NORTHUMBRIAN WATER living water

ESSEX&SUFFOLK WATER living water

NATURE OF ADJUSTMENT FORMS

March 2019

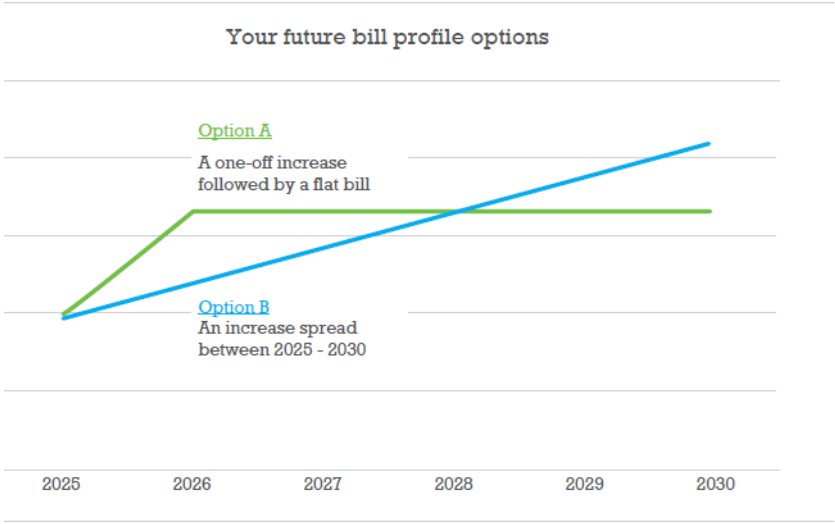
CONTENTS

NES.AV.A1

A 3% increase in bill profiles beyond 2025, and in particular for the 2025-30 period, was tested with customers at deliberative workshops in March 2019. The six workshops were chaired by an independent market research partner, Explain Market Research, and were conducted in line with the Market Research Society Code of Conduct, which follows social research best practice.

The workshops were designed with our Water Forums, and the findings were assured by them.

The bill increase was presented as either a one off increase and then a flat bill or an annual increase every year for five years, as shown in the graph below.



The majority of customers (69%) prefer Option B.

The results of the engagement can be found in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 2 – IABP Additional Customer Research.

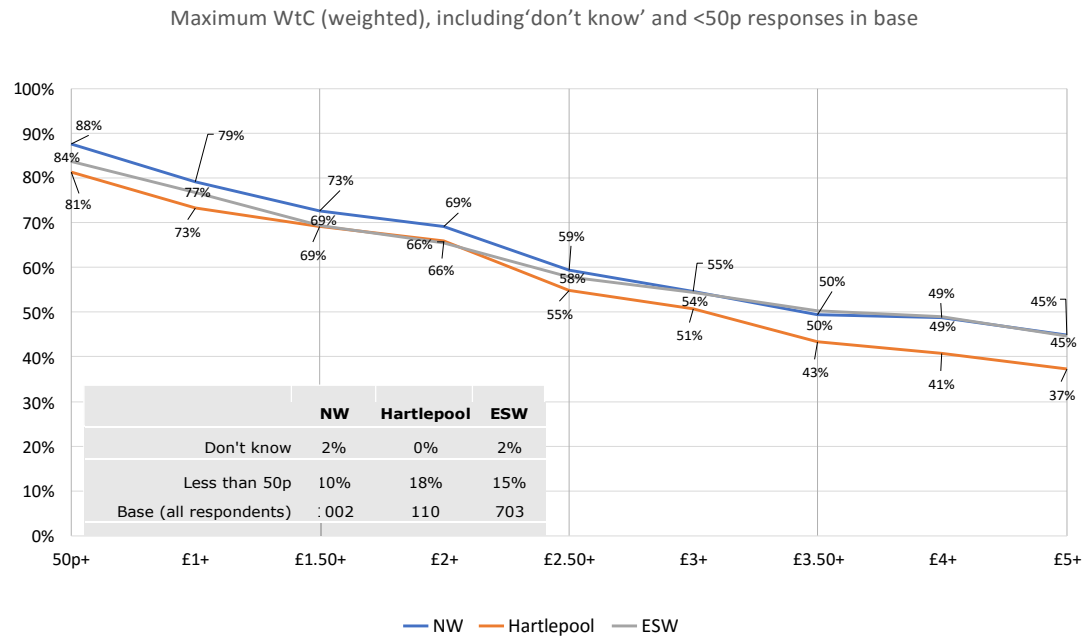
NES.AV.A2

Background
Prior to 2016, Northumbrian Water Limited was in a challenging position compared to most other companies in the industry, having been unable to secure customer support for a cross-subsidised social tariff. In 2016, we carried out further research, this time securing support for a cross-subsidy of £0.75 in the Northumbrian Water (NW) region and £1 in the Essex and Suffolk Water (ESW) regions. This allowed us to introduce our first customer cross-subsidised social tariff from 1 April 2018.

Our PR19 business plan addresses affordability and vulnerability, as part of this we carried out a customer research looking at different tariffs and the way water and wastewater services charges were constructed, as well as understanding which water affordability problems and circumstances customers were interested in supporting. We found customers had a strong preference to help low income pensioners, and so we committed in our PR19 business plan to look at exploring a cross-subsidised social tariff for this group.

2019 further social tariff research outcome
Further research was concluded in January 2019 which sought customers' views on increasing the existing cross-subsidy to specifically support low income pensioners. The research highlighted customer approval for an additional £2 cross-subsidy in both our NW and ESW regions. We have shared the research outcomes with the Consumer Council for Water, in line with Defra guidance on social tariffs, and they have confirmed their support for the increased cross-subsidy. The graph below shows that 66% of our customers in each area are willing to support an additional £2 cross subsidy for this tariff. We discussed the findings with CCWater, who gave us the following guidance:

- Higher cross subsidies require higher levels of acceptance from customers, and 65% acceptance would be sufficient for a £2 bill impact for customers in all our regions;
- The £2 level for this tariff (which amounts to a total social tariff cross subsidy of £2.75 in NW and £3 in ESW) is also lower than, or consistent with, other water companies' social tariffs.



	NW	Hartlepool	ESW
Don't know	2%	0%	2%
Less than 50p	10%	18%	15%
Base (all respondents)	002	110	703

The outcome of our latest research means that in total we have achieved customer support for a cross subsidy of £2.75 in the NW region and £3 in the ESW region. Using the latest billed household figures (December 2018) this works out at to be an average cross subsidy of £2.85.

December 18 figures

	Number	£/Household	Total Value £
Households Water ESW	736,365	£3.00	£2,206,095.00
Households Water North	1,090,406	£2.75/2*	£1,499,308.25
Households Sewerage	1,143,292	£2.75/2*	£1,572,026.50
Total			**£5,277,429.75**

Average cross-subsidy per household
£5,277,429.75/ (736,365+((1,090,406+1,143,292)/2)) = £2.85

*The NW cross-subsidy is shared equally between the water and wastewater service.

The average cross-subsidy of £2.85 is £0.07 short of the £2.92 we plan to achieve by 2025 and have set out in PR19 business plan as we move towards our zero water poverty goal. This £0.07 gap on December 2018 customer numbers equates to £131,035 or 655 customers short of our water poverty goal. This represents a very small number of customers compared to our overall ambition to eradicate water poverty from our regions by 2030, helping around 380,000 customers.

We are confident we can achieve the £2.92 target through a combination of additional support from customers - we will carry out further research to test this during the period to 2024 – and if our customers are not willing to support any increase to the cross-subsidy there are other elements of the plan that the company could flex to achieve our goal, such as increasing the numbers of customers supported by our cost neutral company funded scheme. It is also worth noting that the calculations above are based on our current occupied property numbers, so property growth and our planned void property reductions would increase the total number of billed properties between now and 2025.

NES.CA.A1-A2

We support the introduction of a common performance commitment (PC) in relation to the Priority Services Register (PSR). As always it is helpful to see a detailed definition as this will improve consistency of reporting across the industry. We are also in agreement that this should have a reputational incentive attached.

In line with the commitment made in our plan, we are proposing a PC level of customers registered for Priority Services to be 7.6% by 2020-21 rising to 10% by 2024-25, exceeding the minimum level indicated by Ofwat.

We also support the requirement for companies to make efforts in relation to PSR data checking. There is one specific aspect in relation to PSR data checking, however, which causes us concern. The aspect in question is for contacts to be defined as a proactive “interaction”.

This current suggestion is that companies should commit to an interaction with 90% customers who are on the PSR every two years. We are particularly concerned about the potential detrimental impact on customers in vulnerable circumstances.

Many customers who access PSR services will have enduring conditions such as sight impairments or dementia, which mean that they should not be removed from the register because they will always need extra support from us. We will be incentivised to interact with them unnecessarily. We doubt that our customers would support such actions.

In order to achieve interaction with 90% of customers on the PSR every two years, we are likely to need to make repeated attempts to generate an interaction to confirm the information we already know. To meet this PC, companies may need to write to a customer multiple times, phone, text, and knock on the door. These actions may result in actually making some customers’ circumstances worse, for example, by increasing anxiety or fatigue which exacerbates their symptoms.

We also support a requirement for companies to:

- Check data is correct at every interaction
- Demonstrate that they have proactively attempted to contact vulnerable customers to check whether their needs have changed regularly, using the channel that the customer wants us to contact them
- Make it easy for customers to tell them if circumstances have changed
- Inform customers when they have new or different services that could help them
- Commit as a minimum to writing to all customers every two years to ask them if their circumstances have changed.

In conclusion, we would like to request that Ofwat considers amending the PSR Data Checking PC to include attempts by companies to invite customer updates from customers about transient vulnerable circumstances (e.g. temporary illness, maternity, surgery) and offer additionally support through the customer’s chosen channel. If this was the case then we could offer 100% compliance.

Alternatively, given that this is a common PC, Ofwat could ask companies to collaborate on a consistent approach.

The Company has re-stated two forward looking Board assurance statements in relation to final methodology Board assurance requirements CA9.1m) and CA9.2. In relation to CA9.1m) Ofwat’s attention is drawn to section 10.5 of the Business Plan, which provides more detail on the

Company's enhancement optioneering methodology and the independent assurance provided by Mott MacDonald, Ernst & Young, Economic Insight and Frontier Economics.

In respect of CA9.2, whilst forward looking governance and assurance processes are robust, they will be enhanced through the appointment of a new Chief Resilience and Sustainability Officer (CRSO) to manage "resilience in the round" via the Company's Resilience Framework (as detailed in section 3.3 of the Business Plan). The CRSO will report to each meeting of the Board's Risk & Compliance Sub-committee (and annually to the Board) on operational, financial and corporate resilience and the appropriate management of risk associated with the Company's reliance on certain capital assets to provide its services. These "five capitals" (financial, manufactured, natural, social, and human and intellectual) are explained in more detail in Northumbrian Water Group's environment, social and economic impact report; "Our Contribution".

In addition, although not formally required by Ofwat, the Company has also clarified the comments in the Board Assurance Statement in respect of assurance requirements CA9.1d) and CA9.1g).

The sections of the Board Assurance Statement which have been updated in response to Ofwat's actions are attached (as per Ofwat's guidance), as is a further paragraph which has been added to describe the Board Assurance arrangements in respect of the re-submission of the Business Plan. This details the further meetings of the PR19 Board Sub-group and Board to discuss and agree how NWL would respond to Ofwat's Initial Assessment of Plans, and to formally approve the resubmission of NWL's Business Plan as well as all the responses to the actions raised by Ofwat.

