Incentive for 2020-25 that is to contribute to all the region's bathing waters being 'Good or Excellent'. This sits alongside our industry leading record on preventing pollution incidents.

We have historically designed and implemented bathing water quality improvement schemes using industry standard Marine Impact Modelling (MIM) techniques. Our Northumbria Coastal Modelling System (NCMS), which has been upgraded to the latest specification, has been used to determine all sources of bacteria impacting a bathing water and their relative contribution. Our approach identifies the wastewater assets that have the most significant impact so that beneficial schemes can be implemented to bring about a step change in bathing water quality.

It's important to note that the MIM approach has been used successfully by the water industry in the UK as well as world-wide for designated waters to protect public health. Our improvement programmes have been carried out in agreement

with the EA in delivering our environmental obligations in meeting the Bathing Water Regulations. The EA's standards have been a choice between the three discharges per season for 'Good' or two for 'Excellent' default, or through demonstrating compliance from water quality modelling (i.e. MIM). The majority of water companies have used the latter MIM approach with only one company preferring to predominantly use the default discharge standards.

Working in partnership is also a crucial aspect of maintaining, investigating and improving bathing water quality for our communities, tourism and public health. An example of this is at [Tynemouth Cullercoats](#) where we have been working since 2017 with the EA and Local Authority to determine the main cause for the deterioration in quality to Poor. Through our extensive programme of work, that has included a recently completed WINEP investigation, we have jointly determined that the main cause is contaminated groundwater. There aren't any SOs discharging at or near to the bathing water and our assets haven't been found to be contributing to the deterioration. Other examples have seen quality improve - from Poor ten years ago to Excellent now with Blue Flag status – as a result of carrying out collaborative works including investment in our assets to reduce discharges, alongside priority catchment investigations (by EA or SEPA) to prevent agricultural sources of bacteria.

The target to move to the EA's default spill standards (or disinfection) for all SOs discharging into or near to designated bathing waters will in most cases have little or no impact on bathing water quality classifications. We would therefore propose to determine with the EA the SOs that have a measurable impact on quality from our MIM/NCMS so that the investment can be targeted appropriately in reducing harmful bacteria. This would initially exclude the SOs that have no or negligible impact, such as those high up in the catchment, or those that discharge through long sea outfalls into high natural dispersion areas, until they are improved under the rainfall spill limit target by 2050.

The timescale for improvements at bathing waters also makes collaborative or green solutions more difficult to achieve as they can take significantly longer to develop and implement. There can also be barriers in taking these types of jointly funded solutions forward. An example is our pioneering work through the Northumbria Integrated Drainage Partnership (NIDP) to tackle flood risk with the EA and local authorities and implement sustainable drainage. Although the investment can include other benefits, such as wider catchment improvements (e.g. amenity value and biodiversity), the main aim is to protect properties from flood risk. Improvements to bathing water quality are therefore difficult to promote as they don't meet the criteria under Flood Defence Grant-in-Aid (FDGiA) funding.

For further information on our commitments for coastal waters, please see [Vision for our Coast and Rivers](#) and our [Bathing Water website](#) that includes our Beach Aware spill notifications.

8) Do you agree or disagree with the level of ambition of the rainfall target? [strongly agree, agree, neutral, disagree, strongly disagree, don’t know/no answer]

NEUTRAL

We support the level of ambition for all SOs to only operate in unusually heavy rainfall events and to have screening controls installed to limit the discharge of persistent organic material. However, we consider that this target is too narrowly focused on one industry sector in delivering the best value for customers against the overall outcome of reducing ecological harm and protecting public health.

We assume that 10 rainfall events per year is a surrogate for what is in effect 10 spill events in a year using the EA’s 12/24hr spill count method. We also assume that this target applies to all SOs whether they discharge into estuaries, freshwater rivers, or non-designated coastal waters.

It may also be the case that monitoring and analysis under the no local adverse ecological impact target might require that certain discharges should discharge below 10 times a year.

