

REP06 (redacted) Outcome Delivery Incentives

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1. Executive Summary

The Outcomes included within our June plan were developed in accordance with the outcomes delivery methodology proposed by Ofwat and then developed in conjunction with UKWIR. As such we included cost beneficial performance commitments, which directly reflected our customers' willingness to pay with research, and interpretations of that research, having been agreed following detailed consultation, with our Customer Challenge Group. This approach resulted in a suite of stretching performance commitments and an incentive regime, which was significantly more biased towards penalties than towards rewards.

The changes proposed within the Draft Determination, significantly shift the balance of risk and incentives, and result in a very asymmetric incentive regime. This is contrary to the risk and reward guidance set out by Ofwat in January 2014 which suggested an outcome delivery incentive (ODI) range of between $\pm 1.0\%$ to $\pm 2.0\%$ and a minimum ODI upside of more than 1.0%.

As shown in the central case scenario in Figure 1 below, U UW already needed to improve performance to avoid a net £51m penalty in the AMP6 period. The revisions proposed in the Draft Determination increased the central case scenario penalty by over £100m to £156m and would reduce the P90 rewards to less than £100m whilst increasing the P10 penalties to approximately £450m.

	P10 Scenario (BP/DD) £m	Central Case Scenario (BP/DD) £m	P90 Scenario (BP/DD) £m
Wastewater	-190 / -291	-23 / -95	97 / 26
Water	-193 / -164	-28 / -61	102 / 66
Wholesale	-383 / -455	-51 / -156	199 / 92
Difference between the June plan and the DD	-72	-105	-107

Figure 1 – June plan and Draft Determination outcome delivery incentive regime

The key elements of our representations are summarised below:

1.1 Upper quartile targets (see Annex A)

United Utilities supports the principle that *“outcome incentives need to ensure that companies are appropriately rewarded for outperformance, while at the same time avoiding situations where companies can gain financially for delivering a level of performance that is not stretching”*.

We however believe that this aspiration was much more effectively delivered through our June plan than through the revision proposed in the Draft Determination. This revision would effectively remove the opportunities to earn any net rewards for outperformance and the use of simplistic upper quartile targets has proposed arbitrary and often unachievable performance targets rather than targets which are both demonstrably stretching and are reflective of our customers' priorities.

We do, however, recognise that Ofwat are unlikely to radically move away from this approach for the Final Determination and therefore, for the purposes of seeking to agree a mutually acceptable determination, we will accept that upper quartile based targets should be adopted for the measures identified in the Draft Determination. We are however, proposing that the upper quartile targets and incentive regimes for two specific measures (sewer flooding and water quality contacts) are adjusted to reflect the specific circumstances faced by United Utilities – See Annexes B and C.

1.2 2% RORE cap on penalties and rewards

We welcome Ofwat's recognition that *“because of the newness of outcomes and limitations in the comparability across the incentives companies proposed there is some risk that customers and companies could be exposed to excessive rewards and penalties”*. We also consider that placing an aggregate cap on the scale of the exposure is an appropriate response to this uncertainty.

We believe that further clarity on the application of this cap should be provided in the Final Determination, with our interpretation of the way that this cap would operate being that:

- Rewards and penalties for each price control would be calculated separately.
- The cumulative impact of each would be determined, independently over the five years of the price control period.
- If the cumulative penalty or reward independently exceeds 2% of RORE then that incentive would be capped at 2%.

So for example if the value of the cumulative reward was 2.5% of RORE and the penalty was 1.5% of RORE, then the reward would be capped at 2%, no adjustment would be made to the penalty and as such a net reward of 0.5% of RORE would be derived.

In principle we accept that under a symmetric incentive regime, similar to that set out by Ofwat in the January risk and reward guidance, that a +/-2% variation would provide an appropriate level of exposure. However, the P90 penalty value generated by the Draft Determination would be nearly five times the size of the P10 rewards, with this imbalance needing to be addressed in the Final Determination.

1.3 Application of outcome delivery incentives at PR19

In our June Business Plan we proposed that outcome delivery incentives will be applied at the next price determination on the following basis:

- A cumulative net penalty or reward for all the financial measures within a single price control will be calculated for 2015/16-2018/19.
- If this shows that a net penalty is warranted then we would intend to apply this as a revenue adjustment to the relevant service in AMP7, so that the penalty is fully reflected in AMP7 price controls.
- If, on the other hand, a net reward is warranted then we would intend that this would be applied as an adjustment to the service level RCV in AMP7, such that the reward is recovered over a longer period of time.
- Net penalties or rewards relating to performance in 2019/20 will be applied in the same way in AMP8, with penalties applied to service revenue controls and rewards applied to service RCV.
- Application of penalties and rewards on this basis will be dependent upon the company having the facility and scope to adjust overall PAYG and RCV run off rates in order to manage customer bill impacts and maintain financeability. In the event that this was not possible, then all penalties and rewards relating to AMP6 will be applied to the service level RCV at the beginning of AMP7 (for rewards and penalties arising from 2015/16 – 2018/19 performance) and AMP8 (for rewards and penalties arising from 2019/2020 performance.)

The Draft Determination specified that the assessment period should be 2015-16 to 2019-20, with an estimate being made for performance in 2019-20 as part of the PR19 process. Any difference from this estimate would be dealt with through an adjustment applied at AMP8. No specific reference was made to the application of penalties and rewards, being subject to the company having the scope to adjust PAYG and RCV run off rates.

We accept the proposed revision to the assessment period, but propose that if the ability to adjust overall PAYG and run off rates is removed, or constrained, then we would retain the option of applying net penalties or rewards to the service level RCV.

1.4 Outcome Delivery Measurement and Reporting

We set out our proposed approach to outcome delivery measurement and reporting in our June submission (document RD006). In the Draft Determination, Ofwat stated that they were satisfied with these proposals although it was stated that, in line with the technical appendix A9 – assurance, monitoring and reporting obligations, Ofwat would consider the categorisation of the company for assurance purposes at the Final Determination.

1.5 Water Service Outcomes (See Annex B)

Seven of the measures proposed in our Business Plan were not adjusted in the Draft Determination. We are not proposing to revise these measures in this representation and assume they will be retained in their existing form in the Final Determination. The measure associated with the Thirlmere link scheme was removed and adjustments were proposed to four other measures. Our proposals with respect to these measures are detailed in Annex B and summarised below:

A2 Water quality events DWI category 3 or above - As a result of the bottom up analysis, the reward associated with this measure was removed. We are not challenging this revision in this representation.

A3 Water Quality Service Index – Two sub measures in this index have been amended to target upper quartile performance. These revisions would result in penalties being incurred even in the P90 “best case” scenario we are proposing that changes are made to both of these measures for the Final Determination.

- We demonstrate that our performance on Water Quality Contacts is directly affected by two main factors which are outside of management control and that when these factors are taken into account the performance commitment in our Business Plan is ahead of upper quartile performance.
- Mean Zonal Compliance: We are not challenging the application of penalties for this measure if performance is lower than 99.96%, we are however, proposing a revision to the upper quartile target used in the index and proposing a penalty rate for this sub-measure.

B1 Average minutes lost per property - As a consequence of the horizontal audit the performance commitment was made more stretching and the cap and collars were adjusted. We are not challenging the upper quartile target in these representations. We are however, proposing that the glide path for delivering this target is extended to the end of the AMP (from 2017/18) to reflect the implementation of resilience work which will be required to comply with this target.

B2 Reliable Water Service Index - As a result of the bottom up analysis the mains burst sub-measure was removed from the reward calculation. We had proposed this revision following our June resubmission and therefore, accept the proposed change.

B6 Thirlmere transfer to West Cumbria - As a result of the bottom up analysis, this outcome was removed in the Draft Determination. We have proposed how a revenue allowance for the expenditure associated with this work can be made in our representations on the Water Totex programme (reference document REP05) and are proposing that this measure is reinstated in the Final Determination.

1.6 Wastewater Outcomes (See Annex C)

Four of our proposed measures had no adjustments proposed in the Draft Determination. We are not proposing to revise these measures in this representation and assume they will be retained in their existing form in the Final Determination. Adjustments were however, proposed or further justification requested for eight measures. Our proposals with respect to these measures are detailed in Annex C and summarised below:

A1 Private Sewers service index- As a result of the bottom up analysis, the performance commitment was made more stretching and the dead bands, cap and collar were adjusted. We are not challenging this revision in this representation.

B2 Sewer flooding index - As a consequence of the horizontal audit the performance commitment was made more stretching and the cap and collars were adjusted. We are proposing that the performance commitment and incentive regime from our Business Plan are reinstated.

- We demonstrate that our performance on this measure is directly affected by a number of factors that are outside of management control and that when these factors are taken into account the performance commitment proposed in our Business Plan is ahead of upper quartile performance.
- We also demonstrate that although the dead bands proposed in the Draft Determination appear to be symmetrical, they would inadvertently, create very asymmetric risk levels.

D1 Protecting rivers from deterioration due to population growth - As a result of the bottom up analysis, the reward associated with this measure was removed. We are not challenging this revision in this representation. We are also proposing to increase the penalty associated with the major integrated scheme at Davyhulme WwTW, to ensure that customers would be effectively protected from any reduction in the level of assumed growth in the catchment.

D2 Maintaining our wastewater treatment works - As a result of the bottom up analysis, the penalty dead band was adjusted. We are not challenging the revision to the dead band in this representation, but we are proposing revisions to the way that the measure is calculated and applied, which will more effectively protect customers from under delivery resulting from the failure of our largest WwTW and ensure that the penalty is more proportional to the potential environmental impact of the failure.

D3 Contribution to rivers improved (wastewater programme) - No interventions were made to this measure, although more evidence was required to support the proposed penalty rate. We have provided additional evidence to demonstrate that our incentive regime fully protects customers. We have also revised the performance commitment and incentive regime to reflect the removal of the “AMP7 early start programme” from our plan.

D4 Wastewater Pollution Index – We had proposed a reward mechanism for this measure following the June Business Plan submission, which was not reflected in the Draft Determination. As a result of the bottom up analysis, the penalty collar was increased. It was also stated that a reward mechanism would be considered for Final Determination, if rewards were not earned for category 1 and 2 events and further explanation is provided to demonstrate that the reward would be stretching. We are proposing that this measure is split into two separate measures. A penalty only measure associated with category 1 and 2 incidents and a penalty and reward measure associated with category 3 incidents.

1.7 Retail Outcomes (See Annex D)

None of our proposed measures were adjusted in the Draft Determination.

Potential new ODI – IT enhancement programme - more evidence was required to demonstrate that customers would be protected in the event of non delivery of this programme of work. We have provided evidence to show that customers would be protected. We have also however, developed an additional outcome delivery incentive that could be utilised in the Final Determination if Ofwat believe that further protection would be beneficial.

The Draft Determination also proposed that customer contacts for water quality would be reflected in a common industry wide ODI. As described in Annex B, we believe that this measure disadvantages “northern companies” and would also result in double counting with the impact on SIM. To compensate for this impact we considered proposing that water quality contacts should be removed from the calculation of the quantitative SIM score. However, on balance we concluded that as SIM is now a well-established measure and the impact of removing this sub-measure would be comparatively minor, we will not be requesting any revision to SIM.

1.8 Conclusions

The impact that the changes we are proposing in our representations would have on the AMP6 Outcome Delivery Incentive regime is set out in Figure 2 below.

	P10 Scenario (DD/FD) £m	Central Case Scenario (DD/FD) £m	P90 Scenario (DD/FD) £m
Wastewater	-291 / -247	-95 / -48	26 / 63
Water (exc Thirlmere)	-164 / -162	-61 / -53	66 / 82
Thirlmere	0 / -34	0 / -5	0 / 19
Wholesale	-455 / -443	-156 / -106	92 / 164
Difference between DD & proposed FD	12	50	72

Figure 2 - DD and proposed FD representations outcome delivery incentive regime

Figure 3 below converts the incentive values in figures 1 and 2 above to RORE ranges (on the basis that £375m is equivalent to 2% RORE) and demonstrates that; our June business plan was already at the extremes of the risk and reward guidance; the Draft Determination would provide potential rewards which are less than half of the minimum guidance value; with our representations still falling short of the recommendations set out in the risk and reward guidance.

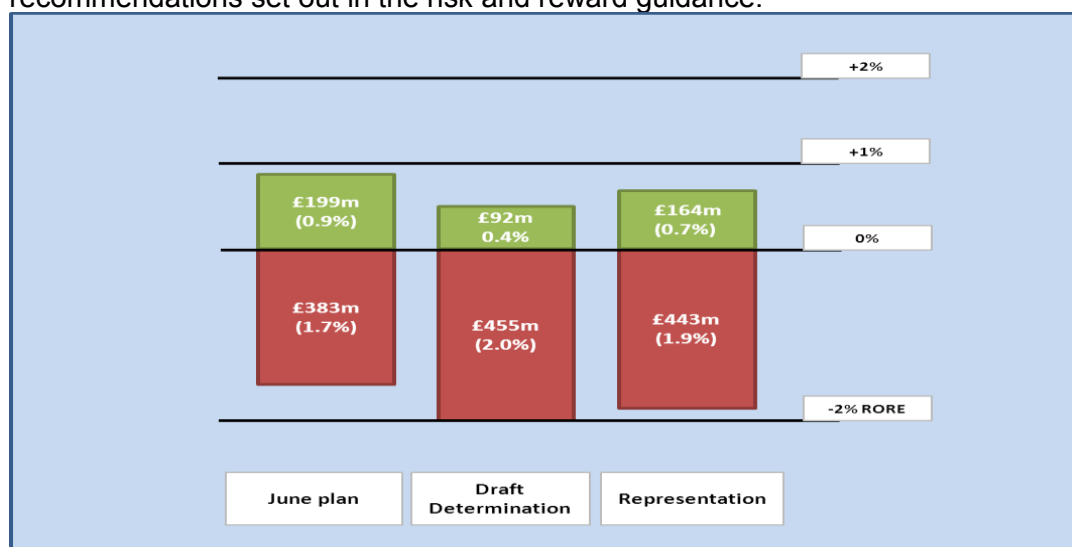


Figure 3 - ODI Risk and reward impacts

The extent of the performance challenge that is presented by this position is demonstrated by; the variance between the P10 penalties and P90 rewards and the level of penalty that would be incurred in the central case scenario.

The P10 penalties remain in excess of £400m even following our representations, which is more than two and a half times higher than the P90 rewards, and implies that the chance of hitting the 2% RORE penalty cap would be in excess of 10%, without further improvement in performance.

The central case scenario extrapolates our historic performance and demonstrates that if performance continued to be in line with our previous experience, then we would incur a penalty of over £100m. This position is approximately mid-way between the £156m implied in the Draft Determination and the £51m in our Business Plan.

We therefore believe that the resultant performance commitments and incentives demonstrably avoid any situations where United Utilities could gain financially for delivering a level of performance that is not stretching and retains some but very limited opportunities to be rewarded for outperformance.

2. Annex A upper quartile targets

1.9 Ofwat's Draft Determination

In Table 1 "Key areas of intervention within price controls" of the PR14 price control determination notice, Ofwat set out that *"for a small number of outcomes and performance commitments/ODIs Ofwat compared proposals across the sector and revised performance commitments and incentives to target upper quartile performance"*.

This intervention was made because *"one of the key principles for outcome incentives is the need to ensure that companies are appropriately rewarded for outperformance, while at the same time avoiding situations where companies can gain financially for delivering a level of performance that is not stretching"*.

As part of their horizontal audit of company business plans, Ofwat found that *"company proposed financial incentives were not always matched by performance commitments consistent with upper quartile performance. Company wholesale water and wastewater expenditure incentives are calibrated to achieve upper quartile efficiency during 2015-20. This means we would expect companies to deliver upper quartile performance on service delivery where this can be identified, to ensure customers' interests are protected"*.

1.10 Our response to the Draft Determination

- We fully acknowledge that *"one of the key principles for outcome incentives is the need to ensure that companies are appropriately rewarded for outperformance, while at the same time avoiding situations where companies can gain financially for delivering a level of performance that is not stretching"*
- We do not accept that because company wholesale expenditure incentives are calibrated to achieve upper quartile efficiency that customers' interests would be protected by applying upper quartile performance incentives.

We firmly believe that the outcomes delivery methodology as proposed by Ofwat and then developed in conjunction with UKWIR was designed to achieve the objective of developing stretching, cost beneficial and company specific incentives, and if applied correctly would successfully meet the key principle set out by Ofwat.

The performance commitments and incentives regimes which we included in our Business Plan were developed to be fully in accordance with the agreed outcome development methodology. We also worked with our Customer Challenge Group to develop a suite of cost beneficial performance commitments. Rewards were limited to areas with direct customer support and incentive rates were based upon the customer willingness to pay, adjusted for the impacts of the costs of any interventions through the totex incentive regimes.

We still remain of the view that the our proposed performance commitments and outcome delivery incentives fully met all aspects of the key principle set out by Ofwat and actively and appropriately balanced the totex and outcome delivery incentive regimes. By contrast the adoption of common upper quartile targets wholly fails to recognise the inherent differences which different companies will face in delivering common levels of service. The targets particularly fail to recognise the costs and timescales involved in implementing the programmes of work which would be necessary to make the step change in performance that in many cases would be required.

We therefore, consider that the revisions proposed in the Draft Determination would undermine the balance in our, and many other companies' plans, and could inadvertently incentivise companies to undertake non cost beneficial activities to avoid financial and reputational penalties.