NES.CE.A1.4

Opex Enhancements
In partnership with Anglian Water and Wessex Water, we have commissioned Reckon consultants to consider the approach Ofwat have taken in the cost assessment of opex enhancements. Reckon have met with Ofwat and we commend their report and the proposals they make.

We have supplied the Reckon report in our Initial Assessment of Business Plans (IAP) response.

We support the Reckon report, noting in particular:

- Ofwat's approach undermines the equivalent treatment of opex and capex enhancements that would be expected under a totex approach.

- Ofwat's approach treats companies that choose an opex solution less favourably in efficiency terms than those that choose a similar capex solution. It recreates the capex bias that Ofwat was aiming to eliminate through the use of totex.

Whilst we understand Ofwat's desire to take account of implicit allowances within base costs for opex, in our view, this should only apply for an area that has a clear base cost driver such as customer supply demand costs and not for areas such as investigations, Drainage and Wastewater Management Plans and Water Industry National Environment Programme (WINEP) related costs that relate to increased service quality.

We also note on pages 10 - 11 of the Reckon report the wide range of capitalisation policies across the industry. A company with a capex intensive approach will appear to be more efficient in the assessment of base totex, but less so for enhancement costs. This skews both models and makes them less reliable for cost assessment.

To match the approach taken by other companies and to allow for a level playing field in assessment, we have reviewed our capitalisation assumptions and adopted a less cautious approach which appears to be more in line with other companies resulting in a switch from opex to capex. The majority of the expenditure that we had classed as opex was one-off expenditure, not ongoing, so we have carried out a detailed review and now expect to capitalise the spend.

NES.CE.A1.7

Water Industry National Environment Programme (WINEP) and other Enhancement Cost Models

Many of the Ofwat enhancement cost models calculate a modelled cost, compare it to the Business Plan costs and **use the lower of the two for the allowed cost**. We believe that Ofwat should simply set the modelled costs as the cost allowance, to preserve incentives for companies to submit efficient plans.

For example, the water lead model assesses NWL modelled costs as £11.7m, whilst the Business Plan costs are £4.0m. Ofwat have set the allowed costs as the minimum of the two. There are four other examples of this happening for NWL for the wastewater enhancements. In all these cases, NWL is effectively being penalised for submitting efficient plans.

This undermines the incentive for companies to submit efficient costs in their plans. In the example, were NWL to have submitted less efficient business plan costs, it would have received a higher allowance. The approach differs from that taken for base costs, where frontier companies can receive a greater allowance than their business plan submission, thus rewarding efficient business plan costs.

Ofwat's approach for enhancement cost modelling should be to simply set the allowed costs at the modelled costs, with some efficient companies receiving a greater allowance than their plans but most receiving less. This would preserve incentives for companies to submit efficient costs as there exists for the base cost models.

Finally, by taking the lower of the two approach in each WINEP category it is possible to submit costs that in total are below the modelled WINEP amount but still get some costs disallowed. In effect, even the frontier company will be judged inefficient.

We have separately commissioned KPMG to review the two WINEP models that cause us most concern – Phosphorous Removal and Schemes to increase flow. In both cases, we recommend Ofwat take a deep dive approach rather than using models that do not perform well under the tests KPMG have applied.

NES.CE.A2

We have updated the Water Industry National Environment Programme (WINEP) Cost Adjustment Mechanism methodology in Appendix 3.9 (February 2019) to include additional detail and to identify capex and opex against each amber scheme and cross reference to the allocated lines in tables WWS2 and WS2. This update includes amended versions of Table 2(now Table 2(a)), provision of an additional Table 2 (b), and an amended Table 5.

In summary the response is as follows:

The company has included 71 Amber schemes from WINEP (North and South) with an approximate total of £131.8M (Totex). This is summarised as follows:

	Capex	Opex	Number of WINEP lines
Total Water Quality (WQ) North (ref. Table 2(b))	£129.7M	£0.0M	56 lines
Total Water Resources (WR) North and South (ref. Table 5)	£2.1M	£0.0M	15 lines
Total Amber (North and South)	£131.8M	£0.0M	71 lines

Note: All assumed to be Capex

Our proposed WINEP Cost Adjustment Mechanism methodology has been updated in Appendix 3.9 (February 2019) and now provides costs for each Amber scheme (capex and opex) and cross reference to the allocated lines in tables WWS2 and WS2 (including amended versions of Table 1(b), Table 2(now 2 (a)), an additional Table 2 (b), and an amended Table 5.

We have proposed that there may need to be some initial spend prior to the decision not to invest e.g. feasibility study, modelling, or sampling programme. This initial spend would need to be accounted for in the adjustment.

In order to minimise abortive spend we will continue to work closely with the EA to ensure that any changes to regulatory requirements are managed and communicated in as timely a way as possible.

When scheduling implementation of our WINEP programme, we will fully consider the relative degree of certainty of each candidate whilst balancing this where necessary against deliverability and supply chain constraints.

We note the following approach linked to the area of uncertainty and the reason for the cost adjustment requirement:

- **The lack of data – additional data may become available as a result of a staged approach to delivering the obligation.** In this case it may be agreed with the EA that the original scheme is no longer required in full. This would be agreed via change protocol.

- **Lack of clarity of the scope – it may be that the EA have not been able to provide sufficient clarity at the time of WINEP publication.** The EA continue to collect additional data to support their river basin management planning process. This process is not aligned with the Ofwat business planning periodic reviews. Measures specifications detailing the obligations have been developed post publication of WINEP3 and submission of the draft business plan. It may be that additional information is made available, either locally or nationally, during this process that changes the scope of the WINEP obligation. This would need to be agreed with the EA via change protocol, but may be after some initial spend undertaken by NWG in order to meet the scheduled WINEP delivery date.
- **Potential for Policy change – Ministerial decisions may be pending and may result in a change in policy (for example, WFD decisions regarding measures for the 3rd river basin management cycle will not be made until 2021. This may result in a final decision on affordability being made that will result in the improvements no longer being supported.** The overall national WFD programme is very challenging for the supply chain. In order to meet the delivery dates, we will need to schedule an efficient delivery programme evenly over the 5 year period rather than deliver everything towards the back end, in order to meet the WINEP delivery date of December 2024. This may mean that some investment has already been made prior to ministerial decisions. The majority of our WFD wastewater improvement schemes also have a WFD No deterioration driver. These would need to be delivered regardless as they are not linked to affordability. Although, we have presented a cost adjustment mechanism for this, NW does not expect this change to be likely and propose to deliver all amber schemes associated with this uncertainty.

NES.CE.A3

Our Water Industry National Environment Programme (WINEP) included schemes for managing metaldehyde concentrations in our Drinking Water Protected Areas (DWPA). We planned to do this through “paid for product substitution” schemes whereby farmers in our target catchments, would have paid the difference between the cost of a good quality metaldehyde product and a comparable quality ferric phosphate product providing the farmer bought the ferric phosphate product. However, this scheme is now not viable because by 30 June 2020, metaldehyde purchase and its use outdoors will have been banned.

In AMP7, we will continue to monitor for metaldehyde in our rivers to pick up on any illegal use of metaldehyde and any residual metaldehyde that needs to be flushed out of the wider catchment (e.g. from ephemeral ponds). Where metaldehyde remains a problem, we will investigate the relevant sub-catchment and provide advice to land managers where appropriate to do so.
Given the above, we plan to remove all funding associated with the metaldehyde “paid for product substitution” from our Business Plan – c£1m.

We have confirmed our approach with the DWI who responded on 14 March 2019 as follows:

“Regarding your programme for metaldehyde in AMP7…paid for product substitutions schemes… is a decision for the company, taking into account the specific local challenges to drinking water quality that need to be managed to deliver and maintain compliance upto and beyond the date of withdrawl of metaldehyde from the market. The Inspectorate would expect the company to use all available means at its disposal to maintain compliance, appropriate to local circumstances. We await draft revised undertakings for metaldehyde to replace the undertakings NNE3277 and ESK3278 (and, for ESK3278, a replacement undertaking or completion report for clopyralid) as explained in our letter of 9 January 2019. We support the continuation of all catchment management initiatives throughout catchments to reduce risks to drinking water from all emerging risks”.

We are in the process of preparing draft revised undertakings for metaldehyde which will cover the approach described above, as well our successful abstraction management programme.

NES.CMI.A1

In our 2018 Business Plan we treated the funding of the 2020 RCV as fixed and we assumed all operating costs were variable. Upon subsequent review, we now have separated our operating costs between fixed and variable in line with the guidance in the action.

We have thus amended our split of fixed and variable revenue in Bio4, Block H lines 30 & 31.

Our opex has been split between fixed and variable costs:

BIORESOURCES OPERATING COSTS

£m	19/20	20/21	21/22	22/23	23/24	24/25
Fixed						
Tanker maintenance	0.548	0.517	0.511	0.505	0.498	0.493
General & Support	2.246	2.122	2.096	2.068	2.043	2.019
Rates	1.471	1.375	1.356	1.356	1.356	1.356
Total fixed (part of line 30)	**4.265**	**4.014**	**3.963**	**3.929**	**3.897**	**3.868**
Variable						
Labour	4.317	4.079	4.029	3.978	3.929	3.882
Fuel	0.746	0.705	0.696	0.687	0.679	0.671
Vehicle & driver hire	0.522	0.493	0.487	0.481	0.475	0.469
Income	-8.390	-7.929	-7.833	-7.731	-7.636	-7.545
Power	-0.854	-0.807	-0.797	-0.787	-0.777	-0.768
Chemicals/Materials	3.111	2.940	2.904	2.866	2.831	2.797
Contractor maintenance	1.692	1.598	1.579	1.559	1.539	1.521
Disposal	0.926	0.875	0.865	0.854	0.843	0.833
Other direct	0.225	0.213	0.210	0.207	0.205	0.202
Total variable (line 31)	**2.295**	**2.167**	**2.140**	**2.114**	**2.088**	**2.062**
TOTAL OPEX	**6.560**	**6.181**	**6.103**	**6.043**	**5.985**	**5.930**
Check to WWS1		6.181	6.103	6.043	5.985	5.930
Check to Bio3 & WWS1		6.181	6.103	6.043	5.985	5.930

We note that this makes variable costs around 9.7% of total revenues, which is sufficient to cover any marginal incremental costs we incur and thus incentivises additional bioresource trading.