We believe that the delivery timescale is the biggest risk in meeting this challenging target and may possibly lead to regret investment. We must be careful in working at a pace that is affordable to our customers and fair to our communities while seeking the highest environmental performance. Our preference is to develop and implement sustainable long-term integrated strategic solutions based on surface water separation, sustainable drainage systems (SuDS) and nature-based solutions (NBS). We believe laying down plans now for how things should be done over the long-term will get the best outcomes for our environment in an affordable way.

There is a requirement for a compliance methodology to be developed for this target by the EA in conjunction with the industry. This should consider how it will be regulated, such as in the application of a long-term averages to account for annual changes in rainfall, and a review of the screening control guidance that is currently based on amenity value.

We are unclear on how the installation of screening controls will limit the discharge of persistent organic material and require further guidance as to how this is defined, evaluated and measured.

Storm Overflows

We have considered the overall delivery timescales for our SOs. For illustration purposes, based on our current 1,567 overflows, this would be equivalent to improving almost one overflow per week to 2035, and then 1.5 SO improvements per week up to 2050. This will include a sub-set that already meet the rainfall target but may still require improvements, such as for ecological impact, bathing water target or screening controls.

Year	2025 - 2030	2030 - 2035	2035 - 2040	2040 - 2045	2045 - 2050
% of <u>total</u> overflows improved	14%	28%	52%	76%	100%
Total number of SOs per 5 year period (AMP) (NWL)	219	219	376	376	376

It is important to acknowledge that the frequency and duration of SO spills is principally governed by the amount of rainfall that each part of the country experiences. Historic trends have clearly identified those areas that receive the most rainfall

annually, such as the North West and South West of England. This is opposed to drier parts of the country like the South East and London which receive substantially less annual precipitation.

There are also significant differences in the number of SOs that each company operates. This is largely dependent upon a wide range of factors, such as population served, historical investment in the sewerage network and the built environment. In comparing the normalised number of SOs for each company against their total length of sewers served, we can see that we have the second highest number of SOs in the industry (behind South West Water), with Thames Water having the fewest.

Company	Total length of sewers (km)*	Number of SOs	SOs per km served
South West	17,440	1,209	0.069
Northumbrian	30,026	1,567	0.052
Yorkshire	52,292	2,246	0.043
Wessex	34,944	1,289	0.037
Severn Trent	93,525	2,954	0.032
United Utilities	77,339	2,273	0.029
Southern	39,729	986	0.025
Anglian	76,437	1,646	0.022
Thames	108,980	472	0.004

The differences in annual rainfall together with differences in number of SOs across water companies will mean significant differences in the scale of investment and bill increases required to meet the targets. This impacts directly on the affordability of these changes with customers facing rising water bills particularly in light of the current cost of living crisis.

We support the use of long-term averages to account for annual fluctuations in annual rainfall. In our DWMP modelling we have predicted spill performance using a ten-year time series rainfall using actual rainfall for our region. This has been adjusted to account for climate change and growth. We propose using a ten-year rolling average horizon rather than five-year average in demonstrating long-term performance of SOs against the targets. We will support the development of the compliance methodology in collaboration with the EA and appropriate industry group that will be important in how we design and implement discharge reduction solutions.

We consider that long-term targets must allow for more collaborative and integrated solutions that supports the wholesale removal of surface water from the combined sewerage network. The overall delivery profile is problematic and challenging that may also lead to regret investment. Surface water separation and sustainable drainage are regarded as the right things to prioritise while working alongside our partners to maximise and enhance benefits across catchments.

It is vital that surface water is returned to the water environment safely with consideration of any potential impact, such as from misconnected plumbing, and incorrect disposal of substances like engine oil, paint and detergents. It is estimated that between 0.6% and 2% of all properties have some kind of misconnection at any one time leading to polluted waterways

and potential impacts on public health⁴. We have examples of polluted watercourses in our region that have no discharges from SOs and are severely impacted by misconnected properties through surface water discharges.

The targeting of surface water removal and the increase in available capacity could also positively impact the use of storm tanks on our STWs by reducing storm flows. However, given the timescales that prohibits long-term development and implementation of collaborative sustainable or green solutions, this will result in additional storage capacity to be constructed and the knock on effect of more storm flows in the system going for treatment and discharges from storm tanks. This will necessitate the construction of additional network pumping and treatment capacity at our existing works to deal with the increase in flows that are retained in the system and also the transfer of flows to completely new treatment facility.