1.11 Expectations for the Final Determination

We recognise that Ofwat are unlikely to radically move away from the approach of setting upper quartile targets that they developed and used in the Draft Determination.

Although we are of the view that performance commitments should be based upon detailed cost and benefit analysis, and any improvement in performance should be tested with and supported by our customers, we do not expect Ofwat to simply reinstate our June Business Plan targets in the Final Determination.

Therefore, for the purposes of seeking to agree a mutually acceptable determination, we will accept that upper quartile based targets should be adopted in the Final Determination. We do, however, propose that two specific measures, sewer flooding and water quality contacts, are adjusted to reflect the specific circumstances faced by United Utilities and that the timing of the achievement of the upper quartile target for supply interruptions is revised to reflect the implementation of necessary resilience work on the network.

The detailed rationale for these revisions and the proposed revisions to the performance commitments and incentive regimes are set out in Annex B and C below.

We also believe that it would be beneficial to confirm in the Final Determination whether companies will be exposed to penalties in the first two years of the AMP6 period.

3. Annex B Water Outcomes

This annex provides further detail in response to the interventions made by Ofwat to Water Wholesale’s Measures of Success as summarised in Draft Determination ‘Annex 4 Outcomes, performance commitments and outcome delivery incentives’.

Specific representations are provided with regard to the following measures:

A2 – Water quality events DWI category 3 or above.

A3 – Water Quality Service Index.

B1 – Average minutes lost per property.

B2 – Reliable Water Service Index.

B6 – Thirlmere Transfer into West Cumbria.

The sections below clarify whether we will accept these changes, or provide further information to justify an alternative performance commitment or incentive regime.

1.12 A2 – Water quality events DWI category 3 or above

1.12.1 Interventions made in the Draft Determination

A2 – Water quality events DWI category 3 or above	
What Ofwat did	We removed the reward.
Why Ofwat did it	We have removed the proposed reward because: 1. it is not for upper quartile performance; 2. the company has not sufficiently justified why a reward is appropriate for significant, serious and major drinking water quality events; and 3. without the reward the penalty should be sufficient to drive an improved performance.

Figure 4 - Extract from Ofwat DD Annex 4 Table AA4.2

1.12.2 Our response - Incentive Regime

We are not challenging the proposed changes to the incentive regime for this measure in this representation i.e. the removal of a reward incentive and associated deadband and cap as summarised in Figure 5 below.

1.12.3 Expectations for the Final Determination

We are not expecting any changes to be made for the Final Determination. We have reproduced (below) the Ofwat Annex 4 ‘Outcomes, performance commitments and outcome delivery incentives’ template for the Water quality events DWI category 3 or above. We have replicated the Draft Determination template with any changes to our June plan performance targets shown using strikethrough.

Incentive type: Financial – reward and penalty. Financial – penalty only

Performance commitments

	Unit	Starting level	Committed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	Nr / year	13	12	11	10	9	7

	Unit	Starting level	Committed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Penalty collar	Nr / year		15	15	15	15	15
Penalty deadband	Nr / year		12	11	10	9	7
Reward deadband	Nr / year		12	11	10	9	7
Reward cap	Nr / year		0	0	0	0	0

Figure 5 - Extract from Ofwat DD Annex 4 Pages 96 & 97 - Performance Commitments

Incentive rates

Incentive type	Performance levels (Nr / year)		Incentive rate (£m/Nr/year/year)
	Lower	Upper	
Penalty	15	7	0.149
Reward	12	0	0.017

Figure 6 - Extract from Ofwat DD Annex 4 Pages 96 & 97 - Incentive Rates

1.12.4 Impact on P90, P50 and P10 Analysis

The impact of the proposed change is:

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact	P90	Maximum reward
Our June Submission	-3.9	-3.9	-2.2	0.1	0.8
Ofwat DD	-3.9	-3.9	-2.2	0	0
Our acceptance of DD proposal	-3.9	-3.9	-2.2	0	0

Figure 7 - ODI impact Summary

1.13 A3 – Water Quality Service Index

1.13.1 Interventions made in the Draft Determination

A3 – Water Quality Service Index	
What Ofwat did	<p>We increased the PC from 121.7 to 129.0 in 2019-20 with similar adjustments to intervening years (see annex for details).</p> <p>We adjusted the cap and collar so that the ratio between them and the PC is the same as in the company’s original proposal.</p> <p>We applied a condition that United Utilities should incur a penalty if mean zonal compliance is below 99.96% in 2017-18, 2018-19 or 2019-20 regardless of the overall level of the index.</p>
Why Ofwat did it	<p>The water quality service index has six sub-measures and includes mean zonal compliance and water quality contacts. We carried out a horizontal comparison of mean zonal compliance and water quality contacts across the industry.</p> <p>The mean zonal compliance comparison revealed that United Utilities needed to have a more stretching performance commitment level for 2017-18, 2018-19 and 2019-20. We applied these new performance commitment levels to the company’s Water Quality Service Index.</p> <p>The water quality contacts horizontal comparison revealed that United Utilities needed to have a more stretching performance commitment level across the next price control period, 2015-20. We applied these new performance commitment levels to the company’s Water Quality Service Index.</p> <p>The combined effect of the two adjustments is to increase the performance commitment level from 121.7 to 129.0 in 2019-20 with similar adjustments to intervening years (see annex 4 for details).</p> <p>For consistency with the approach taken to other companies on mean zonal compliance we also required United Utilities to incur a penalty if mean zonal compliance is below 99.96% in 2017-18, 2018-19 or 2019-20 regardless of the overall level of the index. This penalty represents an incentive to the company not to reduce its compliance with water quality measures. This threshold represents the point at which financial incentives will be applied to the company through the price setting process. All companies are subject to drinking water quality obligations regulated by the DWI, which are the overriding statutory obligations that a water company must comply with as part of their Section 37 obligations. The company’s Board has confirmed as part of its business plan submission that it will comply with all relevant statutory obligations.</p>

Figure 8 - Extract from Ofwat DD Annex 4 Table AA4.2

1.13.2 Our response

United Utilities does not consider that it is appropriate to set an industry standard upper quartile target for water quality contacts.

We believe that each individual company's performance on this measure will be materially impacted by factors which are outside of effective management control. Several inherent differences exist between United Utilities and many of the other water companies which will impact water quality performance. Most notable of which is the inherent difference in discolouration risk presented by surface sources versus groundwater sources.

The soft upland water sources predominantly used by United Utilities have a higher intrinsic lead (corrosion) and taste/odour risk (from algal by-products) than equivalent hard water sources. This position is reflected in the higher discolouration contact rates of companies which predominantly rely upon surface water sources, when compared to other companies with predominantly hard groundwater sources.

This principle is supported by the DWI Chief Inspector's Report published on 10th July 2014 - ref 'Drinking water 2013, Public water supplies in the northern region of England, Maintaining water quality in distribution, page 60, discolouration contacts "...overall the northern region accounts for the highest proportion of the industry total (35%)'. Historical performance confirms this and expert judgement suggests the reason for this could be because northern companies with soft, upland source waters have a greater risk of manganese, iron and lead compliance failures and discolouration contacts than southern companies with predominantly hard groundwater sources". Data from the DWI Chief Inspector's reports over the last three years (2011-2013) shows the northern region as having greatest combined risk of compliance failure for lead, iron and manganese.

We also believe that whilst the number of customer contacts is an important customer measure, it is not a very effective absolute measure of water quality for use in intercompany benchmarking. Our experience has shown that our customers generally appreciate the relative aesthetic quality of our predominantly soft water supply. However, due to the integrated nature of our regional water supply, we do occasionally switch customer's water supplies from one source to another.. This change in source and the associated variation in the nature of the water supply may result in customer contacts. These contacts are not driven by an issue with the inherent quality of the water, but rather simply reflects a change in relative aesthetic qualities. We therefore believe that customers of smaller water only companies, or companies with less integrated networks, who will be less prone to changes in water supply, are less likely to contact their water company, even if the inherent aesthetic quality of their water supply is relatively poor.

We therefore propose that United Utilities' customer contact benchmarking should be made against WaSC only performance and not against all water companies. If this approach was adopted the equivalent upper quartile value for FY20 would be 10,762 which is less onerous than our Business Plan proposal of 9,100 and demonstrates the level of challenge which we had already set ourselves.

If these factors are not accommodated, and the proposed revisions and the performance commitment is left unchanged from the Draft Determination, then our analysis shows that we would expect to incur a penalty even under the P90 "best case" scenario (see Figure 14 below). As can also be seen from the central scenario in Figure 14, our revised proposals are clearly "stretching" and will still require us to significantly improve performance in AMP6 to avoid a penalty.

We propose an alternative incentive regime for this measure based on the supporting evidence provided below:

A3 – Water Quality Service Index	
What we propose	<p>1) We propose that an upper quartile performance target for MZC of 99.97% is used for years 2017-18 to 2019-20, when developing the Water Quality Service Index target</p> <p>2) We propose that the Index PC target for 2015-16 increases to 108.364 from 100.000. This is a slightly better position than our 2014-15 LBE performance of 107.199, reflecting the increase in MZC to 99.96%, but that the PC level for FY20 remains at our Business Plan target of 121.680. This target equates to 9,100 customer contacts for water quality (1.31/1000 customers), with all the WQ regulatory sub-measures achieving their target. See ‘Performance commitments at WQSI sub-measure level’ figure 12 below for further details.</p> <p>3) We propose that the caps and collars are adjusted using an additive rather than multiplicative approach.</p> <p>4) We are not challenging Ofwat’s proposed intervention to apply a penalty for mean zonal compliance (MZC) for the three years 2017-18, 2018-19 and 2019-20.</p>
Why we propose it	<p>1) The upper quartile MZC performance for all companies, based on the average of the last 3 years performance, is 99.97%¹. We propose this as an alternative upper quartile PC level for 2017-18, 2018-19 and 2019-20. This is consistent with the upper quartile approach taken by Ofwat for customer contacts and effectively moves our proposed improvement in MZC performance in 2019-20 forward into 2017-18. This is supported by customers and stakeholders who told us they are satisfied with drinking water quality and do not want to pay more for improvements.</p> <p>2) Ofwat has derived an upper quartile performance for water quality contacts using Drinking Water Inspectorate data on all ‘customer contacts’ (which includes illness, which is not categorised as ‘acceptability’ of water to customers)². Ofwat has also used both WaSC and WoC performance in their upper quartile calculations.</p> <p>Using the DWI ‘customer contact’ data and a 3 year average gives an upper quartile performance for WaSCs of 1.71 which for United Utilities would equate to 11,873 customer contacts in FY20. However, the definition of customer contacts for water quality in our WQSI includes appearance categories of brown/black/orange and blue/green, plus all categories of taste & odour. The upper quartile for WaSC performance for our customer contact sub-measure definition, based on a like-for-like informal Water UK data share information, is 1.55/1000, which equates to 10,762 contacts (Thames & Southern Water data was not available, so we have used the DWI all ‘customer contact’ data as a surrogate). Our proposed customer contact target for FY20 at 9,100 contacts is significantly lower than this.</p> <p>The United Utilities population figure used by Ofwat in their horizontal comparison of customer contact performance is 7,117,677 – the forecast population for 2015-2016. This differs from the ‘population supplied’ figure used by the DWI of 6,943,000 in their ‘water supply arrangements’ annual summary for each company (from which the customer contact comparison was taken by Ofwat). We do not consider it appropriate for Ofwat to combine back cast customer contact information and forecast population information. Therefore, to be consistent with the DWI</p>

¹ Based on Ofwat horizontal analysis as provided by Mathew Stalker 12 September 2014

² Based on Ofwat horizontal analysis as provided by Mathew Stalker 12 September 2014

'water supply arrangements' annual summary, we have used the DWI 'population supplied' figure of 6,943,000 for our calculations in this representation. The population rate used impacts the number of contacts per thousand population supplied.

We also propose that a 2015-16 WQSI PC of 108.364 is used, with this value being based upon our FY14 actual performance, which includes our best year's performance for MZC and a significant improvement in customer contacts, together with our LBE for FY15. We previously set our reward deadband at our best ever performance level, so that we only earned a reward if we at least matched our best ever performance.

We propose an increased target for the years 2016-17, 2017-18 and 2018-19 in line with our increased starting level and original improvement profile to reach the same end target of 121.680 (9,100 customer contacts) We believe this level of customer contacts would be consistent with upper quartile performance in FY20.

We are unable to meet the upper quartile stretch target proposed by Ofwat in year 3, as our Oswestry WTW manganese removal project³ delivers a third of the customer contact reduction proposed in our Business Plan. This project has a DWI 'project in use' date of 31.12.17, due to the size and complexity of the project. In addition, the benefits of any treatment change to give an improvement for discolouration can take up to 6 months to be realised.

3) We propose that the caps and collars are adjusted using an additive rather than multiplicative approach. Ofwat's use of the same ratio as used in our original proposal sets the reward cap and penalty collar at a broader range (5 index units) than our 4.72 units. We have used this approach to derive the cap and collar shown in 'Performance commitments at WQSI level' table 6 below

4) We propose that a MZC penalty rate of £0.770m is applied, which recognises the significance United Utilities puts on this measure. This incentive rate will apply for each 0.01% below a MZC performance of 99.96%, even if the overall index score is at the reward level. A penalty collar should be set for MZC at 99.94% as summarised in Figure 12 below.

Our proposed approach to incorporate a separate penalty regime for Mean Zonal Compliance within the Water Quality Service Index is summarised in Figures 12 and 15 below.

Figure 9 - Summary of our WQSI response

1.13.3 Expectations for the Final Determination

We have provided (below) a variation to the Ofwat Annex 4 'Outcomes, performance commitments and outcome delivery incentives' template for the Water Quality Service Index. We have amended the Draft Determination template to ~~strike through~~ any proposed changes from the Draft Determination and to show our revised proposals on an additional highlighted row.

³ DWI Undertaking reference UUT 3247
Document ref: REP06 (redacted) Outcome Delivery Incentives

Incentive type: Financial – reward and penalty.

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC – June submission	Index	100.00	101.973	103.946	106.570	113.538	121.680
PC - Ofwat DD	Index	100.00	106.0	115.4	129.0	129.0	129.0
PC - our revised proposal	Index	107.199	108.364	109.648	112.541	117.110	121.680
Penalty collar – June	Index		97.253	99.226	101.850	108.818	116.960
Penalty collar - Ofwat DD	Index		101.100	110.100	123.300	123.600	124.000
Penalty collar- our revised proposal	Index		103.644	104.928	107.821	112.390	116.960
Penalty deadband – June	Index		101.973	103.946	106.570	113.538	121.680
Penalty deadband - DD	Index		106.000	115.400	129.000	129.000	129.000
Penalty deadband - our revised proposal	Index		108.364	109.648	112.541	117.110	121.680
Reward deadband – June	Index		106.750	106.750	106.750	113.538	121.680
Reward deadband - DD	Index		106.000	115.400	129.000	129.000	129.000
Reward deadband - our revised proposal	Index		108.364	109.648	112.541	117.110	121.680
Reward cap – June	Index		106.750	108.666	111.290	118.258	126.400
Reward cap - DD	Index		111.000	120.600	134.700	134.400	134.000
Reward cap - our revised proposal	Index		113.084	114.368	117.261	121.830	126.400

Figure 10 - Extract from Ofwat DD Annex 4 Pages 98 & 99 - Performance Commitments

Water Quality Service Index Incentive rates

Incentive type	Performance levels (Index)		Incentive rate (£m/Index unit/year)
	Lower	Upper	
Penalty 1	97.253	100.000	2.102
Penalty 2 - our June submission	100.000	121.680	0.770
Penalty 2- Ofwat DD	101.700	129.000	0.770
Penalty 2- our revised proposal	103.644	121.680	0.770
Reward - our June submission	106.750	126.400	0.417
Reward - Ofwat DD	106.000	134.700	0.417
Reward - our revised proposal	108.364	126.400	0.417

Figure 11 - Extract from Ofwat DD Annex 4 Pages 98 & 99 - Incentive Type

Mean Zonal Compliance Incentive rates

	Performance levels (Index)		Incentive rate (£m/0.01%/year)
	Lower	Upper	
Penalty - our revised proposal	99.94 ⁴	99.96 ⁵	0.770
Reward - our revised proposal	No reward See Table 10	No reward See Table 10	No reward See Table 10

Figure 12 - Proposed incentive regime for MZC

⁴ Denotes Mean Zonal Compliance Penalty Collar

⁵ Denotes Mean Zonal Compliance Penalty Deadband

Our proposed performance commitments at WQSI sub-measure level

Sub-measure	Unit	Starting level	Proposed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
WTW Coliform non-compliance	%	0.04	0.04	0.04	0.04	0.04	0.04
SR integrity index	%	99.96	99.96	99.96	99.96	99.96	99.96
WTW turbidity fails	No	3	3	3	3	3	3
Mean zonal compliance	%	99.95	99.96	99.96	100.00 99.97	100.00 99.97	100.00 ⁶ 99.97
Distribution maintenance index	%	99.88	99.88	99.88	99.88	99.88	99.88
Unwanted customer contacts for water quality	No	10,387	10,444 10,387	9,616 10,251	8,787 10,068	8,787 9,584	8,787 ⁷ 9,100

Figure 13 - Summary of proposed performance levels for WQSI sub-measures

1.13.4 Impact on P90, P50 and P10 Analysis and proposed MZC incentive mechanism

The impact of the proposed ODI change is:

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact	P90	Maximum reward
Our June Submission	-22.9	-22.9	-5.8	6.6	6.6
Ofwat DD	-20.2	-20.2	-17.2	-9.7	11.0
Our revised proposal	-18.2	-18.2	-10.3	5.7	9.9

Figure 14 - ODI impact Summary

⁶ Struck through values denote Ofwat's proposed target profile for Mean Zonal Compliance as provided by Mathew Stalker on 15 September 2014

⁷ Struck through values denote Ofwat's proposed target profile for Unwanted customer contacts as provided by Mathew Stalker on 15 September 2014

		Overall WQSI Performance	Customer Contact Performance	Mean Zonal Compliance Performance	Other WQ sub-measures performance
No Reward or Penalty		At target	At target	At target	At target
		At target	No constraints	At or above MZC deadband	No constraints
		Above target	At or below target	At or above target	At or above target
Reward		Above target ¹	Above target	At or above MZC deadband	At or above target
Penalty	MZC penalty rate only ²	At or above target	No constraints	Below MZC deadband	No constraints
	WQSI penalty rate	Below target	No constraints	At or above MZC deadband	No constraints
	WQSI penalty rate only	Below target	No constraints	Below MZC deadband	No constraints

Figure 15 - MZC Sub-measure incentive mechanism

Note 1: The overall index value applied to calculate reward excludes any performance benefits derived from all WQ sub-measures, as previously agreed in principle in 'United Utilities Water PLC response to 'Outcome, PC and ODI issues' spreadsheet'

Note 2: Mean Zonal Compliance penalty regime applies for years 2017-18, 2018-19, and 2019-20 only.