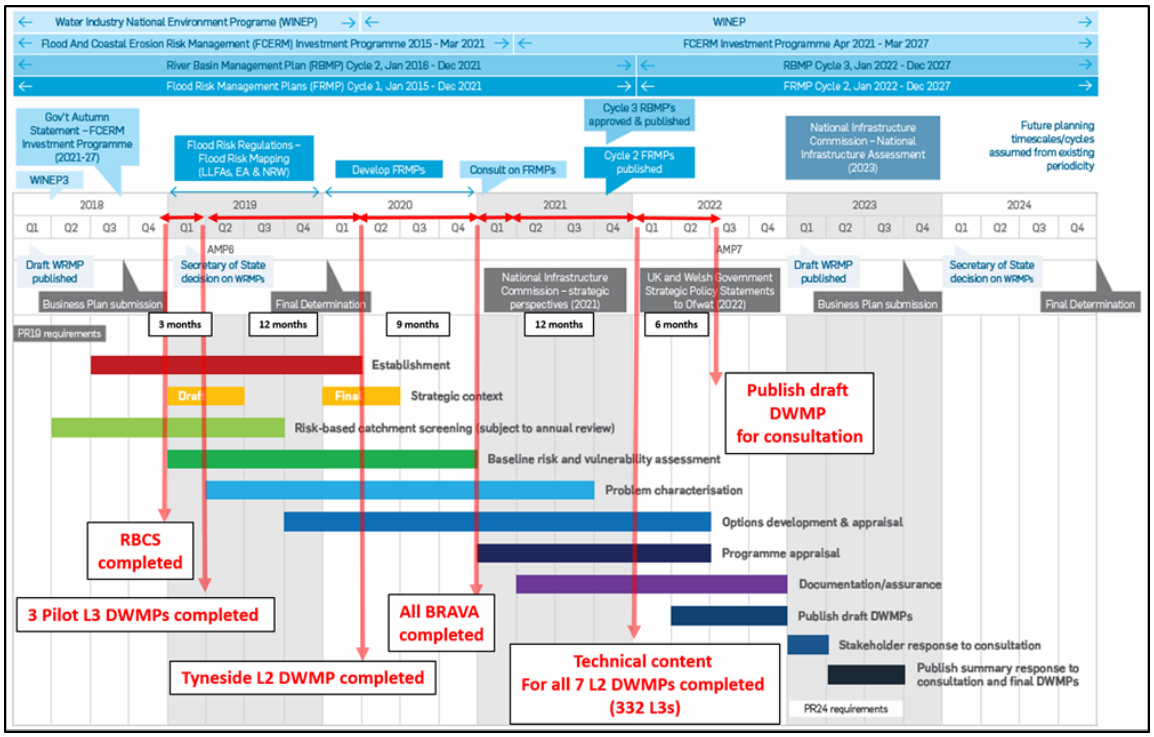
We understand Ofwat want to ensure that companies that trade in bioresources receive a cost allowance that varies with the volumes treated. We agree that most costs are fixed but there will need to be a small adjustment for the variable costs that will rise or fall depending upon volumes.

We note these are in line with the companies that have taken a similar approach, although there will be good reasons for percentages varying depending upon the treatment types and level of recent investment.

NES.CMI.A2

Through Water UK, Northumbrian Water Limited (NWL) has provided its commitment to meet the deadlines for the respective milestones which have been agreed and endorsed as part of the Drainage and Wastewater Management Plans (DWMP) framework (shown below) and are in line with other water and sewerage companies (WaSCs). NWL is committed to providing a detailed programme by August 2019 to highlight all activities associated with hitting the 2022 Q2 deadline.

The 'Options development and appraisal' step will be completed by end of Quarter 2 of 2022. NWL will be consulting on the approach throughout 2021 and 2022 with the L2 external Steering Group with a final endorsement of the programme by end of Quarter 2 of 2022 (June 22). This would enable comments to inform revised plans and feed into PR24.



NES.CMI.A3.2

Ofwat's action states: *We are intervening to disallow the water trading export incentive claim, where the net effect of the trade is to implement a reduction in the amount of water that could be imported from Thames Water rather than a net increase in exports.*

We do not agree with the approach Ofwat is now proposing.

The 2014 Thames-ESW trade is one that is beneficial for both Thames Water and Essex & Suffolk Water (ESW) customers. It is a trade that was made on a discretionary basis, with significant work carried out by both parties to agree it.

In economic terms, trading licensed capacity should be incentivised in the same way as the physical transfer of water. The trade benefits customers and is the most efficient way of addressing supply demand imbalance for Thames.

The pre-existing Thames-ESW Chigwell supply agreement was created before privatisation and exists in perpetuity. It is thus seen by ESW as a water resource that ESW paid for, inherited and effectively owns, in a similar way that ESW receives water resources from the Abberton reservoir that is outside the ESW appointed area. As this supply is fixed in perpetuity, ESW has no incentive or compulsion to change it, but instead treats it as its own resource in its Water Resources Management Plan (WRMP). The assets that supply this water, abstraction stations, pumped storage reservoirs and associated infrastructure to move the water, were paid for jointly by Thames Water Utilities (TWU) (Metropolitan Water Board) and South Essex Water Company (now ESW) in the proportion that each party had the rights to the volume of water taken. ESW are still paying for endowments that were borrowed to pay for their share.

Once ESW had expanded Abberton reservoir and created resource headroom in 2014, there was additional resource that was of value to Thames Water and its customers. ESW then looked for the most economically efficient and rational outlet to create value from this headroom.

When considering whether to allow this incentive, we suggest Ofwat should consider the following:

1 Would the trade have been allowed for an incentive were ESW to have laid a new main rather than use an existing one? If so, that would create a perverse incentive for ESW to lay a parallel inefficient supply.

2 Would the trade have qualified were ESW to export the water to a neighbour such as Affinity Water rather than Thames? If so, this would be an example of an Ofwat incentive skewing the water trading market, encouraging ESW to consider selling the water to a less economically efficient outlet that had less benefits to customers.

3 The reasoning that Ofwat has now set out in the 2019 IAP was not in the 2013 guidance on water trading incentives that Ofwat published at the time the Thames-ESW trade was made.

4 We believe the Ofwat approach is effectively retrospective, it changes the rules for a trade that was made several years earlier that qualified on the basis of the rules set out at the time. Retrospective changes undermine the confidence that the industry and customers can have in the incentives that are set by a regulator.

Guidance that existed at the time of the trade: Appendix 3, July 2013:

http://webarchive.nationalarchives.gov.uk/20150624091829/http:/www.ofwat.gov.uk/pricereview/pr14/pap_pos201307finalapproachapp3.pdf

The Key Points of the Ofwat 2013 Guidance:

Rational flows (importers and exporters)
The trading and procurement code should explain and illustrate the processes that the company has for ensuring that any trades will involve economically and environmentally rational flows. The Code should explain how the company will ensure protection of environmentally-sensitive abstraction sites.

The ESW-TMS trade is economically rational for both parties. NES customer benefit from the trade through lower bills, TMS customers benefit from lower costs.

No artificial ending of trades (importers and exporters)
The trading and procurement code should provide reassurance that there has been no artificial ending and restarting of trades to take advantage of changes in incentive arrangements.

This is a new trading agreement starting in 2014, as evidenced by the separate contract, pricing and contract length.

In their approach to PR19, Ofwat stated:

https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review-appendix-5-water-resources-control/

PR19 methodology, Dec 2017
To support water trading, we intend to maintain the existing trading incentives at the same level as PR14. ***A key advantage of maintaining the incentives is ensuring consistency with the long-term nature of water trading as a solution to promote operational and environmental resilience.*** *The water trading incentives will encourage new water trades by increasing the financial rewards for exporters and lowering the cost of trading for importers.*

The guidance thus focuses on encouraging new economically efficient water trades and does not set a conditional requirement on there being a net increase in exports.

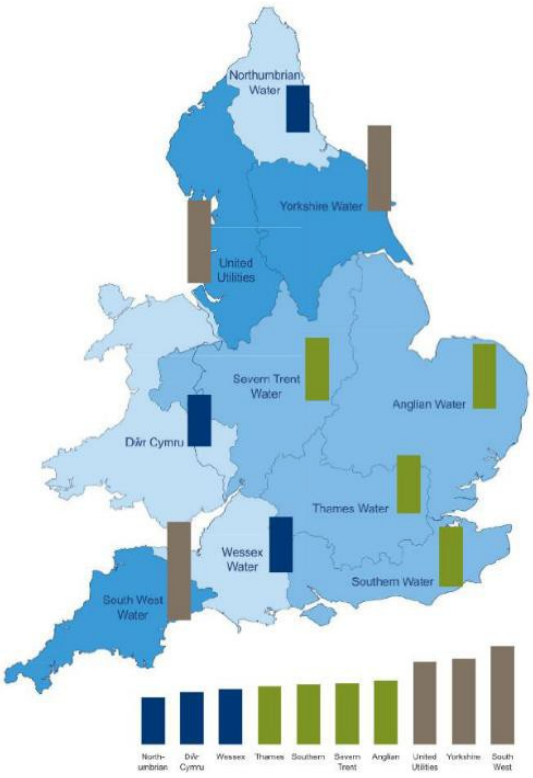
In our view, Ofwat have retrospectively changed their guidance on water trading incentives, undermining their approach to long term water trading. We believe our trade met the guidance that existed at the time of the trade and thus qualifies for the incentive.

Full details of the trade and how it complies with our Trading and Procurement Code are in our Water Trading Report, as submitted to Ofwat in 2018, and supplied in this submission. The report has three pages of additional evidence that we have added since the IAP.

We draw particular attention to the evidence on page 3 of the Report, setting out that the Chigwell supply should be seen as a part-owned resource rather than an existing water trade.

NES.CMI.B1.1

Our pioneering bioresources strategy continues to evolve and is considered to be industry leading, being an example of dynamic efficiency from innovation. We are the only company to effectively treat all of its bioresources through advanced sludge treatment with full energy recovery. This has been accomplished through two large Advance Anaerobic Digestion facilities strategically located on large sewage treatment works to provide economies of scale in bioresources processing, energy generation and the minimisation of transportation costs.



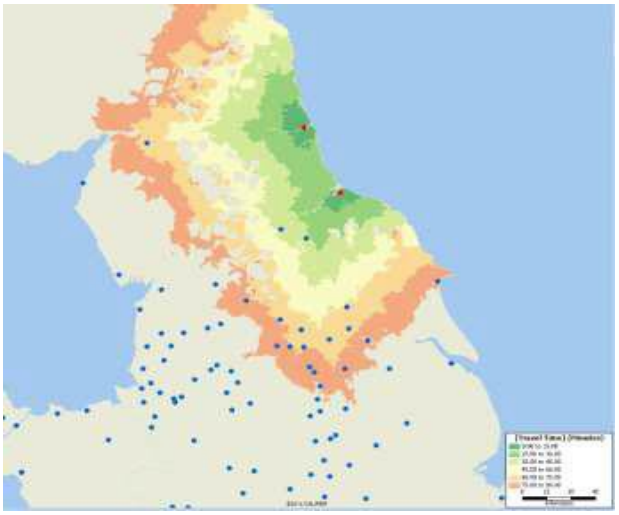
Analysis of the bioresources market highlights that currently all the treatment facilities operated by third parties in our operating region have less efficient treatment processes and in fact Ofwat's figures indicate that we are at the frontier of the water sector for bioresources. This means that we are in an excellent position to provide a leading bioresources service in a new competitive marketplace. Conversely it indicates that there would be few if any opportunities in sending our own biosolids to others in this market.

We continuously consider technical, innovative and operational choices for managing our bioresources value chain, including new emerging technologies, optimisation of existing assets, trading in the bioresources market and opportunities for further efficiencies. As an example, we are due by the end of 2019 to become the only water company to have 100% of our energy-rich biogas going through gas-to-grid. This further enables us to offer innovative technologies as part of the services we are able to offer to the market. We are actively exploring partnerships with technology providers to further enhance the offers we are able to make.

We also believe that there are other opportunities in the bioresources value chain, such as in fleet management services, optimising our current bioresources service and creating further revenues through research and innovative developments. We have introduced a Standard National Open Operators Licence (O licence) to enable trading using our Bioresources fleet and have recently insourced the haulage of biosolids to agricultural land under the brand 'NW-GROW', offering further efficiencies.

We have the ability to adjust the balance of bioresources transported into our two AAD centres by taking into account the efficient use of capacity in our bioresources assets, including that for sludge handling centres and strategic storage. This allows us to dynamically vary the capability we have available and yet further enhance the services offered.

Notwithstanding that this is a new market, we have for a number of years been actively seeking to accommodate bioresources trading from neighbouring water companies, and have been successful in this regard taking in bioresources on both a planned and unplanned basis from Yorkshire Water.