Screening Controls

We have carried out significant investment programmes over the past 25 years to resolve unsatisfactory intermittent discharges (UIDs). The work consisted of detailed surveys of SOs to understand their performance and determine any amenity impacts, such as sewage fungus and litter. Where necessary, this was followed by the installation of screening controls to reduce amenity impacts, such as static 6mm 2D screens or mechanically operated raked screens. This represented the upgrade of some 700 sites accounting for 58% of our network SOs. Overflows without a physical screen may also meet what is known as a 'screening equivalent', be designed to spill one in five years without a screen requirement, or spill into a low amenity site with no confirmed impacts. Overall, this investment improved SO performance and has also been reflected in our historical industry leading pollution incident performance.

The sub-target to make sure all SOs, regardless of where they discharge to or their performance, will have screening controls to limit persistent organic material (as well as faecal and organic solids), will require considerable investment. Our initial estimate based on our previous UID programmes, will mean an expenditure of between £175 million and £245 million. The capital works required will not only include the installation of screening controls but will include other costs, such as the re-sizing of existing chambers, land purchase and access for construction activities.

Some of our SOs already meet the spill target but do not currently have any requirement for screening controls under the previous UID programme. Through our monitoring over the last ten-years we have around 55 SOs that haven't recorded a spill. The current EA guidance for screening controls requires reviewing in light of this new requirement that is based on amenity value and impact. The revised guidance should differentiate between the screening requirement for SOs dependent upon historic spill performance and design. For example, a bar screen will be adequate for those SOs that are proven to be spilling infrequently or not at all.

Through our planning and investment in meeting the targets, we may decide to abandon some SOs such as those that currently have no physical screening control installed. We will develop our investment plans to consider all aspects of the targets in collaboration with our partners to determine the most efficient investment whilst importantly also protecting properties from flooding.

⁴ <https://utilityweek.co.uk/the-rights-and-wrongs-of-misconnections/>

9) Do you agree that this package of targets as a whole addresses the key issues associated with Storm Overflows? [strongly agree, agree, neutral, disagree, strongly disagree, don't know/no answer]**NEUTRAL**

We are supportive of the overall direction of travel and level of ambition set out in the consultation document consisting of the overall package of targets and actions for water companies and the Government to take in minimising any environmental harm and protect public health from SOs. This builds on the environmental ambition contained in our 2020-25 Business Plan, and more recently in the pledges set out in our vision for rivers and coasts. However, the scale of investment required to address not just the harm caused by SOs but also reduce the number of spills that potentially do not cause harm presents a serious challenge not just to companies to deliver, but also to affordability and disruption for our customers.

Our customers do consider environmental improvements to be a high priority, but in the current context of inflationary pressures and squeezed household budgets it is not yet clear whether that will carry through to support for higher bills. In recent research by Ipsos MORI inflation was identified as the most or an important issue for adults in Great Britain today by 32% of interviewees, while pollution, the environment and climate change was fifth, being mentioned by 13%⁵.

As we prepare for our next price review and build our Business Plan for 2025-30, we are acutely aware that our customers are facing unprecedented affordability pressures. There is the potential for £4 billion to £24 billion of investment to be needed by 2050 from Northumbrian Water to address SOs. This could add £174 to £1,042 per year, per household to average bills by 2050. This would result in real term bills rising from their current level of £365 to as much as £1,407 – an increase of 285%⁶.

And SOs are not the only thing that will put pressure on water bills. Water companies will be trying to deliver progress on Net Zero, improving service performance such as leakage, restoring sustainable abstraction, and meeting the industry's asset maintenance challenge to improve resilience in the context of climate change.

In this context, balancing investment needs with affordability will be more important than ever, and hence vital that we aim for an investment profile that customers can afford as well as delivering maximum benefit and value from all customer-funded investment.