1.14 B1 – Average minutes lost per property

1.14.1 Interventions made in the Draft Determination

B1 – Average minutes lost per property	
What Ofwat did	<p>We reduced the PC to 10 minutes from 2017-18 with a glide path from current performance (see annex 4 for details).</p> <p>We reduced the penalty deadband to 10 minutes from 2017-18.</p> <p>We made consequent changes to the penalty collar (see below for details).</p>
Why Ofwat did it	<p>We carried out a horizontal comparison of interruptions to supply across the industry. Consistent with our approach to other companies we reduced the performance commitment level and penalty deadband to 10 minutes (upper quartile) in 2017-18. We reduced the penalty collar to approximately maintain the company’s proposed maximum penalty.</p>

Figure 16 - Extract from Ofwat DD Annex 4 Table AA4.2

1.14.2 Our response - Incentive Regime

We propose an alternative incentive regime for this measure based on the supporting evidence provided below.

B1 – Average minutes lost per property	
What we propose	<p>We recommend that the Average Minutes Lost target is reduced down in stages to 10 minutes over the final 3 years of the AMP6 period.</p>
Why we propose it	<p>The target of 10 minutes is the same as the company long-term target. However, an intervention strategy has been included in our proposals to reduce the risk of failure of the highest risk assets, which is largely made up of interventions to trunk mains and LDTMs. As such any improvement will require a large proportion of this investment to be complete and commissioned before the improvement is realised.</p> <p>We propose an increased target for the years 2017-18 and 2018-19 in line with our increased starting level and original improvement profile to reach the same end target of 10 minutes, but by 2019/20</p>

Figure 17 - Summary of our Average minutes lost per property response

1.14.3 Expectations for the Final Determination

We have provided (below) the Ofwat Annex 4 ‘Outcomes, performance commitments and outcome delivery incentives’ template for the Average minutes lost per property measure. We have amended the Draft Determination template to ~~strike through~~ any proposed changes from the Draft Determination and to show our revised proposals on an additional highlighted row.

Incentive type: Financial – reward and penalty.

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC – our June submission	Ave min lost/prop/yr.	18.000	18.000	18.000	18.000	18.000	18.000
PC - Ofwat DD	Ave min lost/prop/yr.	18.000	15.300	12.700	10.000	10.000	10.000
PC - our revised proposal	Ave min lost/prop/yr.	18.000	15.300	12.700	11.800	10.900	10.000
Penalty collar – our June submission	Ave min lost/prop/yr.		25.000	24.500	24.000	23.500	23.000
Penalty collar – Ofwat DD	Ave min lost/prop/yr.		20.000	20.000	12.000	12.000	12.000
Penalty collar – our revised proposal	Ave min lost/prop/yr.		20.000	20.000	13.800	12.900	12.000
Penalty deadband – our June submission	Ave min lost/prop/yr.		23.000	22.500	22.000	21.500	21.000
Penalty deadband – Ofwat DD	Ave min lost/prop/yr.		18.000	18.000	10.000	10.000	10.000
Penalty deadband – our revised proposal	Ave min lost/prop/yr.		18.000	18.000	11.800	10.900	10.000
Reward deadband	Ave min lost/prop/yr.		10.000	10.000	10.000	10.000	10.000
Reward cap	Ave min lost/prop/yr.		7.000	7.000	7.000	7.000	7.000

Figure 18 - Extract from Ofwat DD Annex 4 Pages 103 & 104 - Performance Commitments

Incentive rates

Incentive type	Performance levels (Average minutes lost / property / year)		Incentive rate (£m/Average minutes lost / property/ year / year)
	Lower	Upper	
Penalty – our June submission	25.000	21.000	5.189
Penalty – Ofwat DD inserted value of our June submission	21.000	23.000	5.189
Penalty – Ofwat DD	10.000	20.000	5.189
Reward	7.000	10.000	3.986

Figure 19 - Extract from Ofwat DD Annex 4 Pages 103 & 104 - Incentive Rates

1.14.4 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is:

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact	P90	Maximum reward
Our June Submission	-51.9	-44.1	-2.3	19.9	59.8
Ofwat DD	-51.9	-51.9	-29.4	19.9	59.8
Our revised proposal	-51.9	-51.9	-28.3	19.9	59.8

Figure 20 - ODI impact Summary

1.15 B2 – Reliable Water Service Index

1.15.1 Interventions made in the Draft Determination

B2: Reliable Water Service Index	
What Ofwat did	Ofwat acknowledged that we have removed the mains bursts sub-measure from the reward calculation.
Why Ofwat did it	We clarified following our 27 th June 2014 resubmission that we had adjusted the incentive regime to ensure that outperformance on mains bursts (an asset health indicator) cannot contribute towards rewards.

Figure 21 - Summary from Ofwat DD Annex 4 Page 108

1.15.2 Our response - Incentive Regime

We accept the proposed changes to the incentive regime for this measure i.e. the removal of the mains burst sub-measure from the reward calculation.

1.15.3 Expectations for the Final Determination

We are not expecting any changes to be made for the Final Determination and have reproduced (below) the agreed Ofwat Annex 4 'Outcomes, performance commitments and outcome delivery incentives' template for this measure.

Incentive type: Financial – reward and penalty.

Performance commitments

	Unit	Starting level	Committed performance levels				
			2014-15	2015-16	2016-17	2017-18	2018-19
PC	Index	100.000	100.000	100.000	100.000	100.000	100.000
Penalty collar	Index		94.000	94.500	95.000	95.500	96.000
Penalty deadband	Index		95.000	95.500	96.000	96.500	97.000
Reward deadband	Index		103.000	103.000	103.000	103.000	103.000
Reward cap	Index		104.000	104.000	104.000	104.000	104.000

Figure 22 - Extract from Ofwat DD Annex 4 Page 106 - Performance Commitments

Incentive rates

Incentive type	Performance levels (Index)		Incentive rate (£m/Index unit/year)
	Lower	Upper	
Penalty	94.000	97.000	7.982
Reward	103.000	104.000	5.981

Figure 23 - Extract from Ofwat DD Annex 4 Page 106 - Incentive Rates

1.15.4 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is:

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact	P90	Maximum reward
Our June Submission	-39.9	-39.9	-3.9	29.9	29.9
Ofwat DD	-39.9	-39.9	-4.6	29.9	29.9
Our revised proposal	-39.9	-39.9	-4.6	29.9	29.9

Figure 24 - ODI impact Summary

1.16 B6 – Thirlmere transfer to West Cumbria

1.16.1 Interventions made in the Draft Determination

B6: Thirlmere transfer into West Cumbria	
What Ofwat did	This performance commitment and its associated outcome delivery incentive are based on United Utilities' proposed costs for the Thirlmere transfer. As we have not approved the costs of this scheme we are provisionally rejecting the performance commitment pending the company resubmitting costs for the scheme which we can approve.
Why Ofwat did it	The position on this performance commitment at final determination is subject to the outcome of the forthcoming Examination in Public on United Utilities' draft water resources management plan. The examination relates to water resource options for West Cumbria.

Figure 25 - Extract from Ofwat DD Annex 4 Page 116

1.16.2 Our response – Reinstatement of the measure

We request Ofwat's reinstatement of the ODI regime for this Measure of Success, as submitted in June 2014, for the reasons provided in the 'Thirlmere transfer into West Cumbria' Draft Determination response document (reference REP05).

As we set out in our June response document RD104 'Water Wholesale cost exclusion – Thirlmere (Tests 2.3 & 4.1), the Thirlmere ODI is necessary to protect customers and remove a disincentive to meet associated environmental obligations. Both the EA and Natural England in their Statements of common ground provide supporting evidence that our proposals provide the best long term solution to both customers and the environment.

The ODI mechanism should remain unchanged from the June response, with the incentive rate remaining at £1.274m for each percentage point. This ensures coverage of both the cost exclusion claim and the implicit allowance, and therefore ensures that customers remain protected to the full extent of the project cost.

1.16.3 Expectations for the Final Determination

We are expecting that this measure will be reinstated in the Final Determination and have provided (below) the equivalent Ofwat Annex 4 'Outcomes, performance commitments and outcome delivery incentives' template for the measure.

Incentive type: Financial – reward and penalty.

Performance commitments

	Unit	Starting level	Committed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	% of project complete based on earned value tied to milestones	0	2	5	21	53	82
Penalty	% of project complete		2	5	21	53	0

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
collar	based on earned value tied to milestones						
Penalty deadband	% of project complete based on earned value tied to milestones		2	5	21	53	82
Reward deadband	% of project complete based on earned value tied to milestones		2	5	21	53	82
Reward cap	% of project complete based on earned value tied to milestones		2	5	21	53	100

Figure 26 - Extract from Ofwat DD Annex 4 Pages 117-120 - Performance Commitments

Incentive rates

Incentive type	Performance levels (% of project complete based on earned value tied to milestones)		Incentive rate (£m/1%/year)
	Lower	Upper	
Penalty	0	82	1.274
Reward	82	100	1.274

Figure 27 - Extract from Ofwat DD Annex 4 Pages 117-120 - Incentive Rates

Additional details

Necessary detail on measurement units	The unit of measure is percentage progress to completion, measured to zero decimal places. The PC targets have been developed based on the latest available project delivery plan. This gives a project in use date of 31/03/2022 (FY22). The project comprises new water mains, a new treatment works and new service reservoirs. Milestones have been defined and weighted in relation to proportion of the baseline project value. The milestones that have been used to define the PC targets are as follows:		
	Estimated completion year	Milestone	Weight (%)
	FY16	Tender documents (scope book) submitted to bidders	1.00

	FY16	Planning application submitted	1.00	
	FY16 total		2.00	2
	FY17	Contract awarded	1.50	
	FY17	Planning application approved	1.50	
	FY17 total		3.00	5
	FY18	Construction started on site	7.66	
	FY18	First 23.12% of main in the ground	8.34	
	FY18 total		16.00	21
	FY19	Substructure of WTW complete	0.85	
	FY19	Substructure of SRs complete	0.85	
	FY19	Next 29.64% of main in the ground	30.30	
	FY19 total		32.00	53
	FY20	Thirlmere [redacted text reason 1] works complete	3.68	
	FY20	Next 27.27% of main in the ground	25.32	
	FY20 total		29.00	82
	FY21	Superstructure of WTW complete	2.18	
	FY21	Next 12.54% of main in the ground	7.82	
	FY21 total		10.00	92
	FY22	SRs complete	0.65	
	FY22	WTW complete	0.65	
	FY22	Final 7.43% of main in the ground	6.71	
	FY22 total		8.00	100
Frequency of PC measurement and any use of averaging	Performance will be assessed annually and reported on a financial year basis			

Timing and frequency of rewards/penalties	This delivery incentive will be applied at the next price determination for the performance year 2015/16 – 2018/19. A cumulative net penalty or reward for all the financial measures within a price control will be calculated. For performance in the year 2019/20, a cumulative net penalty or reward for all the financial measures within a price control will be calculated and applied at AMP 8.
Form of reward/penalty	Where a cumulative net penalty is calculated, this will be applied as a revenue adjustment to ensure customers are fully compensated for any underperformance. Where a cumulative net reward is calculated, this will be applied as an upward adjustment to the RCV, to minimise the short term impact on customer bills.
Any other information or clarifications relevant to correct application of incentive	None.

Figure 28 - Extract from Ofwat DD Annex 4 Pages 117-120 - Additional Details

1.16.4 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is:

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact	P90	Maximum reward
Our June Submission	-104.3	-34.3	-5.1	19.2	23.1
Ofwat DD	0.0	0	0	0	0
Our revised proposal	-104.3	-34.3	-5.1	19.2	23.1

Figure 29 - ODI impact Summary

4. Annex C Wastewater Outcomes

1.17 A1: Private sewers service index

1.17.1 Interventions made in the Draft Determination – Performance commitments

- The performance commitment has been reduced to a value of 100 to represent the best historic performance over the last three years.

1.17.2 Our response- Performance commitments

- We accept the change to the performance commitment made in the Draft Determination for the purpose of this representation.** We continue to believe that, due to the lack of historic data, an average of historic performance provides a more appropriate representation of future performance. However we understand the intention to drive on-going improvements in service.

1.17.3 Interventions made in the Draft Determination – Outcome Delivery Incentives (ODIs)

- The size of the penalty range has been increased to ensure under delivery would not be cost neutral.
- The reward deadband and reward cap have been reduced to reflect the change in the performance commitment.

1.17.4 Our response- Outcome Delivery Incentives (ODIs)

- For the purposes of this representation, we accept the changes to the penalty range, reward deadband and reward cap made in the Draft Determination.**

1.17.5 Expectations for the Final Determination

We have provided (below) the Ofwat Annex 4 ‘Outcomes, performance commitments and outcome delivery incentives’ template for the Private sewers service index. We have replicated the Draft Determination template with our June plan performance targets shown using ~~strikethrough~~, with the agreed Draft Determination performance as the final figure in each row.

Incentive type: Financial – reward and penalty

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	Index	105.8	105.8 100.0	105.8 100.0	105.8 100.0	105.8 100.0	105.8 100.0
Penalty collar	Index		108.8 102.0	108.8 102.0	108.8 102.0	108.8 102.0	108.8 102.0
Penalty deadband	Index		108.3 101.2	108.3 101.2	108.3 101.2	108.3 101.2	108.3 101.2
Reward deadband	Index		100.0 98.8	100.0 98.8	100.0 98.8	100.0 98.8	100.0 98.8

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Reward cap	Index		93.4	93.4	93.4	93.4	93.4
			91.9	91.9	91.9	91.9	91.9

Figure 30 - Extract from Ofwat DD Annex 4 Pages 131 & 132 - Performance Commitments

Incentive rates

Incentive type	Performance levels (index points)		Incentive rate (£m/index point/year)
	Lower	Upper	
Penalty	108.3	108.8	4.208
	101.2	102.0	
Reward	93.4	100.0	1.096
	91.9	98.8	

Figure 31 - Extract from Ofwat DD Annex 4 Pages 131 & 132 - Incentive Rates

1.17.6 Impact of agreed changes on P90, P50 and P10 values

The impact of the proposed ODI change is as follows. The changes in the Draft Determination have increased the potential value of a penalty and reduced the value of the reward.

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact (P50)	P90	Maximum reward
Our June Submission	-12.1	-11.9	4.6	28.8	37.9
Ofwat DD	-16.8	-16.8	-4.4	23.0	37.8
Our acceptance of DD proposal	-16.8	-16.8	-4.4	23.0	37.8

Figure 32 - ODI Impact Summary

1.18 B2: Sewer flooding index

The performance of individual company's wastewater networks is heavily dependent upon factors which are outside of management control.

The inputs to sewer networks are extremely variable depending upon the local balance and nature of trade loads, domestic loads, and most significantly variation and uncertainty in weather. The vast majority of companies' sewerage systems are still broadly the same as those inherited at privatisation. With the rate of investment across the industry meaning that it will take many hundreds of years, and many billions of pounds, before full modernisation of these networks. As a result the assets that companies rely on to provide for customers is widely variable in nature and will require significantly different levels of intervention to deliver comparable levels of customer service.

For United Utilities the inputs to our network are more challenging than the industry norm, as we have significantly more industrial discharges, and higher levels of rainfall on the urban areas than that seen in other regions. Our asset base also has more combined sewers and more connected cellars than other companies, and large areas which are still a long way short of modern design standards.

Combined sewers take both foul and surface water (rain) and therefore experience large fluctuations in flow. The variable flows in combined sewers can result in both the formation of blockages (resulting from low flows in large diameter sewers), and hydraulic overload resulting from periods of heavy rain. Both blockages and hydraulic incapacity are major causes of sewer flooding.

As such the efficient operational costs and cost beneficial performance levels for us is inherently different to those in other regions across England and Wales.