Our detailed analysis of inter-WASC trading opportunities has involved the assessment of the locality of sewage treatment sites across our operational boundaries, including haulage distances from our two large AAD facilities and the practicalities of road transportation routes. We will continue to support the market development in bioresources through sharing market information and actively participating in trading platforms.

We also have experience, as part of our commercial operations, in the provision of bioresources services for third parties. We operate a number of wastewater treatment facilities in Scotland (Ayrshire and Fife) and in Ireland (Cork), three of which include bioresources/sludge treatment, both anaerobic digestion and thermal technologies. In addition, we have also commissioned a farm-waste AD facility in Leeds, including energy recovery through CHP and gas-to-grid biomethane injection. This will enable us to offer sludge based services as well as a gas injection point to support the monetisation of third party biogas.

We extensively collaborated with Yorkshire Water, through our ongoing bioresources trading relationship, in their 2018 Bioresources Market Testing of the collection, treatment and recycling of bioresources to offer them resilient, innovative and efficient solutions. This activity was led by our Commercial team, who together with our Bioresources Management team, have experience and expertise in the development, installation and operation of innovative, resilient and specialised solutions. We are keen and willing to take arrangements forward on a commercial basis should YW (or other organisations) decide to take such arrangements further taking advantage of our efficient approach in this area.

Overall we are committed to developing long-term contracts and further trading opportunities as the market for bioresources evolves. Where this requires increased capacity in our bioresources processing chain, we will develop and fund this in partnership under commercial arrangements that protects and benefits our customers.

NES.CMI.B1.3

We are surprised by this question, as we are widely regarded by the Environment Agency and other stakeholders as the industry leader in partnership working for the delivery of sustainable drainage solutions. This is evidenced by the multi award winning project at Brunton Park, a UK reference site.

We would refer to Section 2.3 of our Business Plan, page 42 where we describe how our stakeholders have shaped our plan. Under this section, we highlight how through the "Thinking ahead workshops" carried out both in the North and South, we have engaged with a number of stakeholders that recognise our ambition of working in partnership to deliver sustainable solutions and furthermore we highlighted as an example our award winning partnership approach, the Northumbria Integrated Drainage Partnership (NIDP). This is a unique set up, facilitating opportunities for integrated partnership approaches through Risk Management Authorities, in the North East, looking at tackling a number of flooding issues predominantly through sustainable drainage solutions.

In section 3.3 of the Business Plan, Page 129, we refer to our award winning NIDP approach, where we mention the work with our 13 partners in the region to identify common goals and so far we have delivered a number of schemes in partnership to address flood risk and built sustainable drainage solutions which provide a number of other benefits such as increased biodiversity, improved water quality and recreational value at a lower cost than that of traditional solutions.

In section 3.5 of the Business Plan, Page 167, we refer to our improving the environment scheme, where our ambition is to improve access to the environment and we provide the example at Great Ayton how in partnership, the scheme will contribute to the implementation of sustainable drainage solutions.

Section 3.3 of the Business Plan, Page 127, refers to our Rainwise Approach where we work with our communities to reduce the risk of flooding. The interventions range from small scale to large scale, looking at a range of sustainable drainage solutions working with a diverse range of partners. Since 2015, our Rainwise campaign has delivered flood risk reduction to over 4000 properties.

Judges at the Water Industry Achievement Awards for the Utility of the Year Award 2017 were impressed with our work to deliver sustainable drainage solutions through our partnership approach. (Page 273 of the Business Plan). Phil Rothwell, Chair or the Northumbria Regional Flood and Coastal Committee, also commented that "Working together to create integrated and sustainable flooding solutions to tackle flooding from all its sources gives better outcomes for customers and means efficient delivery of projects resulting in better value for money", adding that "the North East is a great example of partners working together to reach shared goals and I'm delighted the NIDP won the Partnership Working Award at the 2018 Project Excellence Awards as it recognises these efforts."

Judges for the 2018 Project Excellence Awards at the Flood and Coast 2018 Conference were also impressed by the multi-agency partnership and joint programme delivering 20 schemes, reducing risk to over 1,000 properties. They praised the strong community partnership links particularly with local schools and how the partnership was not just about funding but a true delivery collaboration where partners spoke with one voice.

Furthermore, the Environment Agency (EA) have described our approach as nationally leading.

Our ambition in AMP7 is to build on these strong partnerships and work on establishing new ones such as with LEPs, RTPI, Health Service and a number of other partners that we have identified through our stakeholder engagement on the Drainage and Wastewater Management Programme to deliver sustainable drainage solutions.

NES.LR.A1

There are four parts to this action so our response addresses each in turn, beginning by clarifying which measures we have identified as key resilience indicators. We explain how we identified our operational resilience measures in the context of understanding our operational resilience risks and follow this with an explanation of how these measures will stretch us to enhance our operational resilience in AMP7 and beyond. We finish by signposting new content we are providing as part of our business plan resubmission on outcome delivery incentives (ODI).

1) Defining the Performance Commitments (PCs) associated with operational resilience

We have drawn out more clearly which of our PCs we consider to be the lead indicators of our operational resilience with some new commentary on page 103 of our business plan. These PCs are:

- Percentage of population at risk of experiencing severe supply restrictions in a 1 in 200 year drought.
- Percentage of the population at risk of flooding in a 1 in 50 year rainfall event.
- Event Risk Index.
- Interruptions over 12 hours.
- Repeat sewer flooding.

We are developing enhanced metrics relating to resilience and we are funding a PhD with the University of Exeter to support the development of resilience strategies and metrics (see page 95).

Line of sight between resilience measures and risks

As we explained in our business plan, the starting point for developing our resilience framework, including our resilience measures, was to understand our resilience risks, starting from our approach to corporate risk management. We identified eight areas in our business plan (pages 98-103) where we needed to strengthen our operational resilience which were:

- Long term planning
- Growth
- Environment, climate change and catchment solutions
- Resilient business systems
- Asset health
- Emergency planning
- Critical site resilience
- Water and wastewater resilience.

Each of these areas align to either a proposal for enhancement investment or to our PCs. We were clear that enhancement funding was to be separate from delivering outcomes to avoid customers paying twice for interventions through both enhancement funding and delivery incentive payments.

The majority of these areas are linked to enhanced investment programmes. Two areas in particular link more to our resilience performance commitments as explained below.

Environment, climate change and catchment solutions

We stated in our business plan that climate change is one of the greatest challenges we face. It has particular potential to affect customers' water supplies and sewer flooding. Four of our resilience measures will help us to monitor our ability to cope with climate change and extreme weather events generally. These have been selected based on a combination of those aspects of service most important to our customers (sewer flooding), key challenges facing the industry (drought resilience), along with Interruptions > 12 hours which is an effective measure of our ability to maintain supplies during extreme weather events, for example the 2018 freeze/thaw.

i) Percentage of population at risk of experiencing severe supply restrictions in a 1 in 200 year drought. Performance shows the proportion of our customers who are sufficiently protected against extreme weather or changing weather patterns.

ii) Percentage of the population at risk of flooding in a 1 in 50 year rainfall event. Performance shows the proportion of our customers who are sufficiently protected against extreme weather or changing weather patterns.

iii) Interruptions over 12 hours. Performance shows how well we are prepared for and respond to extreme weather events.

iv) Repeat sewer flooding. Performance shows how well we are prepared for and respond to extreme weather events.

Asset health

We have identified 11 of our performance commitments as measures of asset health (see our response to action NES.LR.A3 which clarifies which these measures are and how they demonstrate the health of our assets). Maintaining good asset health will continue to be a challenge for us given our ageing asset base and the importance of asset reliability to our resilience. Three of the asset health measures are also resilience measures. These are:

v) Event Risk Index. Performance reveals the resilience of our supply system in terms of the reliability of treatment and network assets and also whether we have sufficient redundancy in place to protect service in the event of asset failure.

vi) Interruptions over 12 hours. Performance indicates the reliability of our strategic network assets; whether we have sufficient redundancy to protect service in the event of asset failure and how well we respond to and recover from strategic asset failures when they occur.

vii) Repeat sewer flooding. Performance indicates where we have failed to sufficiently protect customers from a high risk of sewer flooding.

Ensuring our resilience PCs are sufficiently demanding for AMP7 and the long term

The measures which we have identified to track our operational resilience will place new demands on the way we plan our services and stretch us during AMP7 to increase our focus on anticipating threats and preventing significant events or service failures from occurring. Although there are many ways in which we already do this, we recognise we need to go further. Our resilience measures will stretch us to anticipate and prevent failure in different ways.

1 in 200 year drought – ensuring our water supplies are always reliable
We are already in a robust position when it comes to the sufficiency of our water resources and this means that the risk of supplies being affected by a 1 in 200 year drought is low for the majority of customers we serve in our operating areas. However, the whole supply network from source to tap needs to be able to cope with drought. As we said in our business plan (on page 116), there is scope to improve our ability to transfer and treat water from different sources across our regions which leaves some communities more vulnerable to the effects of drought than others. This measure will stretch us to look at more extreme weather scenarios and plan our services to ensure they are resilient enough to cope with unusually extreme weather or more permanent changes to weather patterns that may come with climate change.

Risk of flooding in 1 in 50 year rainfall event
This measure will stretch us to protect customers in ways that go above and beyond our historic approach to investing against the risk of flooding. Where appropriate and in the best interests of our customers, it will take account of the risk of flooding from all sources (including surface water and rivers) identified in partnership with other Risk Management Authorities. This holistic catchment approach will, in some instances, lead to implementing collaborative solutions which ensure that we provide our customers with best value and benefit from our investment.

The common measure is a key part of our Drainage and Wastewater Management Plans, which have been developed nationally in response to the need to improve the water sector's approach to long-term drainage and wastewater planning. This will provide greater transparency, robustness and line of sight between the identification of risks and investment decisions.

We have proposed a challenging performance commitment for AMP7, significantly reducing our risk from 35.17% in 2018/19 to 22.00% by 24/25.

Event Risk Index (ERI)
We have always been committed to Water Quality, and support the introduction of both the CRI and ERI measures. Our initial ERI scores range from 100 to 300 and we are committed to reducing our score to 10.8 by 2024/25. This will require us to improve the resilience of our supply systems in a number of ways which will include:

- Improved containment of events in order that fewer customers are exposed to water quality risks.
- Identification of any single points of failure and subsequent mitigation on a risk basis.
- Ensuring further improvements to the competency of our people to further lower the possibility of introducing water quality risk, or inflating the scale of an ongoing water quality issue.
- Ensuring we have sufficient redundancy in our asset base, both in terms of treatment processes and assets as well as network connectivity, with the capacity to move wholesome water to wherever it is needed.

Interruptions >12 hours
By comparison with other companies we have performed well on interruptions over 12 hours for many years. However, we will not prevent large scale interruptions from occurring in future simply by maintaining our current practices. Having this measure in place will demand that we address community vulnerabilities which result from poor network connectivity; reveal how well we manage the impact of new threats when they develop; and show how well we are prepared to respond to critical asset failures in a way that prevents them from developing into significant service failures.

Repeat sewer flooding
Our measure of repeat sewer flooding counts incidences of internal sewer flooding which have recurred at the same property within a 10 year period. The measure will be more focused on resilience from 2020 as it will include flooding incidents which have occurred as a result of severe weather. It will therefore stretch us to consider the effects of climate change and extreme weather on our catchments and require us to invest appropriately to maintain the integrity of our assets and levels of service to our customers and the environment.

We have revised the definition of this performance commitment to make it more transparent for our customers and have set challenging targets to achieve a 35% reduction in repeat sewer flooding by 2024/25.