At the time of responding to this consultation we are conscious that there is significantly more work to do to fully ascertain the costs and potential benefit of SO related investment. Upstream and downstream monitoring is required to firstly understand environmental impact and hence the potential benefit that can be derived from any interventions, and significant further investigation is needed to fully understand best value interventions, feasibility, and associated costs. This investigation activity would also focus on maximising the opportunity to use surface water separation, sustainable drainage, and nature-based solutions through collaborative integrated solutions with our partners. It is also important that we develop accurate costs and benefits information such as for retro-fitting SuDS which is currently an area of significant uncertainty with few examples to reference in making firm planning and investment decisions.

⁵ ['Issues Index'](#), Ipsos MORI, April 2022.

⁶ Based on our analysis of the impact on Northumbrian Water's average bill of an additional £4 billion to £24 billion of investment. Our analysis shows this impact is the same order of magnitude as our share, by number of SOs, of the full range of capex costs of £1.9 billion to £23.2 billion, from ['STORM OVERFLOWS EVIDENCE PROJECT – 2022 ADDENDUM'](#), Stantec, March 2022, which would increase average bills by £82 to £1,007 per year, per household.

Given the above, we consider that a delivery profile that focuses on extensive monitoring and investigation activity to 2030, with substantive investment ramping up from 2030-2035 onwards once costs and benefits have been more fully assessed, would be the most appropriate with the least potential for regret investment. This would also allow for upfront activities to take place with respect to planning, such an integration of plans with stakeholders and facilitation of land acquisition for sustainable solutions, such as nature-based solutions.

Challenges and Opportunities

We have considered the following overall challenges in delivering the targets and actions set out in the consultation document.

- **Affordability** – the potential scale of investment required will have a significant pressure on bills, with average bills rising by as much as £1,042 per year by 2050⁷. With customers facing a cost-of-living crisis this will add to their financial pressures. It is also important to recognise that other factors for water companies may result in upward pressures on bills to 2050, such as continued reduction in leakage and improvements in resilience.
- **Customer support** – we are committed to delivering the best value for our customers in the provision of sustainable water and wastewater services. In our planning this means making the right long-term decisions that meets the expectations of current and future generations. It is vitally important therefore that we understand customer support and their willingness to pay (WTP) in making a step change in SO performance and revolutionising the sewerage system. We must balance decisions against our customers' willingness and ability to pay – we want water to be affordable for all and good value. Our DWMP customer research in 2020 highlighted they largely prefer sustainable approaches, particularly among those who use rivers recreationally. High priorities were found to be pollution from SOs, sewer misuse, misconnections, and urban creep. And in research carried out by Explain for Northumbrian Water in 2021, we found similar levels of support from household customers for our ambitions to 'deliver world class customer service' (81% in the North East, 88% in Essex and Suffolk) and for us to 'have zero pollutions as a result of our assets and operations' (87% in both areas). But there were higher levels of support for us to 'be leading in the sustainable use of natural resources, through achieving zero avoidable waste by 2025 and being carbon neutral by 2027' (94% and 87% respectively). We are committed to testing the Government's Discharge Reduction Plan targets with our customers.
- **Deliverability** – we have estimated that to meet the targets we will need to improve almost one SO per week to 2035 and then at least 1.5 SOs per week to 2050. This will be extremely challenging both in terms of feasibility and programming but also in the potential for significant disruption for our customers and businesses. This is compounded by the significant other pressures on the sector's ability to scale up investment to this degree:
 - o **Supply chain capacity (e.g. contractors, manufacturers)** – It is widely recognised that there is currently a [skills shortage in the construction industry](#) and given the scale of investment for SOs there will be a requirement to resolve this through targeted education, training and recruitment. This will undoubtedly impact on achievement of the earlier targets to 2030 and 2035 where having sufficient resources will be an issue. There is a need for government and sector-wide action in support for training and education to meet this skills gap.

⁷ Based on our analysis of the impact on Northumbrian Water's average bill of an additional £24 billion of investment.