The Draft Determination proposed industry wide upper quartile targets for sewer flooding, and revised deadbands and penalty collars. These two interventions are addressed individually below.

1.18.1 Interventions made in the Draft Determination – Performance commitments

- The performance commitment has been reduced to reflect upper quartile performance by 2017-18.

1.18.2 Our response - Performance commitments

- **We do not believe that it is appropriate to change the performance commitment for this measure.** Our rationale is given below, with detailed evidence to support these conclusions being provided in Appendix A.

The backward looking sewer flooding and network botex models do not make allowance for the magnitude of any required improvement in service which would be required over the AMP6 period. Therefore to apply a 'blanket' upper quartile benchmark target to all companies, without recognising additional costs to make the necessary step change in performance, would significantly disadvantage companies that are further from the upper quartile benchmark.

We also believe that the North West suffers from a unique combination of environmental, social and legacy asset factors that contribute to our current performance level and the large relative distance from upper quartile. As these factors are outside of management control, we believe that these factors should be taken into account when determining upper quartile targets for sewer flooding.

To test this 'belief' we identified (using engineering judgement) a number of 'specific factors' that could explain the high levels of sewer flooding in the United Utilities region.

For each of these 'specific factors' we assessed both our distance from the industry average and the scale of the impact that the factor would make on sewer flooding. Only when a factor passed both 'tests' did we include it in the final stage of our analysis to derive an estimate of upper quartile performance.

For example, whilst United Utilities has significantly more 'critical' sewers than the industry average we could not see a relationship between the criticality of a sewer and its impact on sewer flooding. This factor was therefore excluded from the analysis. Three specific factors, which materially affect United Utilities performance with relation to sewer flooding were identified, namely:

- Amount and intensity of rainfall
- Sewer type and age
- Property type and density

Whilst for many of these factors we are not the furthest from the industry average, it is the unique combination of these factors acting together that, we consider, contributes to our relative performance. For example, high levels of sewer flooding occur when there is both high levels of rainfall and for this rain to fall on areas of high population density (which are likely to be urban areas with extensive sewerage systems). Neither factor on its own would contribute to increased levels of sewer flooding. Whilst a few companies experience higher levels of rainfall than United Utilities, or are more urbanised, the North West is unique if having high levels of both.

The analysis outlined above is described in detail in appendix 1. This appendix sets out the evidence for our distance from the industry average, the link between the factors and sewer flooding, and the regression analysis that we have undertaken to determine a more representative estimate of upper quartile performance.

This regression analysis, taking into consideration the impact of the 'company specific risk factors' calculates that **a more representative upper quartile performance figure for United Utilities would be 697 properties** (net of severe weather) suffering internal flooding per annum. This compares with; our 2013-14 actual performance of 940 properties, the Ofwat upper quartile assessment of 391 properties and our 2019-20 target of 525 properties.

We have also cross checked this conclusion by using a statistical multiple regression model to explain the variation in internal flooding between companies. This model was fitted using the Backward Elimination approach to Stepwise Regression and concluded that the upper quartile performance figure for United Utilities would be 916 properties pa.

We therefore, remain convinced that our June performance commitment to reduce internal flooding by almost 40% and reduce flooding incident numbers to 525 properties per annum, provides both good service and good value for money for our customers and is appropriate and demonstrably stretching when compared to the performance of other companies.

Additional Background to United Utilities sewer flooding programme

At PR09 we set, and have delivered, a target to reduce sewer flooding by over 50% in AMP5, a greater reduction than that achieved by any other company (based on JR10 to JR14 data). The AMP5 service improvement moved United Utilities from an outlier (with respect to other companies) to lower quartile performance. To achieve this level of performance we have invested around 20% more than the FD09 forecast costs. However we recognise that further improvement is still required. This view is supported by customers and stakeholders who expressed strong support for continuing improvement.

For AMP6 we have again, based on feedback from customers and stakeholders, set a target that drives an on-going improvement in sewer flooding. Our AMP6 performance commitment, which will deliver a c40% reduction in internal flooding, is one of the toughest of any company (based on the Draft Determinations and additional information provided by Ofwat to calculate upper quartile). Our 40% target is based on the results from customer 'acceptability testing' research which demonstrated that the bill impact of achieving a greater reduction in internal sewer flooding was not acceptable to the majority of our customers.

The 2017-18 upper quartile target proposed in the Draft Determination would require a reduction in internal sewer flooding of almost 60% compared to our current performance. We have greatly improved our knowledge of the risk factors associated with sewer flooding in the North West (see our December plan for details of our industry leading risk based Sewerage Management Plans). Nevertheless, based upon the unique combination of 'specific factors' outlined above, and our current level of detailed understanding (at a single pipe level) of how our network performs, we do not believe, that it is possible to achieve this level of reduction in one AMP period. As outlined in our December plan, we are currently trialling a number of strategic initiatives to move from a predominantly reactive to a much more proactive approach to reduce sewer flooding (and other service failures) based on increased intelligence from sewer network and sewer overflow monitors. However, as neither the practicality, cost or effectiveness of this approach is currently known, it is not expected to deliver maximum benefits until the end of the AMP6 and AMP7 periods, which will be too late to contribute to achieving the required upper quartile target.

Furthermore the delivery of sustainable drainage solutions, a key part of our future strategy supported by all stakeholders, will again require longer than a single AMP period to fully implement, due to the time taken to build effective partnerships,.

Following the Draft Determination we have discussed the proposed upper quartile target with our Customer Challenge Group. They have reiterated their support for our balanced plan to reduce internal flooding by c40% based on a mixture of storage, sustainable drainage, mitigation, sewer cleaning and local repair type solutions. They have expressed strong concerns that the imposition of an upper quartile target would drive an inappropriate mix of short term solutions, for example sewer cleaning or single property level mitigation. They believe that this would be to the longer term detriment of customers as these solution do not address the overall risk of flooding occurring and simply mask (for a limited period) the consequences.

In addition over the longer term any strategy to reduce sewer flooding (and indeed any other type of flooding) must be based on reducing inputs (in this case rainwater) into the sewerage system and by working in partnership with other stakeholders. A delivery strategy based solely on local short term solutions severely reduces the opportunities for the development of longer term partnership based sustainable drainage solutions.

1.18.3 Interventions made in the Draft Determination - Outcome delivery incentive (ODI)

- The penalty and reward deadbands have been made symmetrical around the revised upper quartile performance commitment based on the average of the deadbands we set in our June plan.
- The penalty collar and reward cap have been made symmetrical around the revised upper quartile performance commitment based on the average of the collar and cap we set in our June plan.

1.18.4 Our response (deadbands)

- **We do not believe that it is appropriate to set symmetrical deadbands for this measure.** Our rationale is given below.

The purpose of setting deadbands is to ensure that penalties or rewards are not earned for performance that is outside of management control, e.g. performance related to adverse or beneficial weather conditions.

Feedback on our December plan indicated that deadbands needed to be appropriate and 'evidence based'. In response to this feedback we developed a detailed statistical model that correlates daily rainfall with numbers of sewer flooding events (see document reference RD216 provided in June), and used this model to set the deadbands in our June plan.

Since our June plan we have subjected our statistical model to external assurance (see Jacobs sewer flooding assurance report document reference REP-K). The assurance report supports the use of our statistical model and states that *“This approach appears sound and logical in deriving a deadband around the reference level target to eliminate the effects of weather which is outside of UU’s control”*.

The use of our statistical model results in a penalty deadband that is visually wider than the reward deadband. This result is in line with our historical observations and engineering judgement, which suggests that the impact of rainfall on sewer flooding would be asymmetric, with high levels of rainfall resulting in a greater increase in flooding (from the average) than the reduction seen in dry years.

In undertaking the assurance Jacobs identified a discrepancy between the targets which excluded severe weather and the data used in the statistical model which included all flooding events. We have therefore re-run our model with flooding due to severe weather removed. The deadbands remain asymmetrical but are now slightly nearer to the performance commitment (the revised deadbands are shown in the Draft Determination ODI template reproduced below).

Given that our proposed deadbands are based on a detailed statistical model of the actual impact of rainfall on sewer flooding, we believe that the deadbands utilised in this measure are robust and appropriate. In the Draft Determination the deadbands have been re-set based on an average of our penalty and reward deadband. This seems to be contrary to the evidence based approach that we have utilised and counter to the expectation that companies would evidence the rationale for deadbands.

Even without any change to the performance commitment, the narrowing of the penalty deadband in the Draft Determination would significantly increase our risk of suffering a penalty in AMP6, resulting from rainfall events outside of management control. This is clearly demonstrated by the chart below which superimposes historical performance (based on June Return data) on the Draft Determination deadbands.

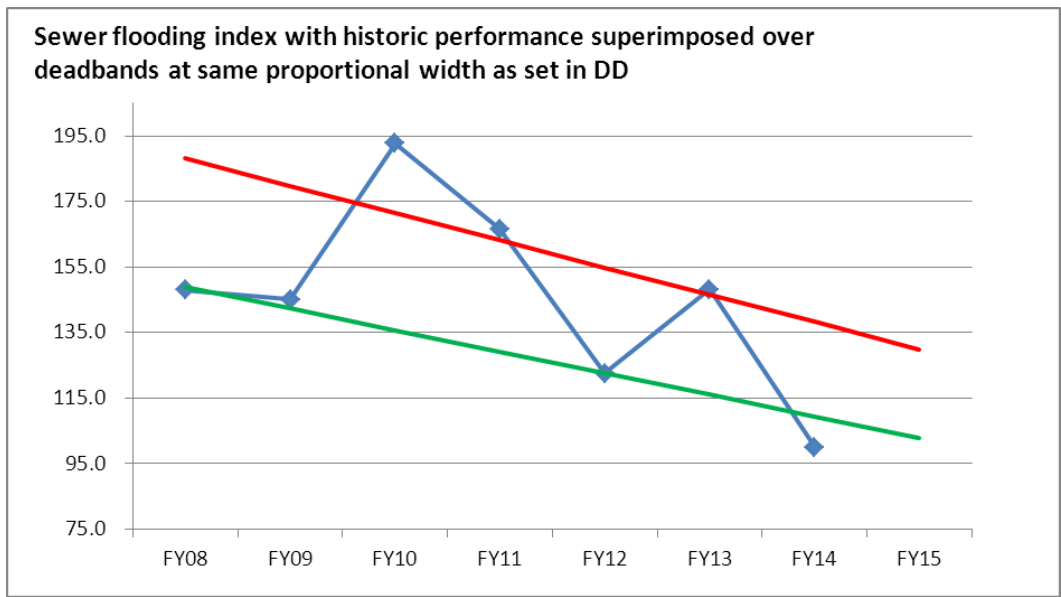


Figure 33 – Sewer flooding index with historic performance superimposed over deadbands

We are very concerned that the proposed penalty deadband would offer little protection against weather events, assuming that future variability in flooding numbers is similar to historical variability. Our analysis shows that if we apply the Draft Determination deadbands (and associated cap and collar)

to our June plan the P10 penalty increases from c£40m to over £90m, whilst the P90 reward reduces to zero.

Ofwat should consider whether this form of dead-band is appropriate, likely to incentivise efficient investment and protect customers, given that it potentially results in the imposition of a c£90m penalty for variability in performance driven by weather events outside of management control.

1.18.5 Our response (the penalty collar)

- **We are accepting the value of the penalty and the basis that dead bands and penalty collar should be varied to maintain this penalty level.** Our rationale is given below.

The penalty collar in our June plan was set to work in conjunction with the penalty deadband at a level to fully protect customers against any under delivery. Therefore any changes to the collar must be undertaken in conjunction with changes to the penalty deadband.

The ODI incentive regime has been designed to work alongside the totex incentive regime to ensure that customers would be fully compensated for any under delivery. The mechanism works such that if we failed to invest to meet our performance commitment, then under the AMP6 totex incentive mechanism customers would be compensated for approximately 50% of the avoided expenditure.

The ODI regime (the combination of the penalty deadband and penalty collar) would then act to increase the effective penalty to a level that would recover a further 50% of the totex expenditure, such that the full totex value of the sewer flooding programme would be returned to customers.

Therefore we consider that a maximum penalty for under delivery of this measure of £105m (which is in-line with the maximum level of penalty implicit in the Draft Determination) is, in conjunction with the totex incentive regime, appropriate to fully protect customers. Therefore as we have proposed a change to the penalty deadband from that set in the Draft Determination, we have also re-set the level of the penalty collar to retain a maximum penalty of around £105m.

1.18.6 Our response (the reward cap)

- **We do not believe that it is appropriate to change the reward cap for this measure.** Our rationale is given below.

The reward cap in our June plan is based on customer WTP data. It is set at a level beyond which we do not have evidence that customers are willing to pay for further performance improvements in internal and external flooding. Therefore it seems counter-intuitive to move the reward cap from a level for which we have customer support (based on our WTP research); to a level based simply on the average of the penalty collar and reward cap we set in our June plan.

1.18.7 Expectations for the Final Determination

We have provided (below) the Ofwat Annex 4 'Outcomes, performance commitments and outcome delivery incentives' template for the Sewer flooding index. We have replicated the Draft Determination template but have shown both our June plan and the Draft Determination performance targets using ~~strike through~~. We have re-stated our proposed June performance commitment, and included revised deadbands, collar and cap, as the last figure in each row.

Detailed definition of performance measure (changed from text in Draft Determination)

This performance commitment provides an assessment of actual performance with respect to reducing sewer flooding, and provides a direct measure of customer experience. It combines internal flooding, external flooding and repeat flooding caused by either hydraulic incapacity or other causes. The reduction in this index over AMP6 represents an improvement in service.

Incentive type: Financial – reward and penalty

Performance commitments

	Unit	Starting level	Committed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	Index	101.6	97.3	91.5	83.8	76.6	72.3
			92.5	82.7	72.2	68.5	66.3
			97.3	91.5	83.8	76.6	72.3
Penalty collar	Index		125.2	118.2	108.8	100.2	95.1
			114.1	102.7	90.5	86.9	84.8
			123.5	116.6	107.5	99.1	94.1
Penalty deadband	Index		114.8	107.8	98.5	90.0	84.9
			103.6	92.5	80.6	76.4	74.0
			113.1	106.2	97.1	88.7	83.7
Reward deadband	Index		91.5	86.1	78.9	72.2	68.2
			81.4	72.9	63.7	60.5	58.6
			92.0	86.5	79.3	72.5	68.5
Reward cap	Index		79.8	73.9	66.2	59.0	54.8
			70.9	62.7	53.8	50.1	47.8
			79.8	73.9	66.2	59.0	54.8

Figure 34 - Extract from Ofwat DD Annex 4 Pages 137 & 138 - Performance Commitments

Incentive rates

Incentive type	Performance levels (index points)		Incentive rate (£m/index point/year)
	Lower	Upper	
Penalty	84.9	125.2	2.035
	74.0	114.1	
	83.7	123.5	
Reward	68.4	91.5	1.077
	47.8	81.4	
	54.8	92.0	

Figure 35 - Extract from Ofwat DD Annex 4 Pages 137 & 138 - Incentive Rates

Additional details (changed from the Draft Determination)

Necessary detail on measurement units

The number of properties and areas flooding is produced using the same approach as that used historically to complete the June Return Tables 3 and 3a. Repeat flooding is produced in accordance with the Ofwat Key Performance Indicator Guidance document. All flooding events due to hydraulic incapacity including repeat flooding are net of severe weather defined (as in AMP5) as a storm with a return period greater than 1 in 20 years, including flooding at properties on the flooding register. The PC does not include flooding from the transferred assets as this is included in the private sewers service index.

Figure 36 - Extract from Ofwat DD Annex 4 Pages 137 & 138 - Additional Details

1.18.8 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is given below. We have maintained the maximum penalty at a value of around £105m to fully (in conjunction with the totex incentive mechanism) protect customers. The P10 penalty and P90 reward have both increases as a result of removing severe weather from our deadband calculation.

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact (P50)	P90	Maximum reward
Our June Submission	-104.7	-42.1	-4.7	21.1	60.4
Ofwat DD	-105.6	-105.6	-47.5	Zero	55.8
Our revised proposal	-105.8	-56.8	-5.6	24.5	70.2

Figure 37 - ODI Impact Summary

1.19 D1: Protecting rivers from deterioration due to population growth

1.19.1 Interventions made in the Draft Determination

- This measure has been changed from 'reward and penalty' to 'penalty only'.

1.19.2 Our response – reward and penalty

- For the purposes of this representation, we will accept the changes to the nature of this ODI.

1.19.3 Feedback received post Draft Determination

- Concerns were raised by Ofwat that the prospective trade growth at Davyhulme WwTW might not occur in AMP6, and therefore customers would not be protected in the event that the supply demand element of the Davyhulme scheme was not required.

1.19.4 Our response – Ofwat feedback

- For the purposes of this representation, we have significantly increased the penalty associated with non-delivery of the Davyhulme supply demand scheme.

To protect customers and ensure a significantly higher penalty for non-deliver than was included in our June plan we have increased the benefit (based on length of river protected) associated with the Davyhulme supply demand scheme.

The river length used in our business plan was just over 25km and reflected the length of river to the next major WwTW input. We are proposing that this length is increased to 125.6km to provide a more proportionate penalty for late or non-delivery of the scheme.

The proposed increase to the benefit (in river length) will increase the annual penalty for non-delivery of the Davyhulme supply demand scheme from £1.3m per year in our June plan to £7.2m per year in this representation. This equates to a full AMP penalty of £14.4m, based on the proposed project delivery date, which in conjunction with the totex incentive mechanism provides a level of penalty to more effectively protect customers against any non-delivery.