Incentives for resilience PCs
Our approach to incentives is covered in responses to actions NES.OC.A2, A4 and A5.

NES.LR.A3

We see merit in the industry and Ofwat working together to develop common agreed measures of resilience and asset health, with an objective for this to be concluded in good time to feed into PR24.

We have added some text to our business plan with a list which more clearly identifies our asset health measures. Together with this we make a statement that we are committed to working with the industry to further develop more sophisticated measures of asset health.

We will do this by:

- Building on the progress we have made with our 'state of our assets' report by sharing our findings with other water companies in order to encourage and enable more comparison and benchmarking of best practice. The first step to developing suitable asset health metrics will be to build a better picture of the health of our assets and how this compares with other companies assets.
- Continuing to meet with other water companies on the subject of asset health. We intend to play a leading role in shaping suitable metrics for use across the industry by initiating a new industry forum which focusses on asset health.
- Continuing to work with the Institute of Asset Management on the subject of asset health; looking to learn from experts from other sectors outside the water industry and how they approach asset health. The Institute's patron's forum has accepted our proposal for a new research topic of 'system health' which takes asset health to the next level. Systems are connected assets where the performance of one asset within the system can potentially impact other assets in a cascade effect. Being able to understand or predict this will significantly improve our efficiency, service and forward planning. The goal of the research will be to build metrics and approaches to determining and quantifying system health.

How our asset health indicators influence operational decision makingAt present, there are a number of methods we use to understand health of assets and to optimise an appropriate level of operational intervention to enable the assets to perform and deliver service to customers:

- Performance is monitored through our company scorecard;
- We measure the balance of investment against company performance for asset groups;
- We use predictive modelling (e.g. deterioration models);
- Reactive investment levels are monitored;
- An overall assessment of risk to service is made on the basis of identified investment needs;
- Risk and benefit to performance is quantified for all investment;
- We monitor the extent of operational activity required to manage risk/performance;
- We carry out asset inspections and condition assessments.

All of this information is used in order to build up an investment programme which manages performance and balances risk across our asset base.

As we said in our business plan, we are in midst of transforming our approach to asset management through our Intelligent Asset Management programme. This will bring significant changes to the way we approach asset health and decision making around this:

- Our new Maximo system will capture significantly more data on the performance of our assets and their condition that will allow us to understand trends in asset performance and health. We will significantly enhance our data sets on condition, failure codes (problem, cause, remedy) and asset history. All work on our assets will instigate an assessment of condition after intervention.
- Enhanced data sets will increase our accuracy of performance deterioration modelling for all above and below ground asset groups.
- We are in the process of implementing a Target Operating Model which will establish a new Asset Intelligence team. This function will drive our asset management journey forward and achieve leading position in the maturity scales, embedding intelligent asset management and driving asset management continuous improvement. This team will be the business 'conscience' for asset health and future fitness of our asset base and will be an independent cross check that in all areas we are making robust and resilient asset management interventions. They will bring together the focus on high quality and reliable asset information for all and in turn support detailed understanding and analytics of our approach towards operating, maintaining and replacing our asset base; covering optimisation, reliability and deterioration modelling. They will understand our service risk levels across our asset stock and how this will change over time to support the operational services decision making and service planning.
- Within Asset Intelligence we will be building a new capability of Reliability Engineering to lead work on asset health:
    - Life cycle cost analysis of assets to support decisions on maintaining, operating and replacing assets.
    - Intelligent planned preventative and predictive maintenance using asset condition assessments and modelling on our asset base.
- We have been doing some benchmarking with others on approaches to building dashboards for Operations and Maintenance teams which display asset health. IBM are doing some work on this for us too.

We will provide further detail around how our approach to asset health is developing as part of the action plan for embedding a systems based approach to resilience (action NES.LR.A2).

NES.OC.A31

The justification for applying an outperformance payment to mains bursts, is that we have robust evidence of customer support for such a payment, based on the fact the bursts can cause local flooding and traffic delays.

Evidence of this support, based on the associated customer engagement, is described in more detail on page 159 of Appendix 2.2 accompanying our plan. In summary:

> This engagement took place in five locations, across our operating areas. Five hundred household customers participated. We also conducted an online survey with 120 non-household customers, asking them to consider the wholesale portion of their charges in relation to bespoke Outcome Delivery Incentives (ODIs).
>
> Participants were shown a video which explained that some potential rewards had already been decided by other customers. These amounts were shared with participants for context and it was made clear that they would not be able to influence or alter those amounts in any way. Each of our additional measures (eight NW, three ESW) was then introduce in turn. In regards to water mains bursts participants were informed that;
>
> > *A water main is a large underground pipe used for supplying water to houses, businesses and other properties. Sometimes water mains burst. This can cause the surrounding area to flood, local homes and businesses to be without their water supply for a period of time and depending on where the burst is its repair can result in local delays to traffic, due to roadworks, while the water main is fixed.*
>
> Participants were then taken to an individual table, with a board showing the potential areas for ODIs. They were asked to allocate some plastic coins to the measures they felt we should receive a reward for if we became the best company for delivering that service. It was made clear to participants that they could allocate as much or as little as they liked (including nothing) to each measure. This allowed us to gather valuations that stand up alongside those from our service valuation tool in a way that is robust.

The resulting valuations were used to set our incentive rates, in line with the equations set out in the methodology. This is described further in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

NES.OC.A1

When developing our business plan for 2020-25, we chose to discontinue four of our current reputational performance commitments (PCs):

- R-C1: NWL independent value for money survey
- R-C2: Satisfied with value for money of water services – Northumbrian region
- R-C3: Satisfied with value for money of sewerage services - Northumbrian region
- R-C4: Satisfied with value for money of water services - Essex & Suffolk regions

We replaced them with PCs that we consider to be more relevant to our strategy for affordable and inclusive services, as set out in chapter 3.2 of our plan, especially our ambitious goal to eradicate water poverty in our operating areas by 2030. These new measures focus on affordability and value for money for customers who need additional support. These are issues that matter to our customers.

We welcome Ofwat's challenge to provide sufficient evidence to justify discontinuing our PR14 Value for Money PCs. It has given us the opportunity to reflect on whether the decision we made to discontinue with them was justified.

In response we propose to reinstate the NWL independent value for money survey as a PC for PR19. This will make sure that we are measuring the satisfaction of all our customers and not only those that receive additional support. This is the more statistically robust measure of the four, and is also conducted more frequently - enabling us to respond more rapidly to any changes.

Our scores in our independent value for money survey have remained consistent over the last four years, surpassing our PC and demonstrating that we have maintained our customers' overall satisfaction with value for money since 2015. We hope this will improve further as we deliver significant bill reductions in AMP7.

Our PC for this reputational measure - independent value for money survey between 2015-20 is 7.9 out of 10. For the last four years (2015, 2016, 2017 and 2018) our performance has been 8.2 out of 10. We will, therefore, set our PC at 8.2 out of 10 for the 2020-25 period.

The PCs that we will use during 2020-25 are:

- Percentage of households in water poverty
- Awareness of additional support
- Satisfaction of customers who receive additional support
- Percentage of void household properties
- Non-household gap site matching
- Independent value for money survey

We do not believe it is necessary to continue using the CCWater value for money measures, as the suite of measures that we now have for affordable and inclusive services will drive performance and services improvement for all our customers. Retaining the CCWater measures would be confusing and result in duplication.

The suite of measures that we now have will result in further improvements for all our customers, and in particular those who find themselves in circumstances that may make them vulnerable. This is consistent with our inclusivity strategy.

We expect that CCWater will continue to publish their satisfaction with value for money measures annually through Water Matters. Hence the results will continue to be available for our customers and stakeholders to scrutinise. Furthermore the timing of the publication of the CCWater results are not within our control, and may not be in line with the publication of our Annual Performance Report. It is more appropriate that we adopt measures that we can make sure can be published accurately within our Annual Performance Report.

NES.OC.A2 + NES.OC.A5

Our Outcome Delivery Incentive (ODI) package incentivises us to deliver our Performance Commitments (PCs), aligning the interests of management and shareholders, as follows.

Firstly our ODI package is aligned with customer interests as it has been built bottom up based on high quality customer engagement and evidence. A key part of this was our service valuation tool, which presented service and incentive options to customers in a more cognitively accessible way than in previous willingness to pay surveys, based on a behavioural economics approach. Fundamental to this was presenting the choices to customers in the context of their own bill. Particularly important was a period of customer testing, which resulted in a number of refinements being made to the tool to improve customer understanding prior to it being used "for real". Our detailed approach can be found in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

Further research was undertaken with customers to inform incentive rates for a number of our bespoke measures. A full write up of our approach can be found in Appendix 2.2.

Where appropriate the values obtained were triangulated against other sources, including those obtained from PR14. Full details can be found in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

This includes detail of further triangulation we have conducted since receiving the Initial Assessment of Plans (IAP). Specifically for common PCs, where we have compared our own valuations with the industry range in Ofwat's Technical Appendix 1. As a result, where appropriate, we have moved our incentive rates to the nearest point in the industry range.

This final piece of triangulation also addresses a challenge that, in some areas, our incentives package may not adequately incentivise us against under performance. Specifically our penalty rates for internal flooding, external flooding and collapses have increased. When combined with tighter PC levels in each instance in response to queries NES.OC.A20, A54 and A41 respectively, this provides a powerful incentive to achieve targets.

As a package, our overall ODI range is consistent with views expressed by customers as part of our service valuation research, and also as part of our acceptability research. Both studies were based on a statistically representative sample of customers. The latter resulted in a very high level of acceptability of 91%. Full details of our approach to acceptability can be found in Appendix 2.2.

As well as basing our PCs and ODIs on customer evidence, our package of incentives further aligns management and shareholder interests with those of customers, and also provides even stronger incentives to achieve targets as a result of:

a. All of our ODIs being linked to revenue, making payments more immediate and closer in time to the performance that triggered them, as opposed to RCV adjustments where the impact is felt gradually over a number of years. This strengthens the link between performance improvements for customers and shareholder returns.
b. Executive pay being linked to our balanced scorecard performance, and hence outcomes for customers via our Short Term Incentive Plan (STIP).
c. The overall range of -1.83% to 1.35% of RoRE being within Ofwat's indicated range – again providing a powerful incentive to achieve targets.

A key part of aligning management and shareholder and customer interests, particularly with regards to improving service levels across the industry in the longer term, is our approach to enhanced incentives. This is described in more detail in response to other actions. In summary, however, we believe our approach to enhanced rewards and penalties provides a strong incentive to raise industry standards. The strength of this incentive is all the more important given the level of stretch elsewhere in business plans. Subsequent to the IAP, our approach to enhanced incentives has been tested further with customers. This is set out further in our response to NES.OC.A4.

Finally, to protect customers from higher than expected rewards, thus maintaining affordability, we have introduced a set of caps and collars, in response to other specific IAP actions specifically NES.OC.A7 along with additional PC specific actions.

Our approach to using marginal costs in our ODI calculations is set out in full in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1. With regards to the specific points mentioned:

a. We have not made any cost adjustment claims.
b. Our two enhancements which related most closely to our ODIs (Smart Sewer Network and Proactive Risk Reduction) were disallowed in Ofwat's Initial Assessment. We have removed the former from our resubmission, however we have retained the latter. We are strengthening our case that this is not directly linked to ODIs, but is focused on addressing long term flood risk in relation to climate change.

NES.OC.A4

We believe our original approach followed Ofwat's premise for enhanced incentives, in that raising the bar on performance levels raises the standard for the whole industry.