- **Demands on resources** – There are competing demands for supply chain resources across the country that are needed for other key areas of national infrastructure investment. For example, the [Government's Energy Security Strategy](#) is outlining the need for eight new nuclear power stations by 2050 alongside demands to accelerate renewables, such as wind, solar and hydrogen-based technologies. There also demands on our regulators to have sufficient resources in place to support water companies in delivery this scale of investment, such as in developing plans, approval of schemes and in permitting.
- **Materials** – we are currently experiencing significant price increases for construction materials with rising inflationary pressures. Demand for the same raw materials is set to continue with requirements towards meeting national infrastructure projects including those for HS2, Net Zero and energy policy.
- **Net environmental impact** – the speed, scale and scope of the investment required to meet the proposed targets are likely to preclude the use of nature-based solutions even where they are feasible. Instead, the sector is likely to need to invest significantly in the construction of concrete tanks. Unlike nature-based solutions, concrete tanks do not create habitat to support biodiversity and their construction also results in greenhouse gas emissions, creating further challenges to meeting the UK government's target to reach Net Zero emissions by 2050. This, combined with the emphasis on reducing spills instead of reducing harm may result in the proposals have a net negative impact on the environment. We need to ensure that we get the right environmental answer in the round. Protecting rivers by providing treatment to rainwater using concrete, chemicals and power may not be the best answer. Solutions should have proper environmental assessment to avoid unintended consequence for the environment.

The scale of investment presents a real opportunity to develop and implement holistic integrated interventions in collaboration with partners based on least regret investment through surface water separation, sustainable drainage, and nature-based solutions. There will always be a role to play for conventional solutions, such as in the construction of addition storage and treatment capacity, in meeting the SO targets. However, evidenced based integrated planning across drainage catchments will realise longer-term benefits for customers and the environment, such as in biodiversity, amenity value and flood risk reduction.

Working in partnership is essential in meeting the ambition for our rivers and coast. By working in partnership we can effectively engage communities and enlist the support of customer volunteers in protecting our environment. As an example, we are leading the sector with the innovative North East Catchments Hub. We have teamed up with The Rivers Trust in a new approach to drive work that will inform investment to benefit water and the environment in the region. This exciting new partnership brings together local, regional and national expertise in a regional hub to develop improvements for water quality and the wider environment around the North East. It will form a focal point for our planning and partnership working to improve the environment through catchment and nature- based solutions. Another example is our plans to double the number of our Water Rangers – our citizen scientist volunteers who are trained to help us monitor environmental conditions around rivers and take action to address wider river issues such as littering, fly tipping or signs of pollution.

We also work in partnership to tackle flooding through the Northumbria Integrated Drainage Partnership (NIDP). This is an innovative approach developed from the Tyneside Sustainable Sewerage Study. It brings 13 Lead Local Flood Authorities across the North East together (with the EA and ourselves) to reduce flood risk and promote sustainable drainage. NIDP partners work together to prioritise and jointly fund integrated flood risk studies and joint delivery schemes to tackle flooding from sewers, rivers and surface water affecting communities across the North East. Partners have already jointly invested more than £9 million to reduce flood risk to around 1,000 homes, with more projects currently in construction or in the planning and design stages.

There is also an opportunity for early start work ahead of AMP8 and an adaptive or agile approach to PR24 to allow for planning, investigations, and improvements without the constraints of lumpy investments through AMP cycles. We would welcome Defra, Ofwat and EA support in carrying out upstream and downstream monitoring in advance of AMP8 to determine local adverse ecological impact at priority sites. A proportion of this could be accommodated in our current WINEP programme by re-purposing investment.

We would also like to see a different approach to PR24 WINEP planning for SOs especially given the timescales with EA guidance expected to be published in June 2022. The opportunity here is to allow for investigations and improvements in the same five-year investment period through adaptive planning and we welcome the Government's support in streamlining the planning process.

Achieving the Targets

The Victorian design of sewers and the combined legacy they have left would be incredibly expensive to separate or re-engineer – at a cost of up to £24 billion for Northumbrian Water customers alone – the equivalent of an additional £1,042 per year, per household, which would increase average bills by 285% to £1,407⁸.

Throughout the historic development of our major towns and cities, watercourses were once open sewers devolved of life that were then culverted and built over. They then became part of the Victorian sewerage system discharging raw sewage into main rivers and the sea. These flows have been intercepted to clean-up and bring back life to our rivers, such as the River Tyne with the return of migratory salmon, through the significant investment over the past 50 years in large interceptor systems followed by full sewage treatment.