1.19.5 Expectations for the Final Determination

- We have provided (below) the Ofwat Annex 4 'Outcomes, performance commitments and outcome delivery incentives' template for the protecting rivers from deterioration measure with the change to the performance commitment target and reward shown using ~~strikethrough~~.

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	km	0.0	1.8	1.8	89.7 190.1	216.2 316.7	246.4 346.6
Penalty collar	km		0.0	0.0	0.0	0.0	0.0
Penalty deadband	km		1.8	1.8	89.7 190.1	216.2 316.7	246.4 346.6

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Reward deadband	km		1.8	1.8	89.7	216.2	246.1
Reward cap	km		3.6	3.6	179.4	432.4	492.2

Figure 38 - Extract from Ofwat DD Annex 4 Pages 143 & 144 - Performance Commitments

Incentive rates

Incentive type	Performance levels (km river)		Incentive rate (£m/km/year)
	Lower	Upper	
Penalty	0.0	246.1	0.051
		346.6	0.058*
Reward	1.8	492.2	0.032

Figure 39 - Extract from Ofwat DD Annex 4 Pages 143 & 144 - Incentive Rates

* The incentive rate has increased slightly due to the change in the river length associated with supply demand schemes protecting rivers at poor or marginal water quality status.

1.19.6 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is as follows. The increase in the maximum and P10 penalty resulting from the change to the performance commitment can clearly be seen.

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact (P50)	P90	Maximum reward
Our June Submission	-28.1	-5.5	-1.5	2.0	17.6
Ofwat DD	-28.1	-5.5	-2.1	Zero	Zero
Our revised proposal	-49.4	-9.8	-3.1	Zero	Zero

Figure 40 - ODI Impact Summary

1.20 D2: Maintaining our wastewater treatment works

1.20.1 Interventions made in the Draft Determination

- The penalty deadband and penalty collar have been reduced in line with the reduction in the performance commitment we proposed as a result of Ofwat feedback in July.

1.20.2 Our response

- **We accept the principle that the penalty deadband and penalty collar should reduce in line with the performance commitment.**
- Following the Draft Determination we have reviewed how this measure will be applied in practice and propose the following changes (see below) to the calculation of the performance commitment. The purpose of these changes are both; to better protect customers from under delivery resulting from the failure of our very largest WwTW and to ensure that the potential increase in the penalty (resulting from the changes in the Draft Determination) is more proportionate to the potential environmental impact of failure.
- As a consequence of these revisions we are proposing that the penalty deadband and collar are revised to ensure that the value of the P10 and maximum penalty remains unchanged from the Draft Determination

1.20.3 Description of proposed change to the performance commitment

Our June ODI methodology for this index gave equal weighting to all of our large (size band 6) wastewater treatment works (WwTW) regardless of the actual number of customers being served by each works. WwTW's in size band 6 have a massive range in population equivalent (PE). For example Horwich, [redacted text reason 1] has a population equivalent of [redacted text reason 1], whilst Davyhulme, our [redacted text reason 1], has a population equivalent of [redacted text reason 1]. Thus, in terms of population equivalent Davyhulme is [redacted text reason 1] Horwich, but failure would have resulted in the same penalty under our June methodology. This led to a bias in the penalty mechanism where the very largest sites had no bigger penalty than the smallest size band 6 works. We believe that the ODI regime better protects customers, and incentivises correct behaviours, when the penalty is proportional to the number of customers (and hence potential environmental impact) served by a failing works.

In revising the calculation methodology for this measure we have retained:

- The target of zero failing works by calendar year 2020.
- The predicted number of small, medium and large works failing in each year of AMP6.
- The value of the P10 penalty included in the Draft Determination.

In revising the calculation methodology for this measure we have changed:

- The weighting to be applied to small, medium and large works categories in the calculation of the ODI.
- We have split the large (size band 6) category into two equal categories (named larger works and very large works in the tables below) based on population equivalent.
- We have re-calculated the penalty rate based on the numeric value of the new index.

The detail of these changes and the impact on the potential penalty is described below.

The total population equivalent served by all size band 6 works was calculated as 7.7m. The sites in this banding were placed in ascending order of population equivalent and then grouped into two equal categories so that each category served the same number of cumulative customers (approx. 3.9m).

The new large works category (the smaller size band 6 works) incorporated 54 of the 65 works within the original band, with the new very large works category including the remaining 11 size band 6 works.

Each category in the index (including the original small and medium sized works categories) was assigned a new weighting within the index between one and ten. This was calculated by taking the average population equivalent of the works in each category, taking the square root of that number and reflecting the difference in the four numbers in terms of a ratio. This means that the resulting weighting is now better correlated to population equivalent than it was previously.

The WwTW size band categories, weightings, and potential penalty for both the June and proposed new calculation methodology are given in the tables below. This clearly demonstrates that the penalty is now much more proportionate to the number of customers (and hence potential environmental impact) served by a failing works and the increased penalty resulting from the failure of our largest WwTW.

June weightings

	Weighting	No. of works in Category	Index points for a failing Works	Penalty incentive rate (£m)	Associated penalty for failing works above deadband (£m)
Small (size band 1-4)	4	476	8.82	£0.628	£5.54
Medium (size band 5)	5	29	11.03	£0.628	£6.93
Large (size band 6)	10	65	22.05	£0.628	£13.85

Figure 41 - June weightings for small, medium and large wastewater treatment works

Proposed new weightings

	Weighting	No. of works in Category	Index points for a failing Works	Penalty incentive rate (£m)	Associated penalty for failing works above deadband (£m)
Small (size band 1-4)	1	476	4.1	£0.577	£2.37
Medium (size band 5)	2	29	8.19	£0.577	£4.73
Large (size band 6a)	4	54	16.39	£0.577	£9.46
Very large (size band 6b)	10	11	40.97	£0.577	£23.64

Figure 42 - Proposed new weightings for small, medium, large and very large wastewater treatment works

The table below gives the revised weightings, predicted number of failing works over AMP6 and a worked example of the calculation for the revised index. The table is in the same format and is directly comparable with the table included in our ODI pro-forma (document reference RD050) submitted with our June plan.

Sub-measure proposed targets	Size of WwTW	Weight	2013	2014	2015	2016	2017	2018	2019	2020 (AMP7)	Example calculation of weighted score and PC for 2019 (numbers may not sum due to rounding)
Number of WwTW failing EA permit	Small (size band 1-4)	1	2	0	1	1	1	0	0	0	$W_1 = 0 \times 1 = 0$
	Medium (size band 5)	2	0	0	1	1	1	1	0	0	$W_2 = 0 \times 2 = 0$
	Large (size band 6a)	4	2	6	1	1	1	2	2	0	$W_3 = 2 \times 4 = 8$
	Very large (size band 6b)	10	1	0	1	1	1	0	0	0	$W_4 = 0 \times 10 = 0$
Number of WwTW at high risk of failing EA permit	Small (size band 1-4)	0.02	16	10	12	12	12	12	12	12	$W_5 = 12 \times 0.02 = 0.24$
	Medium (size band 5)	0.04	2	1	1	1	1	1	1	1	$W_6 = 1 \times 0.04 = 0.04$
	Large % V.large (all size band 6)	0.20	6	3	4	4	4	4	4	4	$W_7 = 4 \times 0.20 = 0.8$
Number of WwTW at medium risk of failing EA permit	Small (size band 1-4)	0.01	53	52	44	44	44	44	44	42	$W_8 = 44 \times 0.01 = 0.44$
	Medium (size band 5)	0.02	9	8	7	7	7	7	7	7	$W_9 = 7 \times 0.02 = 0.14$
	Large & V.large (all size band 6)	0.10	21	23	16	16	16	16	16	16	$W_{10} = 16 \times 0.10 = 1.6$
PC			100	114	83.00	83.00	83.00	54.32	46.13	13.27	$PC = \sum(W_1 - W_{10}) \times 4.0967$

Figure 43 - Revised weightings and predicted number of failing works over AMP6

1.20.4 The rationale for the penalty deadband and collar

- We have set the penalty deadband and penalty collar at a level that ensures that the value of the P10 and maximum penalty remains broadly unchanged from that in the Draft Determination. The penalty deadband is set at a level that results in an immediate penalty if we have the failure of one very large WwTW above the PC.
- As this is a 'penalty only' ODI, no reward deadband or cap has been set.

1.20.5 Expectations for the Final Determination

We have provided (below) an amended version of the Ofwat Draft Determination Annex 4 'Outcomes, performance commitments and outcome delivery incentives template for our maintaining our wastewater treatment works measure with the proposed changes indicated using a ~~strike through~~.

Incentive type: Financial – penalty only

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014	2015	2016	2017	2018	2019
PC	Index	98.28 113.97	76.23 83.00	76.23 83.00	76.23 83.00	65.20 54.32	56.38 46.13
Penalty collar	Index		141.00 155.40	141.00 155.40	141.00 155.40	141.00 129.97 126.72	141.00 121.15 118.53
Penalty deadband	Index		102.36 113.30	102.36 113.30	102.36 113.30	102.36 91.33 84.62	102.36 82.54 76.43

Figure 44 - Extract from Ofwat DD Annex 4 Pages 145 & 146 - Performance Commitments

Incentive rates

Incentive type	Performance levels (index points)		Incentive rate (£m/index point/year)
	Lower	Upper	
Penalty	102.36 76.43	141.00 155.40	0.628 0.577

Figure 45 - Extract from Ofwat DD Annex 4 Pages 145 & 146 - Incentive Rates

Additional details (if changed from the Draft Determination)

<p>Necessary detail on measurement units</p>	<p>The number of failing wastewater treatment works is assessed from all Water Resource Act sanitary, non-sanitary and 99% dose UV Compliance conditions in addition to Urban Wastewater Treatment Directive BOD, N and P conditions. Flow, Descriptive conditions and failure caused by factors outside of company control, where the Environment Agency accept the reasons for failure, are excluded from the assessment.</p> <p>We have specifically excluded compliance with descriptive permits as we considered that the compliance assessment of these works is subjective. Without a comprehensive data set to provide a single assured view of performance and compliance it is not appropriate to include within our performance baseline. We are and will continue to work with the Agency to ensure that a better understanding of asset compliance with descriptive permits is developed. We envisage that greater understanding in this area will enable the inclusion of descriptive permit compliance assessment as part of this ODI in the future.</p> <p>The number of at risk works is established from a monthly risk assessment made up of all operator self-monitoring and routine samples collected with the result compared against the active consent limit.</p> <p>For each sub-measure, the data will be collected using a methodology consistent with that used historically for the annual Regulatory Reporting submission.</p>
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The PC is calculated as a weighted score by multiplying the number of failing and 'at risk' works by weighting factors based on population equivalent.

Figure 46 - Extract from Ofwat DD Annex 4 Pages 145 & 146 - Additional Details

1.20.6 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is given below. As can be seen we have ensured that our revised proposal produces a maximum and P10 penalty broadly in-line with those implicit in the Draft Determination.

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact (P50)	P90	Maximum reward
Our June Submission	-121.4	-45.8	-8.6	9.4	22.6
Ofwat DD	-121.4	-65.3	-15.6	Zero	Zero
Our revised proposal	-121.5	-65.4	-14.2	Zero	Zero

Figure 47 - ODI Impact Summary

1.21 D3: Contribution to rivers improved (wastewater programme)

1.21.1 Interventions made in the Draft Determination - Performance commitments

- We understand from the Draft Determination that there are concerns regarding the inclusion in our Business Plan of £43m of expenditure to mobilise projects which we expect that we will deliver in AMP7 under the Water Framework Directive.

1.21.2 Our response- Performance commitments

- **Due to the uncertainties related to the 'Early Start' programme we have removed the expenditure from our plan.** Within our performance commitment we had included a river length equivalent of 24.23km directly associated with the 'Early Start' investment and as a result we propose a double sided adjustment to remove this from our performance commitment (see table below). Further rationale for this position is given in the 'Ww Exclusion – Water Framework Directive programme' exclusion document

1.21.3 Interventions made in the Draft Determination - Outcome delivery incentives (ODI)

- Confirmation sought that the penalty rate set in our June plan is sufficient to protect customers in the event of non-delivery of the NEP 3 and 4 Biodiversity (phosphorus removal in Windermere) schemes.

1.21.4 Our response - Outcome delivery incentives (ODI)

- **We believe that the penalty rate we set in our June plan is appropriate to protect customers.** Our rationale is given below.

Our penalty rate is based on the value (from our WTP research) our customers place on protecting rivers in the North West and is calculated in compliance with the methodology set out in Appendix 1 of the Final Methodology document.

Based on further feedback received at the Ofwat/United Utilities meeting of 5 September 2014, we understand that Ofwat have concerns regarding the permit requirements that will be imposed by the Environment Agency with respect to the Windermere schemes.

We have now received further written confirmation from the Environment Agency (see letter included as Appendix 3) confirming the statutory requirement for the delivery of the Windermere schemes in the AMP6 period and confirming the permitted phosphorus limit for Windermere and Ambleside wastewater treatment works, as included in NEP4.

1.21.5 Expectations for the Final Determination

We have provided (below) an amended version of the Ofwat Draft Determination Annex 4 'Outcomes, performance commitments and outcome delivery incentives' template for our Contribution to rivers improved measure with the proposed changes shown below the Draft Determination using a ~~strike through~~.

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	km	0.00	0.75	25.47	104.58	151.83	379.45 355.22
Penalty collar	km		0.00	0.00	0.00	0.00	0.00
Penalty deadband	km		0.75	25.47	104.58	151.83	379.45 355.22
Reward deadband	km		0.75	25.47	104.58	151.83	379.45 355.22
Reward cap	km		1.50	50.95	209.17	303.67	758.94 710.44

Figure 48 - Extract from Ofwat DD Annex 4 Pages 148 - Performance Commitments

Incentive rates

Incentive type	Performance levels (km river)		Incentive rate (£m/km/year)
	Lower	Upper	
Penalty	0.00	379.45 355.22	0.112
Reward	0.75	758.94 710.44	0.029

Figure 49 - Extract from Ofwat DD Annex 4 Pages 148 - Incentive Rates

1.21.6 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is given below. The penalty and reward has reduced due to the change in the performance commitment.

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact (P50)	P90	Maximum reward
Our June Submission	-74.1	-10.7	-2.5	2.7	19.0
Ofwat DD	-74.1	-10.7	-2.5	2.7	19.0
Our revised proposal	-71.4	-10.5	-2.4	2.7	18.3

Figure 50 - ODI Impact Summary

1.22 D4: Wastewater Pollution index

1.22.1 Interventions made in the Draft Determination

- The size of the penalty range has been increased to ensure under delivery would not be cost neutral.
- The proposal to change this measure to 'reward and penalty' was, provisionally, not accepted based on feedback from the Environment Agency that it should not be possible to earn rewards in relation to category 1 and category 2 pollution incidents.
 - Additional information was sought on the source of the incremental WTP and incremental costs used in the measure and confirmation that its reward would be stretching.

1.22.2 Our response

- **We accept the value of the penalty resulting from the change to the penalty range in the Draft Determination**
- **In response to the Draft Determination feedback we have modified our wastewater pollution index to ensure that rewards cannot be earned for category 1 and category 2 pollution incidents.** The proposed changes to the measure are described below.

We have split our wastewater pollution index into two separate measures based on serious category 1 and 2 incidents (one measure) and less serious category 3 pollution incidents (a second measure).

For the category 1 and 2 incidents measure we have set the incentive regime as 'penalty only' to ensure that, in line with Environment Agency expectations, rewards cannot be earned for serious incidents. We have set the December 2020 target (calendar year 2020 at start of AMP7) for this measure at zero serious pollution incidents, again in compliance with Environment Agency expectations. For the five year period 2015 to 2019 we have retained the sub-measure target for category 1 and 2 pollution incidents as included in our June plan (see document RD050 – Wastewater ODI Performance Commitment Pro-forma).

For the category 3 measure we have set the incentive regime as 'reward and penalty' based on strong customer and stakeholder support for a continuing improvement in pollution. We have retained the upper quartile target and deadbands included in our June wastewater pollution index to ensure that we only earn reward for stretching performance.

The rationale for the deadbands, cap and collar

- Wastewater serious (category 1 and 2) pollution incidents:
 - The penalty deadband for this measure has been set at two category 1 or category 2 pollution incidents above the performance commitment, to account for minor variations in performance outside of management control.
 - The penalty collar for this measure has been set in conjunction with that of our category 3 incidents measure to provide an overall penalty (for both measures) at the same level as that set in the Draft Determination for the wastewater pollution index. We have apportioned the total penalty between our two new measures based on the weightings for category 1 & 2 and category 3 pollution incidents from our wastewater pollution index. We consider that this protects customers by providing appropriate financial compensation for under delivery.
 - As this is a 'penalty only' ODI, no reward deadband or cap has been set.
- Wastewater category 3 pollution incidents:
 - The deadbands have been set at seven category 3 pollution incidents above and below the performance commitment. This is unchanged from our June plan and allows for minor variations in performance due to weather events.
 - See above for rationale used to set the penalty collar.

- The cap has been set at the limit beyond which we have no evidence that customers are willing to pay for further improvement in reducing pollution incidents (see Table 3.2a in our PR14 Stage 1 Customer Valuation Study – June document reference RD-N).