The approach outlined in our business plan was thus based on the ratio of the size of our customer base to the sum of all companies' customer bases. This resulted in a multiplier of x 20. Such an approach, however, would result in unreasonably large multipliers for small companies, so we recalculated the multiplier based on how this approach would work for the largest company, Thames Water, which resulted in a more appropriate answer of x5.

Regarding the observation that our proposed rates would exceed customers' willingness to pay (WTP): If the equation for calculating standard incentive rates advocated by Ofwat in Appendix 2, page 91, of the final methodology is followed, then any multiplier for rewards (including x2) will result in the incremental benefit/WTP for that individual performance commitment being exceeded once the impact of the totex efficiency sharing mechanism is taken into account. A multiplier of x2 is no more or less valid than x5 in this regard.

The justification for enhanced rewards is that they are beneficial for customers "in the round". WTP may be exceeded on individual measures, however at the same time one company's customers will also benefit from performance improvements delivered by other companies in response to the enhanced incentives approach – which they will not have to pay for. This argument is once again consistent with Ofwat's own logic, in section 3.4.4, Appendix 2 of the final methodology, used to defend its position on enhanced incentives, as well as being consistent with our original approach.

We also believe this is consistent with the approach used by Ofwat to assess the impact on the industry/customers of small company mergers, i.e. what is the dis-benefit of losing a frontier performer. One such example was the acquisition of Bournemouth Water by Pennon Group. Below is a link to that report.
https://assets.publishing.service.gov.uk/media/55964ba940f0b61564000012/Ofwat_initial_submission.pdf

We have subsequently explored the approach in this Ofwat report further and followed some worked examples using the same approach set out on pages 58 to 69 of the report, i.e. calculated the impact on future industry upper quartile if we improve performance beyond our proposed enhanced thresholds, and in turn what beneficial impact (for customers) raising the upper quartile then has on future rewards and penalties paid across the industry. Naturally such examples are sensitive to the exact spread of company performance figures in play at the time of the analysis, nevertheless on average these worked examples resulted in an average multiplier of x5.02. Further detail can be found in Appendix NES.OC.A4 – Additional Evidence – Appendix 1.

It is of the utmost importance to us that our plan is aligned with the views of customers. We informed our approach using robust service valuations from customers (from our service valuation tool) as well as other sources. This is explained further in response to NES.OC.A5 along with Appendix NES.OC.AC. Critically, in our acceptability research we shared the range of our ODI incentive package, using the x5 multiplier. This resulted in 91% acceptability.

Given Ofwat's feedback, we have sought to conduct further independent customer engagement on this subject. This has provided us with two further qualitative reference points:

- When discussed in an abstract sense, customers on average selected a multiplier for enhanced rewards of x2.78.
- When discussed in the real sense of what it would mean for bills in practice, the majority of customers (66%) supported a multiplier of x5.

Full details of this research can be found in 'NES.OC.A1-74 - Additional Evidence - IABP Additional Engagement Research Report'.

Elsewhere in our plan we have also responded to Ofwat's challenge on Customer Protection and Caps and Collars, thus protecting customers from any risk of higher than expected rewards – which was minimal in any case based on our best case performance projections. Finally we agree that enhanced incentives should only apply to genuinely stretching performance levels. We articulate our approach to both these items in detail in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

In summary, we believe that our original proposal for a x5 multiplier is an appropriate incentive to strive for new standards of performance. It is consistent with not only Ofwat's premise for enhanced rewards, but also the calculations Ofwat itself uses in other circumstances, and is supported by our customers.

Given the level of stretch in company business plans, especially in relation to totex and service levels, it is all the more important to maintain strong incentives for outperformance. In these circumstances it is likely that a multiplier of x2 will be insufficient incentive for companies to shift the frontier.

NES.OC.A8

We are very supportive of the principle of upper quartile (UQ) targets for common performance commitments (PCs). On this basis we are happy, in principle, to adopt consistent UQ targets once calculated.

The fact that these UQ targets are based on projected (not actual) performance, creates a need to check that any performance projections in companies' plans are credible and deliverable, particularly as very stretching projections by a small number of companies have the potential to significantly skew the UQ position.

We have checked the details of two companies' projections which are having a significant bearing on the UQ calculation:

> Yorkshire Water has set a PC of 3m:0s by 2024/25, however an under performance dead-band has been set at 6m:0s. While we are pleased to see that Ofwat has now challenged this dead-band, its inclusion (by definition) indicates some uncertainty with regards to achieving the proposed PC.
>
> Bristol Water has average performance from 2010/11 to 2017/18 of 43m:14s. Even if two outliers in 2014/15 and 17/19 are removed, this still gives an average performance of 19m:30s. In relation its proposed PC level of 01m:48s in 2024/25 is extremely stretching.

If we assume that Yorkshire performs at the level of its proposed dead-band, and Bristol achieve an only slightly less substantial improvement which places it just below UQ, then this adjusts the UQ projections to 5m:0s in 2020/21 tightening to 3m:58s in 2024/25.

This represents a significant shift from Ofwat's proposal of 4m:17s tightening to 3m:0s.

In summary we believe it vital that Ofwat performs appropriate checks on the credibility and deliverability of performance projections, and makes any appropriate adjustments, prior to using these projections to determine UQ targets for the industry. We believe that these checks are of the utmost importance in order to maintain the credibility of an incentive regime based on comparative performance - especially as the business plan assessment process creates an incentive for companies to make optimistic projections.

NES.OC.A09, NES.OC.A10, NES.OC.A11, NES.OC.A12, NES.OC.A13, NES.OC.A14, NES.OC.A15, NES.OC.A16, NES.OC.A17, NES.OC.A18, NES.OC.A21, NES.OC.A22, NES.OC.A23, NES.OC.A26, NES.OC.A28, NES.OC.A29, NES.OC.A30, NES.OC.A32, NES.OC.A33, NES.OC.A34, NES.OC.A37, NES.OC.A38, NES.OC.A43A, NES.OC.A45, NES.OC.A53

The above responses are answered in full in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1, which sets out our approach and all the associated calculations in considerable detail.

We have provided a greater level of evidence regarding the calculation of our incentives rates, this includes:

- The creation of our Service Valuation Tool and the cognitive testing we completed with our customers.
- Results from additional customer engagement we completed with Explain Market Research. This also included an additional online exercise which over 3,000 participants engaged in.
- Details of the additional research we have been able to conduct post IAP.
- Further evidence to indicate how our survey participants' valuations drove the calculation of our incentives – bottom up. We include evidence of how our marginal valuations and marginal costs were derived and how we have applied the Ofwat incentive formulas across each measure.
- The triangulation we have undertaken to factor in the information we have, including Ofwat's Technical Appendix 1 to derive any new levels of service, incentive rates, caps, collars, enhanced thresholds etc.

We have reviewed the Technical Appendix 1 document and triangulated any information / data with our own customer research. We have also considered the levels of service, incentives etc that have been agreed with Ofwat and the three fast track companies. Within the Ofwat Technical Appendix 1 there are some clear methodologies that we have applied to our calculations:

- We have applied the Ofwat defined Upper Quartile (UQ) positions for performance: Internal Flooding, Interruptions to Supply 3 Hours and Pollutions.
- Where our customers' valuations of service did not fall in the acceptable range defined by Ofwat, we have moved our incentive rates to the nearest point on the scale derived. Therefore some of our incentive rates have increased and some have fallen.
- Where necessary we have applied caps and collars to measures, whilst we have also considered the position of the levels of service required to achieve enhanced incentives.

Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 reviews every measure where Ofwat has posed a query, detailing any information and triangulation we have used to consider the request and then provides an Outcome which is used within our App1 tables.

Within this Appendix we also provide detail to queries such as defining our asset health measures

(also in App1) and the % RoRE that our P10 and P90 positions create by each of those measures.

NATURE OF ADJUSTMENT
NES.OC.A09, NES.OC.A10, NES.OC.A11, NES.OC.A12, NES.OC.A13, NES.OC.A14, NES.OC.A15, NES.OC.A16, NES.OC.A17, NES.OC.A18, NES.OC.A21, NES.OC.A22, NES.OC.A23, NES.OC.A26, NES.OC.A28, NES.OC.A29, NES.OC.A30, NES.OC.A32, NES.OC.A33, NES.OC.A34, NES.OC.A37, NES.OC.A38, NES.OC.A43A, NES.OC.A45, NES.OC.A53

For data within this Appendix we have applied Ofwat's methodology of using conversions from 2022/23 data such as connected properties and kilometres of mains or sewer network.

Below indicates the page reference in NES.OC.A1-74 where the relevant information for each action can be found:

NES.OC.A09, NES.OC.A10, NES.OC.A11:	p14 onwards
NES.OC.A12, NES.OC.A13, NES.OC.A14, NES.OC.A15, NES.OC.A16, NES.OC.A17:	p16 onwards
NES.OC.A18:	p31 onwards
NES.OC.A21, NES.OC.A22, NES.OC.A23:	p22 onwards
NES.OC.A26:	p13 onwards
NES.OC.A28, NES.OC.A29, NES.OC.A30:	p27 onwards
NES.OC.A32, NES.OC.A33, NES.OC.A34:	p37 onwards
NES.OC.A37, NES.OC.A38:	p35 onwards
NES.OC.A43A	p36 onwards
NES.OC.A45	p34 onwards
NES.OC.A53	p39 onwards

NES.OC.A20

We have adjusted our performance commitments to match the values calculated by Ofwat for Upper Quartile (UQ).

The changes are as follows:

Original business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
No of Incidents	**400**	**355**	**305**	**255**	**249**	**242**	**236**	**229**

Proposed revised business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
No of Incidents	**400**	**500**	**305**	**217**	**212**	**207**	**189**	**177**
Per 10,000 props	**3.16**	**3.93**	**2.38**	**1.68**	**1.63**	**1.58**	**1.44**	**1.34**

However, we would also draw Ofwat's attention to our response to NES.OC.A8, with regards to checking the credibility and deliverability of companies' performance projections prior to using them to set UQ targets, and request that the same checks are made in relation to this PC.

NES.OC.A25

We confirm that we have adopted the standard definition in full for this revised submission, including providing all of the information set out in section 3.6 of Developing and Trialing Wastewater Resilience Metrics (Atkins for Water UK).

Following further industry clarification on this measure, we have updated our proposed performance commitment (PC). We will submit our methodology for how we have determined our baseline figures with our revised submission, in line with the standard definition.

Our changes to the PC are:

Original business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Population at risk	**16.3%**	**16.25%**	**16.23%**	**16.21%**	**16.17%**	**16.11%**	**16.05%**	**16.03%**

Proposed revised business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Population at risk	**35.17%**	**35.17%**	**35.17%**	**32.3%**	**29.8%**	**27.3%**	**24.8%**	**22.0%**

NES.OC.A27

We have adjusted our Performance Commitments (PC) to match the values calculated by Ofwat for Upper Quartile (UQ).

The changes are as follows:

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Per 10,000 km		25.01	25.01	24.01	22.35	20.34	18.01	14.34
No of Incidents		74	74	71	66	60	53	42

Proposed revised business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Per 10,000 km		25.01	25.01	24.51	23.74	23.00	22.40	19.50
No of incidents		74	74	72	70	68	66	57

NES.OC.A35

Unplanned outage is a new measure for Northumbrian Water Limited (NWL).

The outage assessments that were undertaken for water resource management planning purposes are different to this definition. We have been on a learning journey and are making changes to ensure that we are fully compliant with the reporting definitions before 2020.