Unpicking this legacy is a hugely complex task and requires long-term strategic investment that is evidence based, affordable and best value for our customers in protecting the environment. It also presents uncertainty in the scale of costs involved and therefore impacts on customer bills. We therefore consider a delivery profile that initially focuses on monitoring and investigation activities through to 2030 to allow for costs and benefits to be more fully assessed before ramping up construction activities to provide cost effective integrated catchment solutions in meeting the targets to 2050.

Through our DWMP planning, we have demonstrated clearly that it is not feasible to meet the governments targets using green infrastructure alone. The significant proportion of investment will be in network storage and will require the upgrade of existing treatment works or construction of new treatment facilities. We are assessing the quantity of surface water to be dealt with at each SO using our DWMP ten-year time series rainfall that is based on actual rainfall data and the 11th worst spill as a design criterion.

With the first and subsequent cycles of the DWMPs being produced the industry needs a standard approach to assessing and planning for the impacts of climate change, especially with the recently published UKCP18 climate change projections. The industry also needs tools and specific guidance on how to apply this information, especially as they are likely to become regulatory requirements in AMP8.

Relating to SOs there is particularly an issue for time series rainfall assessments used in the design and analysis of SO performance. A UKWIR project is being carried out to revise and update the RedUP tool (the industry tool used to uplift time series rainfall) to reflect the changes in UKCP18. The project is anticipated to be completed summer 2022. This work

⁸ Based on our analysis of the impact on Northumbrian Water's average bill of an additional £24 billion of investment.

and any future iterations can only be completed with the help of academic research and climate models which are run and supported externally to the water industry.

Government Actions

We welcome and support the government's actions in streamlining the planning process and for better rainwater management. We have actively supported the SO Task Force in developing the recommendations for legislative change that are important for controlling surface water. We urge the government to make these necessary legislative changes including enactment of Schedule 3 of the Flood and Water Management Act 2010.

The removal of the right to connect surface water from new developments is paramount to reducing future inputs of rainwater into our systems and provides opportunities to enhance biodiversity and improve water quality.

We would support current planning policy being reviewed and followed rigorously. For example, property owners need to apply for planning permission to pave over their front gardens (see [here](#)) but this rule isn't currently being enacted to make sure permeable or porous surfaces are installed and rainwater is allowed to drain naturally into gardens or borders.

We also welcome other policy opportunities for the Government to play a positive role in reducing the flow of surface water and wastewater into the system.

We encourage government support to changes to building standards so that new build properties are designed to be highly water efficient – at around a level of 100 litres per person per day – as this could reduce flows from these households by almost a third of current levels. If retrofitting was also encouraged to this level, then that impact would be hugely significant. Another way Government could help is by introducing a water efficiency label that indicates how much water products use and lets consumers make better informed choices. Put together with the regulations above, this could provide capacity and space in the network.

In addition, we support the Government's commitment in tackling the misuse of drains and sewers, such as disposal of fats, oils, greases, wet wipes, and nappies. We welcome the actions towards eliminating the use of wet wipes and for customers to dispose of them appropriately rather than down the toilet. Under the Water Industry Act 1991, it is illegal to put anything into the sewer network that can impede the flow of the waste it was designed to carry – toilet paper, pee, and poo.

Our research shows more than 60% of the blockages found in our sewerage networks contain wet wipes. As a result, our successful Bin the Wipe campaign aims to protect homes and the environment from the issues caused by these blockages.

We urge the Government to adopt the measures outlined in the Plastics (Wet Wipes) Bill to prohibit the manufacture and sale of single use cleaning and hygiene products containing plastic. The water and grease management industry must develop standards for the sectors which use fats, oils, greases, routinely to collect and dispose of such responsibly without it entering the drainage network.

12 MAY 2022

10)[if not] Can you explain why you do not agree?

Not applicable.

11) Would you be willing to pay more in your monthly water bill in order for water companies to tackle sewage discharges as outlined in this consultation? [Yes/No/Don't know/ N/A]

Not applicable.