1.22.3 Expectations for the Final Determination

We have provided (below) an amended version of the Ofwat Draft Determination Annex 4 ‘Outcomes, performance commitments and outcome delivery incentives’ template for the two new wastewater pollution measures. These two new measures will replace the wastewater pollution index measure included in our June plan and Annex 4 of the Draft Determination.

1.22.4 Performance commitment S-D4a: Wastewater serious (category 1 and 2) pollution incidents

Detailed definition of performance measure

The number of category 1 and 2 pollution incidents attributable to United Utilities wastewater assets (excluding transferred sewers and pumping stations).

Incentive type: Financial – penalty only

Performance commitments

	Unit	Starting level	Committed performance levels (based on calendar years)				
		2014	2015	2016	2017	2018	2019
PC	No/yr	4	4	4	3	3	2
Penalty collar	No/yr		7	7	6	6	5
Penalty deadband	No/yr		6	6	5	5	4

Figure 51 – Performance Commitments for Wastewater Category 1 & 2 Incidents

Incentive rates

Incentive type	Performance levels (incidents)		Incentive rate (£m/incident/year)
	Lower	Upper	
Penalty	4	7	0.424

Figure 52 – Incentive Rates for Wastewater Category 1 & 2 Incidents

Additional details (if changed from the Draft Determination)

Necessary detail on measurement units	<p>The performance commitment includes category 1 and category 2 pollution incidents from sewers (foul, combined and surface water), rising mains, pumping stations, combined sewer overflows, detention tanks, wastewater treatment works and sludge assets.</p> <p>The data will be collected using a methodology consistent with that used historically for the annual Regulatory Reporting submission.</p> <p>This PC excludes pollution incidents:</p> <ul style="list-style-type: none"> • That arise solely through data provided by the EDM1 or EDM2 event monitors installed as part of the NEP.
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- Where assets have performed in compliance with their permits
- From private sewers and pumping stations which are included in our Private Sewers Service index
- From water treatment works and water distribution systems.

Figure 53 – Additional Details for Wastewater Category 1 & 2 Incidents

1.22.5 Performance commitment S-D4b: Wastewater category 3 pollution incidents

Detailed definition of performance measure

The number of category 3 pollution incidents attributable to United Utilities wastewater assets (excluding transferred sewers and pumping stations).

Incentive type: Financial – reward and penalty

Performance commitments

	Unit	Starting level	Committed performance levels (based on calendar years)				
		2014	2015	2016	2017	2018	2019
PC	No/yr	207	204	201	198	195	191
Penalty collar	No/yr		223	220	217	214	210
Penalty deadband	No/yr		211	208	205	202	198
Reward deadband	No/yr		197	194	191	188	184
Reward cap	No/yr		113	110	107	104	100

Figure 54 - Performance Commitments for Wastewater Category 3 Incidents

Incentive rates

Incentive type	Performance levels (incidents)		Incentive rate (£m/incident/year)
	Lower	Upper	
Penalty	198	223	0.283
Reward	100	197	0.153

Figure 55 - Incentive Rates for Wastewater Category 3 Incidents

Additional details (if changed from the Draft Determination)

Necessary detail on measurement units	<p>The performance commitment includes category 3 pollution incidents from sewers (foul, combined and surface water), rising mains, pumping stations, combined sewer overflows, detention tanks, wastewater treatment works and sludge assets. Category 4 pollution incidents are not included in this assessment due to their lack of impact, but they are monitored and discussed with the Environment Agency.</p> <p>The data will be collected using a methodology consistent with that used historically for the annual Regulatory Reporting submission.</p>
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This PC excludes pollution incidents:

- That arise solely through data provided by the EDM1 or EDM2 event monitors installed as part of the NEP.
- Where assets have performed in compliance with their permits
- From private sewers and pumping stations which are included in our Private Sewers Service index
- From water treatment works and water distribution systems.

Figure 56 - Additional Details for Wastewater Category 3 Incidents

Additional information on the source of the incremental WTP and incremental costs used in the measure and confirmation that its reward would be stretching

(1) Link to customer WTP research

We have used the gain benefit values for pollution incidents from our PR14 customer WTP research (see document 'RD-N:ODI Risk and Reward WTP Review' submitted as part of our June plan) to calculate the penalty and reward incentive rates. For our PR14 customer WTP research we asked customers to value a reduction in pollution down to 180 incidents per year (defined as level +1) and 100 incidents per year (defined as level +2).

As our current performance is already very near the +1 level we have used this (level +1) WTP valuation of £0.611m to calculate the penalty rate for our category 1 and 2 pollution PC, and the level +2 WTP valuation of £0.306m to calculate the reward and penalty rate for category 3 pollution incidents. The use of separate values for differing levels of performance is consistent with the views of our customers and allows for a differentiation of penalty between the two pollution measures.

(2) Calculation of ODI penalty and reward incentive rates

- The ODI penalty and reward rates has been calculated using the formula provided in Appendix 1 of the Final Methodology document as follows:
 - $\text{ODI penalty incentive rate} = \text{incremental WTP} - (\text{incremental cost} * 0.5)$
 - $\text{ODI reward incentive rate} = \text{incremental WTP} * (1 - 0.5)$
- The incremental WTP rate has been calculated from the relevant WTP valuation (for category 1 and 2, or category 3 incidents) multiplied by the improvement planned for AMP6, divided by the change in the performance commitment over AMP6.
- The incremental cost has been calculated as the whole life annualised totex divided by the change in the performance commitment delivered over AMP6. The incremental totex in our plan for reducing pollution incidents includes £18m for the installation of event duration monitors at intermittent discharges under the NEP EDM1 and 2 drivers and £12m for the delivery of our wastewater network strategic initiative to allow pro-active detection and response to adverse operating conditions. We have simply split the totex from the wastewater pollution index 50:50 between our two new pollution measures as it is difficult to differentiate between investment to reduce category 1, 2 or 3 pollution incidents.
- See table below for worked example for the calculation of the incremental WTP, the incremental cost and the penalty and reward incentive rates for both the 'Wastewater serious (category 1 and 2) pollution incidents' and the 'Wastewater category 3 pollution incidents' measures. The table is in the same format as our ODI pro-forma (document reference RD050) submitted with our June plan.

Calculation of the incremental WtP for serious pollution measure (numbers may not sum due to rounding)					
Benefit criteria	WtP gain valuation (a)	Improvement delivered over AMP6 (b)	Annualised WtP (a*b)	Improvement in PC over AMP6	Incremental WtP (£m/incident/pa)
Category 1 and 2 pollution incidents	£0.611m per incident pa (WTP value)	2 incidents pa	611*2=£1.222m	2 incidents pa	Incremental WtP = £1.222m/2 = £0.611m/cat 1 or 2 incident/pa
Calculation of the incremental cost for serious pollution measure (numbers may not sum due to rounding)					
(1) Annualisation factors are from document RD005 - Outcome Delivery Incentives and Cost Benefit Approach					
Asset life	Annualisation factor ₍₁₎ (a)	Planned Totex £m (b)	Annualised cost (a*b)	Improvement in PC over AMP6	Incremental cost (£m/incident/pa)
Very short	0.2148	0.001	0.000		
Short	0.1083	6.247	0.677		
Medium	0.0630	1.064	0.067		
Medium long	0.0466	0.033	0.002		
Long	0.0402	2.618	0.105		
Infrastructure	0.0358	4.782	0.171		
Opex pa	1.0000	-0.275	-0.275		
Total for index			£0.747m	2 incidents pa	Incremental Cost = £0.747m/2 = £0.373m/cat 1 or 2 incident/pa
Calculation of the ODI penalty incentive rate for serious pollution measure					
ODI penalty rate = incremental WtP – (incremental cost* 0.5)					
ODI penalty rate = 0.611 – (0.373*0.5) = £0.424m/cat 1 or 2 incident/pa					

Figure 57 - Calculation of the incremental WtP for serious pollution measure

Calculation of the incremental WtP for category 3 measure (numbers may not sum due to rounding)					
Benefit criteria	WtP gain valuation (a)	Improvement delivered over AMP6 (b)	Annualised WtP (a*b)	Improvement in PC over AMP6	Incremental WtP (£m/incident/pa)
Category 3 pollution incidents	£0.306m per incident pa (WTP value)	16 incidents pa	306*16=£4.899m	16 incidents pa	Incremental WtP = £4.899m/16 = £0.306m/cat 3 incident/pa
Calculation of the incremental cost for category 3 measure (numbers may not sum due to rounding)					
(1) Annualisation factors are from document RD005 - Outcome Delivery Incentives and Cost Benefit Approach					
Asset life	Annualisation factor ₍₁₎ (a)	Planned Totex £m (b)	Annualised cost (a*b)	Improvement in PC over AMP6	Incremental cost (£m/incident/pa)
Very short	0.2148	0.001	0.000		
Short	0.1083	6.247	0.677		
Medium	0.0630	1.064	0.067		
Medium long	0.0466	0.033	0.002		
Long	0.0402	2.618	0.105		
Infrastructure	0.0358	4.782	0.171		
Opex pa	1.0000	-0.275	-0.275		
Total for index			£0.747m	16 incidents pa	Incremental Cost = £0.747m/16 = £0.047m/cat 3

	incident/pa
Calculation of the ODI penalty incentive rate for category 3 pollution measure	
ODI penalty rate = incremental WTP – (incremental cost* 0.5)	
ODI penalty rate = 0.306 – (0.047*0.5) = £0.283m/cat 3 incident/pa	
Calculation of the ODI reward incentive rate for category 3 pollution measure	
ODI reward rate = incremental WTP*(1-0.5)	
ODI reward rate = 0.306*(1-0.5) = £0.153m/cat 3 incident/pa	

Figure 58 - Calculation of the incremental WTP for category 3 measure

(3) Confirmation that rewards are only earned for stretching performance

Both our current performance for category 3 pollution incidents (based on the Environment Agency MD109 return for 2014) and our planned performance for 2019-20 represent upper quartile performance. Therefore in line with the guidance in the Ofwat letter of 12 August to Regulatory Directors that companies only gain rewards “as a result of performance at an upper quartile or equivalent level”, we believe that the achievement of reward for our wastewater category 3 pollution incidents measure is consistent with this guidance.

Both our customers and stakeholders expressed strong support for a continuing improvement in pollution. Therefore, based on this feedback we believe that it is appropriate that we should earn reward for improving performance beyond upper quartile performance.

1.22.6 Impact on P90, P50 and P10 Analysis

The impact of the proposed ODI change is given below. We have maintained the maximum and P10 penalty values in line with those implied in the Draft Determination. We have added a reward.

£m AMP6 Total	Maximum penalty	P10	Central estimate of impact (P50)	P90	Maximum reward
Our June Submission	-5.9	-5.9	-2.1	Zero	Zero
Ofwat DD	-18.7	-18.7	-6.1	Zero	Zero
Our revised proposal (combined values for the two new measures)	-19.1	-19.1	-1.2	12.5	64.3

Figure 59 - ODI Impact Summary

1.23 Appendix 1 – Rational for the relatively high rates of sewer flooding in the United Utilities region

As described in section 1.18 above we believe that our relative performance versus upper quartile is due to a unique combination of factors that only impact the North West including; high rainfall, high proportion of old combined and Section 24 sewers and high population density, all combined with large numbers of cellared properties, resulting in increased levels of sewer flooding in our region.

To test this 'belief' we identified a number of factors that could explain the high levels of sewer flooding in the North West. We applied two 'tests' to the identified factors:

Test 1: Can we show that in relation to the factors identified we are substantially different from the majority of the other companies

Test 2: Can we demonstrate that the scale of the factor(s) is directly related to high levels of sewer flooding in the United Utilities region

Applying these tests (and engineering judgement) we identified three 'special factors' that we believe partially account for the difference in the levels of sewer flooding between the North West and other areas of the country. These 'special factors' are:

- Amount and intensity of rainfall
- Sewer type and age
- Property type and density

The figure below provides a ranked summary of the three special factors together with the sub-factors that have been used to quantify each special factor. For each sub-factor, companies that are significantly different from the average are highlighted. This clearly shows that, uniquely, for each of the sub-factors the United Utilities region is significantly different from the average. Flooding numbers are based on properties flooding per annum due to both other causes and hydraulic overload using data from the 2013-14 Regulatory Return and the Ofwat Draft Determination upper quartile analysis.

Company		Anglian	Dwr Cymru	North-umbrian	Severn Trent	Southern	South West	Thames	United Utilities	Wessex	Yorkshire
Internal flooding	FY14 properties pa	1	3	8	4	7	6	5	9	2	10
Special factors	sub-factors										
Rainfall	Rainfall amount	1	10	6	3	4	9	2	8	7	5
	Rainfall intensity	1	10	2	3	6	9	4	8	6	5
Sewer type and age	% Combined sewers	1	6	8	4	3	10	2	7	5	9
	% S24 sewers	2	4	1	8	5	3	10	7	6	9
	% sewers older than 1941	3	5	1	6	2	4	9	7		8
Property type and density	Population density	3	2	5	8	5	1	10	9	4	7
	Properties with cellars	2	7	8	1	3	6	5	10	4	9

Figure 60 - Ranked summary of special factors

The evidence behind the identification of the three sub-factors is given below.

Special factor 1: High levels of rainfall (both total amount and intensity) is directly related to levels of sewer flooding

Test 1: Can we show that in relation to the factors identified we are substantially different from the majority of the other companies.

The United Utilities region experiences both a greater amount, and higher intensity, of rainfall than the majority of other companies. This is clearly shown in the two graphs for annual rainfall and rainfall intensity (data from Met Office for 1971 to 2000) given below.

These graphs demonstrate that United Utilities is substantially different from the majority of other companies (average shown as horizontal line) with respect to rainfall and therefore this test is 'passed'.

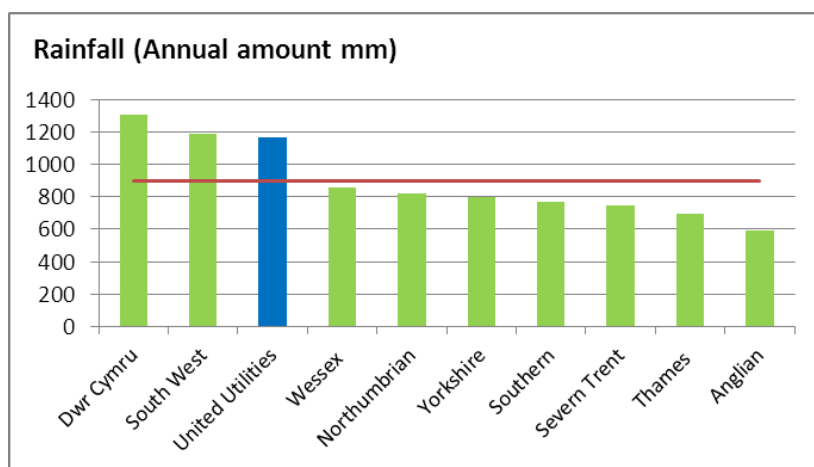


Figure 61 - annual rainfall for 1971 to 2000

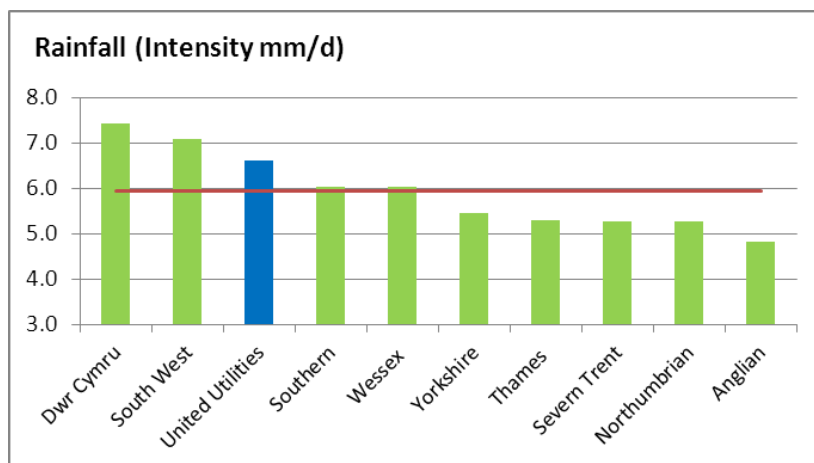


Figure 62 - rainfall intensity for 1971 to 2000

For high levels of sewer flooding to occur rain must fall on areas of high population density (which are likely to be urban areas with sewerage systems). High levels of rainfall in rural areas, without extensive sewerage collection systems, will drain to ground or local watercourses without resulting in sewer flooding. The North West is unique in experiencing both high rainfall (total amount and intensity) and high population density (large urban areas). See population density graph shown below.

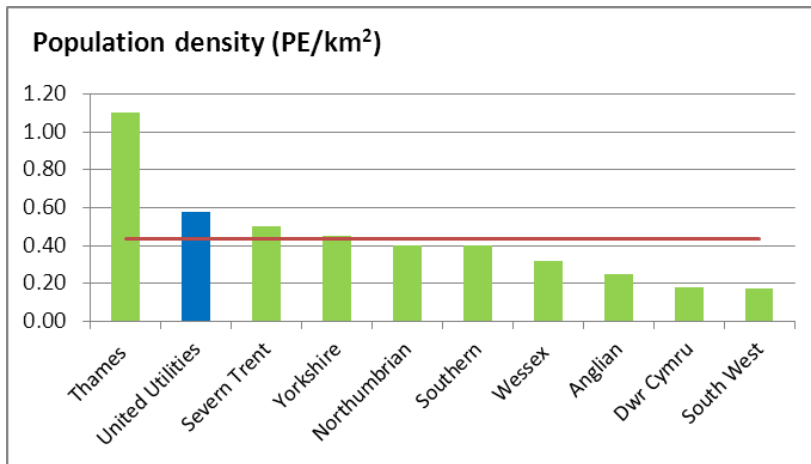


Figure 63 - population density

Whilst Welsh Water and South West Water experience high levels of rainfall, this typically falls on areas of low population density (rural areas) and therefore does not make a significant contribution to sewer flooding. The Thames Water area has a very high population density but relatively low levels of rainfall.