There are six areas to monitor to be able to confidently report our unplanned outage. At Annual Performance Report (APR) 2018 our shadow assessment was:

1 Peak week production capacity; amber
2 Unplanned outage; red
3 Planned outage; red
4 Duration; red
5 Reduction in capacity; red
6 Exclusions; red

In March 2019 our shadow assessment was improved across all areas:

1 Peak week production capacity; green/amber
2 Unplanned outage; amber
3 Planned outage; green
4 Duration; amber/green
5 Reduction in capacity; amber
6 Exclusions; amber

Work is underway to have consistent reporting in both our Northumbrian Water and Essex & Suffolk Water regions. We are confident that consistent reporting will be in place for 2019/20 performance data. For 2018/19 duration and capacity improvements are taking place through data capture improvements where new SCADA screens are being implemented. This will also allow details to be recorded in our internal information system - MIPS as a permanent record of the duration and outage impact (Ml/d reduction).

Please see the table below on the following page. A more detailed excel plan can be found at ‘NES.OC.A35 - Additional Evidence - Unplanned Outage 2018-19 work plan.’

1 Peak Week Production Capacity	Component	2017 / 18	Comments	2018 / 19	Comments
a	Annual Review		Process defined, numbers not robust		Process defined, numbers robust (second review)
b	PWPC by production site				Role out in NW complete. Role out in E & S sites not yet complete. Anticipate green by May 19.
c	Water resource zone PWPC				Once above numbers available, WRZ will also be green. Anticipate May 19.
2 Asset failure/unplanned outage	**Component**				
a	Source data		Only generic 'system failure' type records. Investigate to understand planned or unplanned and Ml/d impacts		Water balance reporting is routine and utilised to drive operational efficiency. This in addition to SCADA changes and MIPS reporting will make more robust.
3 Planned outage	**Component**				
a	Source data - programme of works		Planned activities are well documented, but their impact on outage is for production planning purposes, rather than this measure		Planned activities are well documented and impacts of outages are documented daily to understand planned/unplanned and the Ml/d impact on outage.
4 Duration	**Component**				
a	Start time		Daily data is used to calculate outage		Daily data still utilised fixed 24 hour periods. However, SCADA screen and MIPS system captures start and stop times to calculate duration. Will be complete May 19 (green)
b	End time				
c	Rounding				Currently record actual days, allows rounding. However improved by SCADA/MIPS to rolling 24hr assessment and rounding. May 19.
5 Reduction in capacity	**Component**				

a	Reduced capacity		Historical data poor, asset failure recorded rather than the impact or duration of outage		Site teams assessing asset failure for outage Ml/d and duration. Shortfall in Ml/d to be identified through SCADA/MIPS work one implemented (green May 2019).
b	Total outage		Sum of component parts		Sum of component parts
6 Exclusions	**Component**				
a	Normal Water quality operating band		Robust data but no process or operational bands defined outside abstraction management in ESW. Some raw water actively managed for NO3.		No WQ exclusions claimed. WQ team to identify process and normal bands and document in a procedure which robustly captures duration and Ml/d. To be implemented 2019.
b	Evidence of WQ events		Same as above		Same as above, evidence from procedural records.

NES.OC.A39

We have revised our performance commitments to align with the re-assessment of our 17/18 and 18/19 baseline position following further industry clarification on the revised sewer collapse definition. Our 18/19 improvement compared to 17/18 (~18%) is due to improved data recording/reporting, site survey work and understanding of the revised definition.

Our proposal represents the same % improvement, from a lower base position in 17/18.

This proposal continues to represent a significant and stretching reduction in collapses over the period. We feel this level of reduction is important given the adverse impact that the new reporting definition had on our numbers. While there is currently some uncertainty over where industry Uppre Quartile (UQ) lies (again due to the reporting changes) we believe that this level of improvement in our data, along with the proposed performance commitment (PC) levels for AMP7, will raise our chances of being well placed.

We will continue to work closely with the industry to improve the reporting and performance of this measure.

Sewer collapses is an important measure of Asset Health. In 2017 we conducted independent customer engagement to ascertain customer views on asset health. The findings from this engagement can be found in appendix 2.2 of our Business Plan.

In summary:

“Not a single customer participating in our 2017 research in resilience, asset health and long-term affordability felt it would be acceptable for us to take a ‘reactive’ approach to asset health. Instead participants expected us to maintain the condition of our assets and provide stable performance.”

We believe that our proposal exceeds customers’ expectations of stable performance.

Original business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
per 1,000 km	18.56	17.63	15.87	14.28	12.85	11.57	10.99	10.44
No of collapses	557	529	477	429	386	347	330	313

Proposed revised business plan submission

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
per 1,000 km	14.47	11.95	11.32	10.69	10.06	9.43	8.79	8.13
No of collapses	436	360	341	322	303	284	265	245

NES.OC.A40, NES.OC.A41, NES.OC.A47, NES.OC.A48, NES.OC.A55

This response addresses the points in the queries NES.OC.A40, NES.OC.A41, NES.OC.A47, NES.OC.A48 and NES.OC.A55 relating to Outcome Delivery Incentive (ODI) rates being coherent (i.e. no overlap) across our package of sewerage network Performance Commitments (PCs). Details of how our ODIs appropriately incentivise performance are covered in NES.OC.A2 and NES.OC.A5. The specific points relating to individual ODI rates for Collapses and External Flooding are addressed in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1, also in line with our response to queries NES.OC.A5 and A2.

We have a number of PCs/ODIs relating to our sewerage network. In our original business plan all were financially incentivised via penalty and reward, specifically:

- Pollution
- Internal Flooding
- External Flooding
- Repeat Flooding
- Blockages
- Collapses

The primary customer outcome measures in this suite of ODIs relate to Pollution and Flooding. Blockages are also problematic for customers, particularly when they occur on the local network, even if no pollution or flooding results.

Therefore, we have focused our response on ensuring that there is no overlap across the 3 flooding measures, or between collapses/blockages and the other measures.

In the past three years, less than 0.2% of incidents (from over 11,000 flooding incidents) have flooded internally, and have then subsequently flooded externally (and vice versa). We are therefore confident that our ODIs for internal and external flooding complement each other and do not overlap.

For repeat sewer flooding, our ODI incentive rate is based on customer engagement relating to the degree to which a repeat incident is worse than a first incident. Thus again ensuring no overlap.

Full details of the associated ODI calculation can be found in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

On average, we identify 16,000 blockages per year on our sewerage network. Out of our total number of blockages, approximately 14% result in internal or external flooding from our sewerage network. We are therefore proposing a 14% reduction to our proposed incentive rates for blockages, in order to remove any duplication. Note that our current incidences of category 1-3 pollution are very low. Even if all were caused by a blockage, only around 0.3% of blockages would be linked to pollution, making any overlap negligible.

For sewer collapses, we currently report approximately 350 sewer collapses per year as per the revised definition of sewer collapses reported for PR19. The revised definition refers to a reportable sewer collapse being considered to be where a failure has occurred to the pipe that

results in either any contact with the company (i.e. an impact on service has caused someone to contact the company) or any unplanned escape of wastewater, and results in the need to replace or repair the pipe to reinstate normal service.

We therefore agree that it is difficult for any sewerage company to identify where a sewer collapse has not resulted in an incident that will impact on one of the other performance commitments and therefore ODIs that we have proposed. We have therefore decided to remove any reward associated with sewer collapses, but will keep the proposed penalty associated with the performance commitment as this is an important incentive to maintain asset health. (This also specifically answers NES.OC.A40.)

Through a combination of our original proposal, and these further adjustments, we are confident that our proposed package of ODIs is coherent and are in the best in best interests of our customers.

NES.OC.A46

Our performance on this measure is currently better than Upper Quartile (UQ). Our original business plan submission proposed an improvement to 2.2 contacts per 10,000 population, in each of the 5 years, in order to keep us ahead of our projected UQ.

From the detailed feedback, we understand that the action arises from the fact that, when our Performance Commitment (PC) level expressed as a rate per 10,000 population, is combined with our forecast population increase, our PC level if expressed in absolute terms of number of contacts may actually increase slightly.

We have thus made a further adjustment to our PC level to offset this effect, and to avoid the above issue.

Year	2020	2021	2022	2023	2024	2030	2035
Original PC (normalised per 10,000 population)	2.2	2.2	2.2	2.2	2.2	2.11	1.88
Revised PC (normalized per 10,000 population)	2.08	2.07	2.05	2.04	2.02	1.88	1.63
Population forecasts (1000's)	4604.459	4638.973	4673.339	4706.697	4739.807	4891.345	5018.696
Contacts equivalent	957	957	957	957	957	919	819

This proposal is aimed at keeping us ahead of UQ. In our quarterly domestic tracking customer research, customers consistently score the Taste and Smell of our drinking water highly – at 9 out of 10. Thus a more stretching target is not warranted from a customer perspective.

NES.OC.A50B

Summary

Given that wholesale business is subject to revenue control, targeting voids results in the same amount of revenue being apportioned across a greater number of customers resulting in slightly lower average bills. Importantly it does not in itself increase the total revenue recovered by the company – making an operational delivery incentive (ODI) appropriate to incentivise improvement without creating any perverse incentives (for example duplicating the benefit).

Our Water Forums support this approach, as confirmed at an ODI review meeting in April 2018.

> *We do not understand the relevance of the specific point regarding perverse incentives regarding the timely and accurate registration of void sites. Failure to register voids in an accurate and timely way would inflate bad debt, which is not in the company's interests.*

We can see that **if** our performance commitment (PC) was calculated based on a snapshot of voids numbers at the end of the reporting year, then this might incentivise us to postpone any activity to reduce void numbers to the last possible moment in the reporting year in order that we would minimise any additional exposure to bad debt, whilst still receiving the full benefit of any ODI reward. **We have, however, defined our voids PC as the average over the reporting year, specifically to avoid this.**

Our voids PC is calculated based on average void numbers over the year (as opposed to a snapshot on 31st March), which mitigates the above concern.

Furthermore, all ODIs are reliant on accurate and timely recording of the aspect of performance being measured, so it is unclear why this point has only been raised for voids. Accurate and timely recording of data for all our PCs is covered by our assurance plan which will be updated in line with our proposed performance commitments for AMP7.

Calculation of Incentive Rates

To calculate incentive rates for voids we calculated the level of bill reduction associated with tackling voids which provided a direct indication of the customer benefit (marginal valuation).

To obtain the reward and penalty rates from the marginal valuation and costs we have utilised the formulas provided by Ofwat in Appendix 2 of the final methodology:

ODI penalty = Incremental WTP – (incremental cost x p)
ODI reward = Incremental WTP x (1–p)

The detailed calculations are provided at the end of this response.

Customer Support

Subsequent to receiving the Initial Assessment of Plans, we have conducted further engagement with customers to ascertain the extent to which they support this approach – which, based on the above equations amounts to 50% of the benefit of reducing voids paid as an ODI, with the other 50% being used to reduce average bills.

In our post IABP customer engagement, 90% of participants supported this approach.

A full write up of this independent engagement can be found at: 'NES.OC.A1-74 - Additional Evidence - IABP Additional Engagement Research Report'.

This provides further evidence that our proposed approach is supported by customers.