Test 2: Can we link the scale of the factor(s) with high levels of sewer flooding in the United Utilities region.

The graph below plots rainfall intensity against number of internal sewer flooding incidents. This clearly demonstrates, as would be expected, that higher levels of rainfall result in increased levels of sewer flooding.

The scale of the factor (in this case rainfall) is directly linked with increased levels of sewer flooding in the North West and therefore this test is 'passed'.

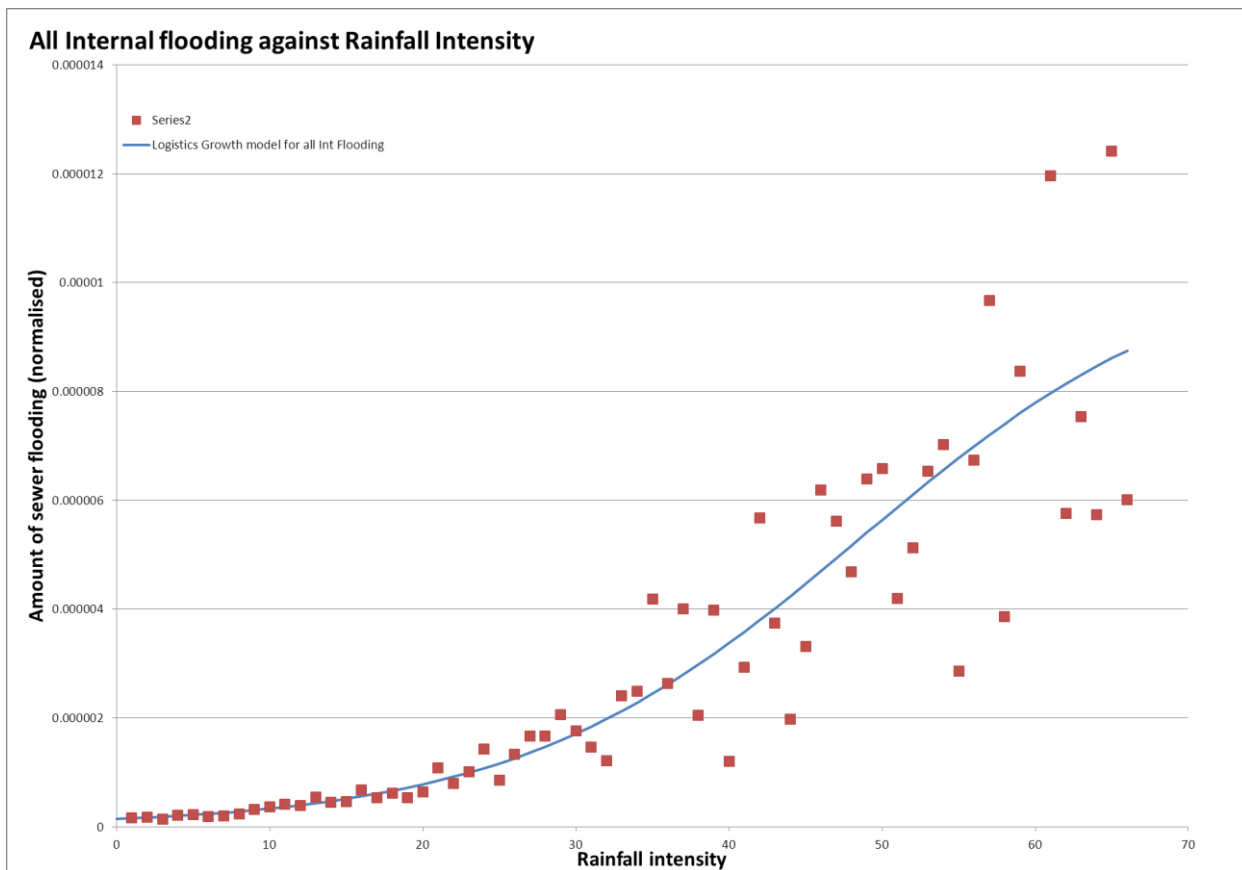


Figure 64 - All internal flooding against rainfall intensity

Special factor 2: Sewer type and age is directly related to levels of sewer flooding

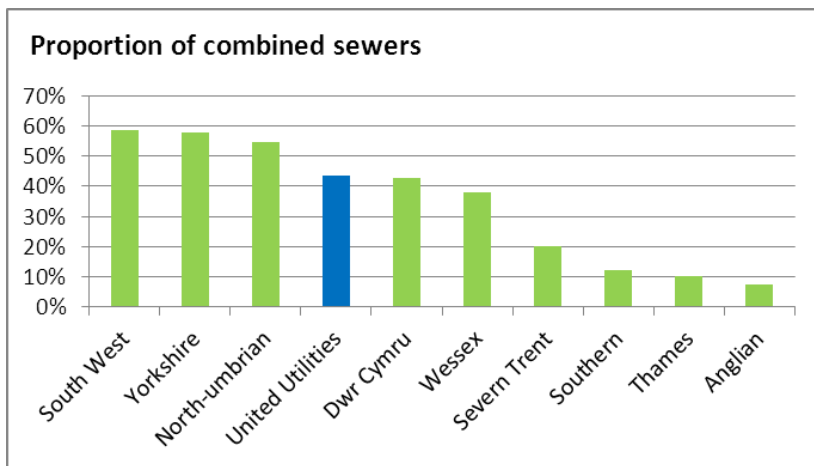
Test 1: Can we show that in relation to the factors identified we are substantially different from the majority of the other companies.

The United Utilities region has a greater proportion of combined and Section 24 sewers, and has older sewers, than the majority of other companies.

Combined sewers take both foul and surface water (rain) flows. They are typically larger than separate systems and therefore experience large fluctuations in flow. The variable flows in combined sewers can result in both the formation of blockages (resulting from low flows in large diameter sewers), and hydraulic overload resulting from periods of heavy rain. Both blockages and hydraulic incapacity are major causes of sewer flooding. Section 24 sewers typically connect groups of properties to the larger sewer in the road and therefore tend to be of significantly smaller diameter than hence more prone to blockages than other sewers. Older sewers may have more defects again allowing formation of blockages resulting in flooding.

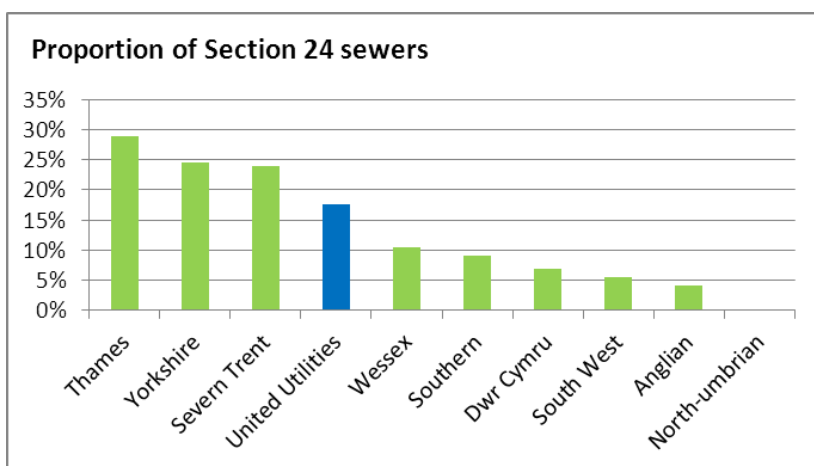
The three graphs shown below give the proportion of combined sewers, proportion of Section 24 sewers and proportion of sewers older than 1940 (data from 2005 June Return datashare and PR09 Asset Inventory datashare).

These graphs demonstrate that United Utilities is substantially different from the majority of other companies with respect to sewer type and age and therefore this test is 'passed'.



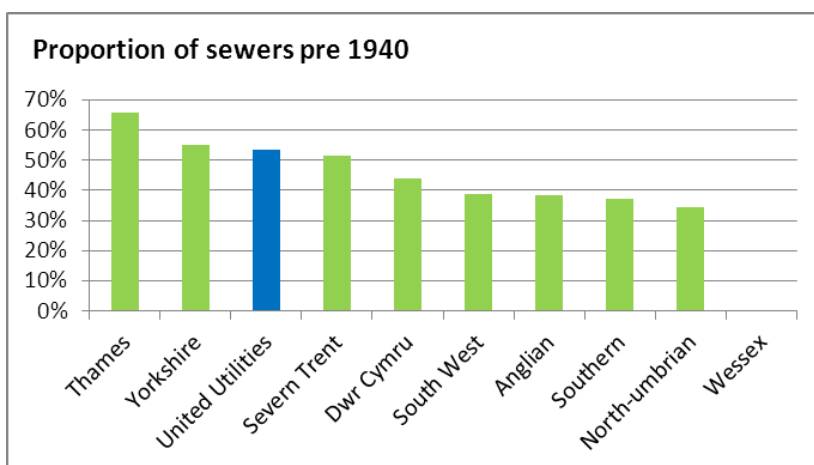
Combined sewers experience variable flows resulting in blockages or hydraulic overload causing flooding.

Figure 65 - Proportion of combined sewers



Section 24 sewers are typically narrow resulting in blockages and flooding.

Figure 66 - Proportion of Section 24 sewers



Older sewers are likely to have more defects resulting in blockages and flooding.

Figure 67 - Proportion of sewers pre 1940

Test 2: Can we link the scale of the factor(s) with high levels of sewer flooding in the United Utilities region

The figure below shows the proportion (normalised by sewer length) of sewer flooding in the United Utilities region attributable to sewers of different type and age. This data is taken from our wastewater incident recording system (WIRS) linked to our sewer records. This table clearly

demonstrates that combined sewers are responsible for more flooding than either foul only or surface water only sewers. The engineering rationale for this was provided above. The table also shows that more flooding occurs from Section 24 sewers and also sewers that are older than 1940, again the engineering rationale for this was given above.

Sewer type (1)	Combined	SW only	Foul only
	45%	22%	33%
Sewer type (2)	Section 24	Non-Section 24	
	78%	22%	
Sewer Age	Pre 1941	Post 1941	
	75%	25%	

Figure 68 - proportion (normalised by sewer length) of sewer flooding in the United Utilities region attributable to sewers of different type and age

The scale of the factor (in this case sewer type and age) is directly linked with increased levels of sewer flooding in the North West and therefore this test is ‘passed’.

Special factor 3: Property type and density is directly related to levels of sewer flooding

Test 1: Can we show that in relation to the factors identified we are substantially different from the majority of the other companies.

We do not have information on the proportion of cellared properties in each company region. Therefore we have used property type as a surrogate, with the expectation that terraced properties are more likely to be constructed in Victorian times and therefore are much more likely to have cellars than semi-detached or detached properties.

The figure below shows the proportion of terraced properties in each water company region (data source 2011 UK Census). This clearly shows that the United Utilities region has more terraced properties (and hence we assume cellared properties) than the other companies.

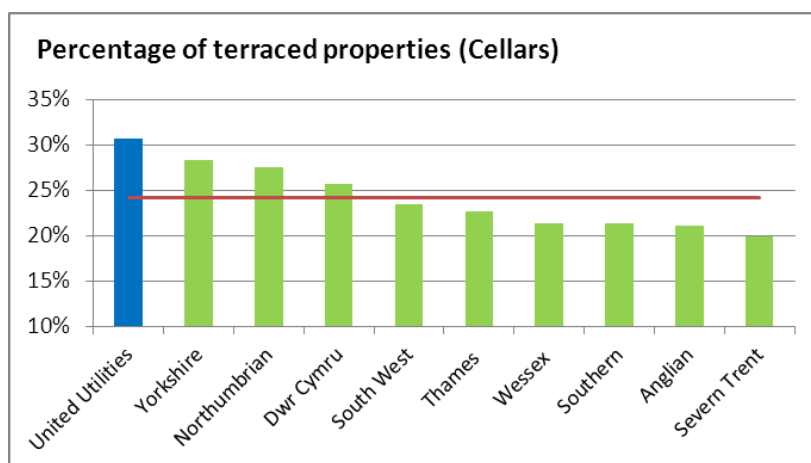


Figure 69 - proportion of terraced properties by water company region

In addition to having more terraced properties (and hence cellared properties) than the other companies, the population density (see figure below showing Population Equivalent (PE) in proportion to area of sewer district from JR11 datashare) in the United Utilities region is one of the highest in the country. This factor is linked to the high proportion of terraced properties in the North

West and exacerbates the impact of high levels of rainfall on sewer flooding as discussed in the rainfall special factor section above.

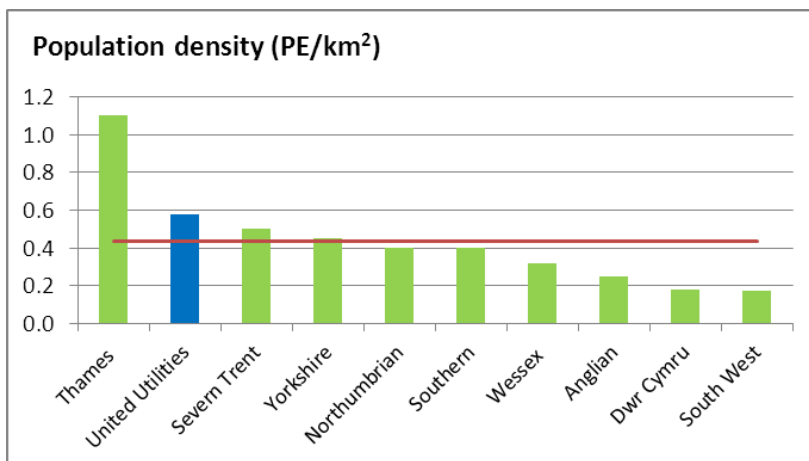


Figure 70 - Population Equivalent in proportion to area of sewer district

The above graphs on terraced properties and population density demonstrate that United Utilities is substantially different from the majority of other companies with respect to sewer type and age and therefore this test is ‘passed’.

Test 2: Can we link the scale of the factor(s) with high levels of sewer flooding in the United Utilities region.

The connection between the public sewer and the cellar drain will occur at a lower level (typically by around two meters) than the main connection into the ground floor of the property. This will result in a greater likelihood of sewer flooding in cellared, compared to non-cellared, properties.

In the UU region around 75% of sewer flooding is associated with properties with cellars. This is based on data from our wastewater incident reporting system (WIRS) which records both the flooding incident and the location of the flooding in the affected property.

The scale of the factor (in this case cellared properties) is directly linked with increased levels of sewer flooding in the North West and therefore this test is ‘passed’.

The link between the three ‘special factors’ described above and upper quartile performance

In the above sections on the three special factors we have separately demonstrated that; rainfall impacts flooding and that United Utilities is substantially different from average; that sewer type and age impacts flooding and United Utilities is substantially different from average, and that property type and density impacts flooding and again United Utilities is different to the average.

However, it is likely that the impact of the three ‘special factors’ on levels of sewers flooding is highly interconnected. For example, for sewer flooding to occur requires high levels of rainfall in areas of high urban density, which in turn will be exacerbated by the high number of cellared properties in the North West which are connected to old combined and Section 24 sewers.

Given the interconnected nature of the three special factors (and seven sub-factors) we have combined these into one explanatory variable. For each of the seven sub-factors we ranked the data by assigning a value of 0% to the lowest and 100% to the highest. We then combined these ranked percentage values into a single value (for each company) by weighting each of the sub-factor to ensure that each of the three special factors had equal weighting in the combined explanatory variable.

We plotted (see linear regression graph below) the combined explanatory variable against the number of properties suffering internal sewer flooding (normalised by connected population) to determine the relationship between the explanatory variable and flooding numbers.