Marginal Valuation - Voids

Area	Current Voids	Void Target	Difference	Average Bill	Extra Value Associated with the reduction in voids using the average bills
Northumbrian Water	58826	54686	4140	390	£1,614,600
Essex Water	26751	20528	6223	245	£1,524,635
Suffolk Water	5063	5007	56	245	£13,720
NWL Total	90640	80221	10419		**£3,152,955**

Adding an extra 10,419 properties to bill paying: = NWL New Properties Bill Paying / Total NWL Properties Total NWL and ESW Water Household Properties Connected	1,917,878
Therefore the extra 10419 properties / Total HH connections	0.54%
Thereby a 1% increase in the number of properties	£5,803,804
To adjust by RPI and CPIH	£5,919,880

Marginal Costs

Costs associated with improving the void rate by 0.54% are	£320,000 over 5 years.
Thereby a 1% increase in the number of properties	£603,774
To adjust by RPI and CPIH	£615,849

Incentive Rates

Reward = Marginal Valuation * 0.5	£2,959,940
Penalty = Marginal Valuation - (Marginal Costs * 0.5)	£5,611,955

Marginal Valuation -Voids

Area	Current Voids	Void Target	Difference	Average Bill	Extra Value Associated with the reduction in voids using the average bills
Northumbrian Water	58826	54686	4140	390	£1,614,600
Essex Water	26751	20528	6223	245	£1,524,635
Suffolk Water	5063	5007	56	245	£13,720
NWL Total	90640	80221	10419		**£3,152,955**

Adding an extra 10,419 properties to bill paying:	
= NWL New Properties Bill Paying / Total NWL Properties	
Total NWL and ESW Water Household Properties Connected	1,917,878
Therefore the extra 10419 properties / Total HH connections	0.54%
Thereby a 1% increase in the number of properties	£5,803,804
To adjust by RPI and CPIH	£5,919,880

Marginal Costs

Costs associated with improving the void rate by 0.54% are	£320,000 over 5 years.
Thereby a 1% increase in the number of properties	£603,774
To adjust by RPI and CPIH	£615,849

Incentive Rates

Reward = Marginal Valuation * 0.5	£2,959,940
Penalty = Marginal Valuation - (Marginal Costs * 0.5)	£5,611,955

NES.OC.A52

Our business plan stated that for our new interruptions measure (looking at shorter duration interruptions between one and three hours) we would need to collect data over a three year period. This was to provide a 'baseline' performance level from which we would improve by 10% by 2024/25.

This measure will work in the same way as the common measure, following the same industry reporting methodology. We think this measure is needed to drive the industry forward and a measure of all interruptions >1 hour could be adopted as the new industry common measure in future.

As this is a new measure we do not have sufficient historical data for shorter interruptions from which to derive targets. We are therefore committing to a percentage reduction in performance by 2024/25, in line with Ofwat's guidance for new measures in the PR19 methodology. We will collect data from April 2018 to March 2021 and take a three-year average of performance as our baseline from which we will then aim to improve by 10% by 2024/25. We will follow this with a further 5% improvement by 2030 and by a further 5% by 2035.

We will began using this new measure in April 2018 and will report our performance for 2018/19 in our annual performance report. We have ensured that data for interruptions of one to three hours is as robust as data for interruptions of three hours or more by:

- Training all field teams who submit interruptions data to inform them of the new measure and ensure they understand the importance of accurate data capture;
- Using the same team to validate data for interruptions of one hour or more as we do for interruptions of three hours or more - using radial mapping techniques with customer data and flow and pressure data where available to verify the detail of interruption events;
- Ensuring our data is complete using regular cluster analysis of customer contacts. This involves checking where two or more customer 'no water calls' occur within one hour in the same district metered area – suggesting an interruption of one hour or longer has occurred. If we find evidence of an unreported interruption this will be investigated by analysts.

NES.OC.A54

We remain committed to our original Performance Commitment (PC) levels.

While we are very supportive of the principle of appropriately calculated Upper Quartile (UQ) targets for common PCs, we believe it is more important for bespoke PCs to reflect local circumstances and in particular the views of local customers – indeed that is their purpose.

Our original proposal already represents an extremely stretching 35% reduction in external flooding incidents from current levels.

This proposal formed part of our business plan acceptability research in 2018 which resulted in 91% customer acceptability.

We have subsequently conducted further customer engagement specifically relating to external flooding, full details can be found in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 2 – IABP Additional Customer Research.

The results show that a majority of 61% of customers not only support our proposed PC level, but supported the payment of a reward if we beat it. To quote one customer:

> "*This is very ambitious, if they achieve this, they deserve an award*"

Finally, we believe that our local circumstances in the North East, based on a combination of climate, topology and soil type (i.e. its permeability), make this PC an even greater challenge.

NES.OC.A59, NES.OC.A60, NES.OC.A60A, NES.OC.A61, NES.OC.A62, NES.OC.A62A, NES.OC.A63, NES.OC.A64, NES.OC.A65, NES.OC.A69, NES.OC.A70, NES.OC.A71

Customer protection

Unit rate

To protect our customers we will apply a penalty rate for underperformance against this enhancement. As this enhancement targets a number of specified units as an output, we have based our penalty on a per unit basis. We will incur a penalty to the value of the number of units we achieve below our Performance Commitment (PC). For example, a PC of 10 and an actual performance of 9 would incur a penalty of 1/10th the value of customer funding received.

Any penalty will be calculated as a net present value neutral adjustment as part of the PR24 true up process of the relevant 2019 Final Determination cash flows should the outcome be delivered partially or not at all. The discount rate used will be 3.3% real, the Consumer Price Index Housing (CPIH) stripped cost of capital.

Time rate

To protect our customers we will apply a penalty rate for underperformance against this enhancement. As this enhancement targets a specific output by a date in the future, we have based our penalty on a per day late of delivery basis. This uses the same principle as our PC for R-F1 Delivering a consolidated customer information and billing system, penalty rate 2 at PR14.

Any penalty will be calculated as a net present value neutral adjustment as part of the PR24 true up process of the relevant 2019 Final Determination cash flows should the outcome be delivered late, partially or not at all. The discount rate used will be 3.3% real, the CPIH stripped cost of capital.

All enhancement costs include a stretching 1% p.a. efficiency.

We will send a further update by 31 May that confirms the penalty rates described for each enhancement.

NES.OC.A59, A60, A60A Water resilience enhancement

The water resilience programme of work includes multiple schemes, some projects span several years and others are shorter and complete within a year. It is also important to note that some schemes have attracted Drinking Water Inspectorate (DWI) commendation and/or DWI support. These schemes attracting support will be converted into legally binding programmes of work (Undertakings).

The PC best suited to monitor the enhanced resilience outcome is an output based measure which tracks the % delivery of each scheme.

Progress with scheme construction (% complete) will be reported in our Annual Performance Report (APR). Penalty will be payable if construction overruns, does not occur, or the number of customers benefitting is not at 90% of the forecast level at 31 March 2025.

The application of penalty will apply to the construction end date determined from detailed design of each scheme. A preliminary example based on prefeasibility planning is shown below.

Scheme	Number of customers benefitting	Forecast completion date*	Customer protection
Too critical to fail	942,000	31/03/25	Time rate
Teesside	322,003	31/03/25	Time rate
Central	340,450	31/03/25	Time rate
Tyne	43,116	31/03/25	Time rate
Suffolk	89,373	31/03/25	Time rate
Essex	531,860	31/03/25	Time rate

* Penalty to be based on actual completion dates determined through detailed design, not the forecast dates above which are, in the majority of cases, based on prefeasibility information.

Completing this significant programme of work to time is extremely stretching.

NES.OC.A61, A62, A62A Lead enhancement

The Lead enhancement programme is only partially suited to having milestones for delivery of the programme throughout AMP7. Removing lead services and reducing customer exposure to lead is the priority. This activity is customer led, it is essential to retain flexibility to be able to actively respond to customer demand. This scheme has DWI support and therefore customer protection will exist in the form of legally binding Undertakings with DWI. Annual reports will be provided to DWI reporting progress.

Customer protection will take the form of unit rate penalty.

This programme of work includes delivering pipe replacement on the customer side (supply pipe) to completely remove lead from customer properties. This is a new approach and this adds risk and stretch to the lead enhancement scheme.

NES.OC.A63, A64, A65 Smart metering enhancement

Smart metering programme is only partially suited to having interim milestones as uptake is predominately optant led. Therefore we need to retain flexibility to respond to customer demand, rather than have fixed annual quotas. We will report progress annually in the APR.

Customer protection will take the form of unit rate penalty.

Our ambition is that by 2035 all meters will be smart and linked to a smart network. This is a stretching challenge.

NES.OC.A69, A70, A71 Cyber resilience enhancement

The Cyber resilience enhancement programme is critical to deter cyber attacks and comply with recommended practice as well as legislation (Network and Information Security (NIS) Directive). We are stimulated to protect our service to customers, our assets and our operational technology from threats. We do not feel having a published PC with routine reporting in the public domain for cyber security is appropriate. It could identify NWL as a greater target than we already are and create undesirable consequences.

The DWI fulfil the competent authority function for NIS Directive compliance and we will agree any additional reporting requirements with DWI in due course. Customer protection will take the form of a time rate penalty.

NES.OC.A66, NES.OC.A67, NES.OC.A68, NES.OC.A72, NES.OC.A73, NES.OC.A74

Customer protection

Unit Rate

To protect our customers we will apply a penalty rate for underperformance against this enhancement. As this enhancement targets a number of specified units as an output, we have based our penalty on a per unit basis. We will incur a penalty to the value of the number of units we achieve below our Performance Commitment (PC). For example, a PC of 10 and an actual performance of 9 would incur a penalty of 1/10th the value of customer funding received.

Any penalty will be calculated as a net present value neutral adjustment as part of the PR24 true up process of the relevant 2019 Final Determination cash flows should the outcome be delivered partially or not at all. The discount rate used will be 3.3% real, the Consumer Price Index Housing (CPIH) stripped cost of capital.

Time Rate

To protect our customers we will apply a penalty rate for underperformance against this enhancement. As this enhancement targets a specific output by a date in the future, we have based our penalty on a per day late of delivery basis. This uses the same principle as our PC for R-F1 Delivering a consolidated customer information and billing system, penalty rate 2 at PR14.

Any penalty will be calculated as a net present value neutral adjustment as part of the PR24 true up process of the relevant 2019 Final Determination cash flows should the outcome be delivered late, partially or not at all. The discount rate used will be 3.3% real, the CPIH stripped cost of capital.

We will send a further update by 31 May that confirms the penalty rates described for each enhancement.

NES.OC.A66 – A68: Delivery of Wastewater Resilience enhancement programme

Network resilience:

Enhancement element	Totex (£m)	Programme delivery	Customer protection methodology
Monitoring	4.303	Yearly milestones	Unit rate
Model enhancement	1.188	Yearly milestones	Unit rate
Strategic studies	1.782	31/03/25	Unit rate
Wastewater resilience schemes	3.168	31/03/25	Unit rate
DWMP	9.165	Draft publication 01/06/22 Final publication 01/03/23	Time rate

Too critical to fail:

Enhancement element	Totex (£m)	Programme delivery	ODI proposed
Flood mitigation	36.058	Yearly milestones	Unit rate
Temperature extreme mitigation	16.020	Yearly milestones	Unit rate
Fire mitigation	0.430	Yearly milestones	Unit rate
Pump lead time mitigation	1.00	Yearly milestones	Unit rate
Howdon STW expansion	14.730	Defined milestones – refer to business case	Unit rate

NES.OC.A72 – A74: Delivery of Wastewater Howdon STW enhancement programme

Enhancement element	Totex (£m)	Programme delivery	ODI proposed
Howdon STW expansion	14.730	Defined milestones – refer to business case	Unit rate

Completing this significant programme of work to time is extremely stretching. All enhancement costs include a stretching 1% p.a. efficiency.