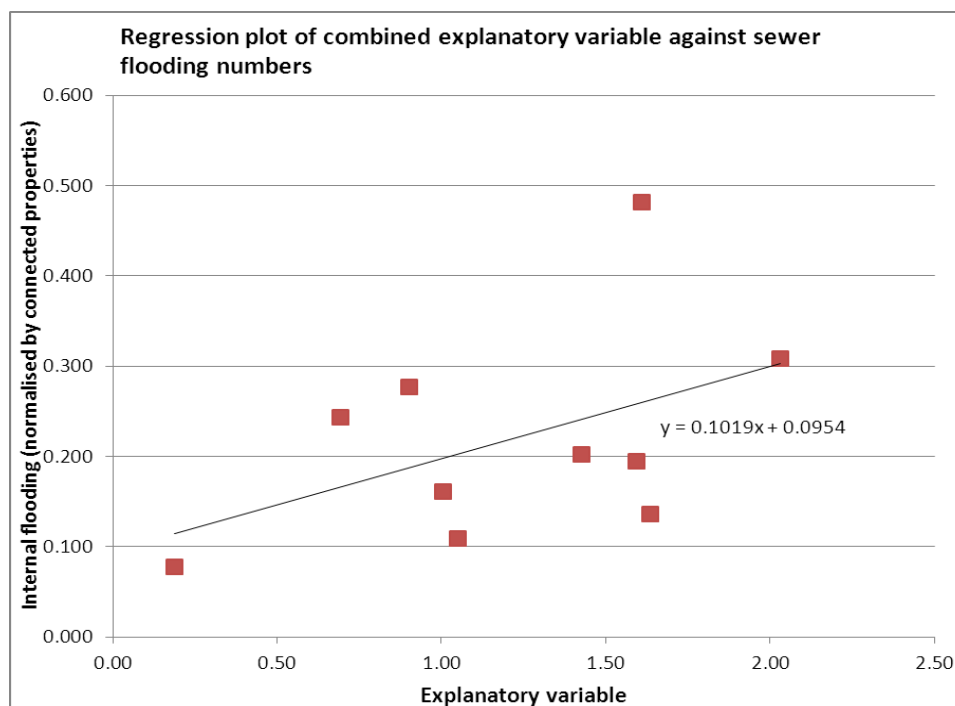


Figure 71 - Regression plot of combined explanatory variable against the number of properties suffering internal sewer flooding

We have then assessed the modelled performance (using the regression equation) and by calculating the difference between actual and modelled performance derived upper quartile performance. To do this we took the fitted data, calculated the residuals and took the upper quartile of the residuals. The upper quartile target for each company was then estimated as the fitted value plus upper quartile.

Based on the above analysis which takes into consideration the impact of the 'company specific risk factors' on sewer flooding performance we calculate that **a more representative upper quartile performance figure for United Utilities would be 693 properties** (net of severe weather) suffering internal flooding per annum. This compares with our 2013-14 actual performance of 940 properties, the Ofwat upper quartile assessment of 391 properties and our 2019-20 target of 525 properties flooding per annum.

We have also cross checked this conclusion by undertaking an alternate approach to modelling the data using a statistical multiple regression model to explain the variation in internal flooding between companies. The model was fitted using the Backward Elimination approach to Stepwise Regression.

To determine the upper quartile position we took the fitted data, calculated the residuals and took the upper quartile of the residuals. The upper quartile target for each company was then estimated as the fitted value plus upper quartile. **The upper quartile performance figure for United Utilities using this 'multiple regression' method was calculated as 916 properties pa.**

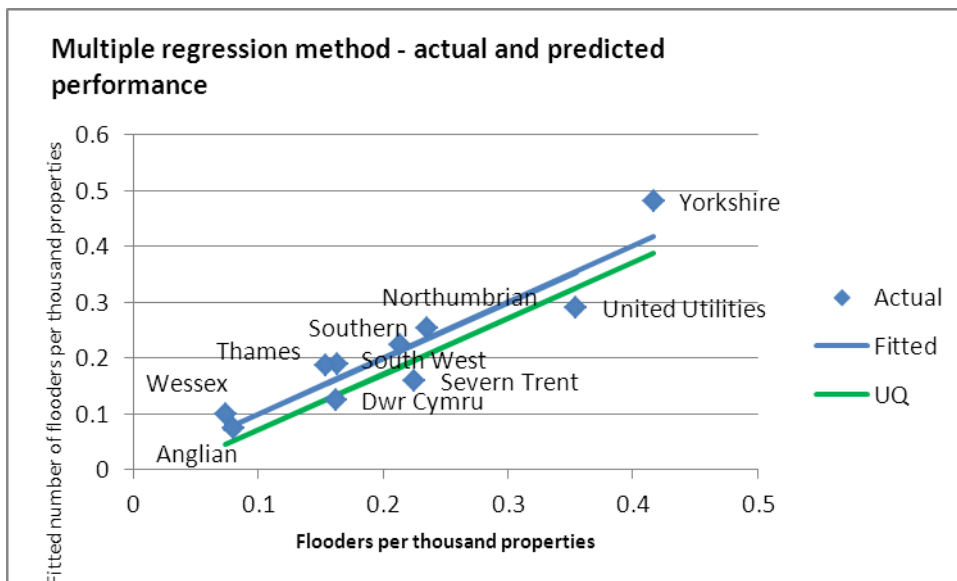


Figure 72 - Multiple regression method - actual and predicted performance

Whilst we have developed what we believe is a credible model which provides a partial explanation for the high levels of flooding in the North West. We are not suggesting that our model is perfect, or that our AMP6 target should be re-set at 693 (or indeed 916) properties pa.

Rather we have sought to demonstrate that company performance is dependent on many regional factors outside of management control, and therefore the calculation of upper quartile performance based on just a comparison of recorded performance is simplistic. Therefore we continue to believe that our June plan internal flooding target of reducing internal sewer flooding to 525 properties pa by 2019-20 remains a credible but challenging target considering the uniquely difficult (in relation to sewer flooding) operating conditions in the North West. Therefore we strongly believe that our AMP6 performance commitment for sewer flooding should be not re-set at the level imposed in the Draft Determination, but should remain as our June plan.

1.24 Appendix 2 – Minor amendments and corrections to the Ofwat Draft Determination Annex 4 ‘Outcomes, performance commitments and outcome delivery incentives’ template

In appendix 2 we have included minor revisions to the ODI templates for the following measures:

- Performance commitment S-A2: Wastewater network performance index
- Performance commitment S-C1: Contribution to bathing waters improved
- Performance commitment S-D5: Satisfactory Sludge Disposal

In the text below we have corrected minor errors in the Draft Determination template and/or simplified the definition of the measure and additional details section.

1.24.1 Performance commitment S-A2: Wastewater network performance index

Detailed definition of performance measure

This performance commitment provides information on how well the sewerage system is being maintained, excluding the transferred assets. It provides an assessment of the condition and performance of sewers, rising mains, pumping stations, combined sewer overflows and detention tanks. It includes the three asset performance indicators from the AMP5 sewerage infrastructure serviceability assessment (collapses, blockages and equipment failures)

Incentive type: Financial – penalty only

Performance commitments

		Starting level	Committed performance levels				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	Index	108.4	106.2	103.2	99.4	95.6	93.4
Penalty collar	Index		115.4	112.4	108.6	104.8	102.6
Penalty deadband	Index		108.9	105.8	101.9	98.0	95.7

Figure 73 - Extract from Ofwat DD Annex 4 page 134 - Performance Commitments

Incentive rates

Incentive type	Performance levels (index points)		Incentive rate (£m/index point/year)
	Lower	Upper	
Penalty	95.7	115.4	2.315

Figure 74 - Extract from Ofwat DD Annex 4 page 134 - Incentive Rates

Additional details (if changed from Draft Determination)

Necessary detail on measurement units	<p>The number of blockages, collapses, rising main bursts and equipment failures is produced using the same approach as that used historically to complete the June Return Table 16a.</p> <p>This measure does not include incidents from the assets transferred in October 2011 or October 2016. This is to differentiate between incidents from the legacy assets which are included in the scope of this measure, and incidents from transferred assets which are included in the private sewers service index.</p> <p>The performance commitment is calculated as a weighted score and is produced by multiplying the number of blockages, collapses, rising main bursts and equipment failures by the relevant willingness to pay valuations. The weighted score is then scaled so that '100' represents the actual 2013/14 performance and '0' represents zero service failures.</p> <p>The performance commitment is therefore the scaled weighted score, allowing some flexibility within the sub-measures.</p>
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Figure 75 - Extract from Ofwat DD Annex 4 page 134 - Additional Details

1.24.2 Performance commitment S-C1: Contribution to bathing waters improved

Detailed definition of performance measure

This performance commitment identifies the contribution which will be made in improving bathing waters and shellfish waters through delivery of the schemes agreed with the Environment Agency. The impact of each scheme has been converted into a "bathing water equivalent" (BWE) based on; the number of bathing/shellfish waters improved by the scheme, the scale of the impact the scheme will make on the bathing water/shellfish waters, and the scale of the costs involved in implementing the scheme. The measure will be reported cumulatively across AMP6.

Incentive type: Financial – penalty only

Performance commitments

	Unit	Starting level	Committed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	BWE	0.00	0.36	0.66	1.49	3.78	6.56
Penalty collar	BWE		0.00	0.00	0.00	0.00	0.00
Penalty deadband	BWE		0.36	0.66	1.49	3.78	6.56

Figure 76 - Extract from Ofwat DD Annex 4 page 140 - Performance Commitments

Incentive rates

Incentive type	Performance levels (BWE cumulative)		Incentive rate (£m/BWE/year)
	Lower	Upper	
Penalty	0.00	6.56	3.974

Figure 77 - Extract from Ofwat DD Annex 4 page 140 - Incentive Rates

Additional details (if changed from the DD)

Necessary detail on measurement units	<p>The schemes required to be delivered under rB1, rB2, rB5, S1, S2 and S8 drivers have been identified from the National Environment Programme. The bathing water equivalent for each scheme was calculated using source apportionment analysis and assigned to the year in which the scheme will be completed. As the schemes that contribute to this PC are completed an ‘output in use’ document is produced which enables both United Utilities Water and the Environment Agency to formally agree that the output is complete.</p> <p>To calculate the PC, the number of bathing water equivalents associated with the schemes that have been formally confirmed as complete in the year will be summed. Changes to the programme will be managed through the United Utilities Water/Environment Agency exchange mechanism. The agreed programme, with any agreed amendments, will be jointly signed off with the Environment Agency.</p>
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Figure 78 - Extract from Ofwat DD Annex 4 page 140 - Additional Details

1.24.3 Performance commitment S-D5: Satisfactory Sludge Disposal

Detailed definition of performance measure

This performance commitment is focussed on compliance relating to sludge treatment and disposal activities to ensure that the environment is protected, as required in law, and adhering with best practice. The measure has been used for a number of years to track performance and has recently been updated to include compliance with the Safe Sludge Matrix. Using The measure assists with maintaining the confidence of stakeholders and the agricultural sector, protecting and promoting the company’s sludge recycling activities.

Incentive type: Financial – penalty only

Performance commitments

	Unit	Starting level	Committed performance levels				
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	%	100	100	100	100	100	100
Penalty collar	%		96.72	96.72	96.72	96.72	96.72

Penalty deadband	%	99.85	99.85	99.85	99.85	99.85
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Figure 79 - Extract from Ofwat DD Annex 4 pages 152 & 153 - Performance Commitments

Incentive rates

Incentive type	Performance levels (% satisfactory sludge)		Incentive rate (£m/percent/year)
	Lower	Upper	
Penalty	96.72	99.85	5.107

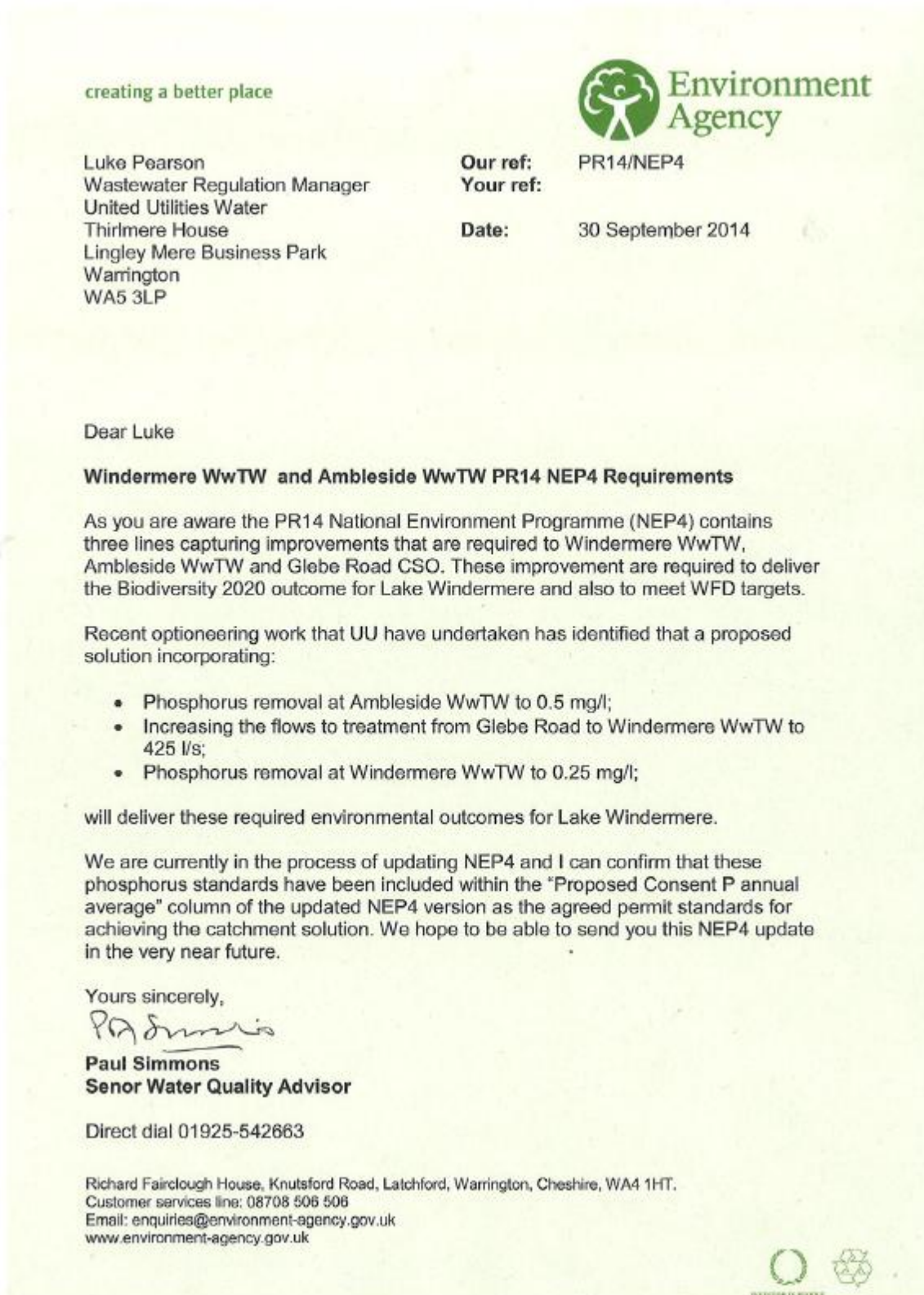
Figure 80 - Extract from Ofwat DD Annex 4 pages 152 & 153 - Incentive Rates

Additional details (if changed from Draft Determination)

Necessary detail on measurement units	<p>The performance commitment is calculated as the percentage of the total sewage sludge disposed of which cannot be confirmed as complying with the Sludge Use in Agriculture Regulations, Safe Sludge Matrix and Environmental Permit Regulations (for sludge incineration and grit and screenings disposal).</p> <p>Percentage satisfactory sludge disposal = $100 - (100 * (A-B)/C)$</p> <ul style="list-style-type: none"> • Where A is the total treated sludge measured in tonnes dry solids plus grit and screenings • B is the total treated sludge measured in tonnes dry solids which cannot be confirmed as complying with the Safe Sludge Matrix, SUIA regulations and EPR • C is the total sludge produced plus grit and screenings measured in tonnes of dry solids <p>The sludge compliance data will be collected using a methodology consistent with that used historically for annual Regulatory Reporting submission. The methodology will provide a detailed description of the process for compiling the data and will set out the systems, reports and data sources used in producing that data.</p>
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Figure 81 - Extract from Ofwat DD Annex 4 pages 152 & 153 - Additional Details

1.25 Appendix 3 – Letter from Environment Agency confirming the Windermere scheme



5. Annex D Retail Outcomes

None of our proposed measures were adjusted in the Draft Determination.

1.26 Proposal for ODI for new IT costs for Retail Household

1.26.1 Ofwat’s Draft Determination

In our Retail Household plan we proposed to invest £43m over the AMP6 period to deliver enhanced customer service and support reductions to cost to serve. As part of the Draft Determination challenge to this expenditure, Ofwat asked for further evidence to demonstrate that customers would be protected in the event of non delivery of this programme of work.

1.26.2 Our response – additional customer protection through additional ODI

Description

In our retail household plan we proposed to invest £43m over the AMP6 period to implement a programme of IT driven enhancement projects which would both enhance customer service and reduce cost to serve.

We are proposing this new measure, which is designed to protect customers from non-delivery of our proposed capital investment programme by monitoring spend against the transformation programme. The progress and milestones of the transformation programme will also be reported to the “Your Voice” customer panel.

Rationale and calculation

Under the Cost to serve methodology we will recover the forecast depreciation on this expenditure based on the projected spend in the Retail Household Business Plan.

This ODI would protect customers by returning any excess depreciation back to customers, if the outturn scope or costs of the programme are lower than assumed in our Business Plan.

The baseline proposed depreciation forms the annual target for each year.

Expenditure (£m)	2015-16	2016-17	2017-18	2018-19	2019-20
Total depreciation of assets principally used by retail that are not included in the RCV (AMP6 or later assets)	1.053	2.317	3.026	4.464	6.909

Figure 82 - Forecast depreciation (Table R3, line 3)

The depreciation is calculated on an annual basis at year end based on the spend in that year. Efficiencies as a result of delivering this transformation programme as a single programme of work have been built into these costs. Therefore, this ODI relates to the total investment level and not to individual project level expenditure.

1.26.3 Expectations of the final determination

We propose that a new performance commitment based on the cumulative depreciation for the billing system developments is considered. This is a penalty only performance commitment and as the measure assesses the cumulative depreciation, the penalty would relate to the final year of the plan.

		Starting level	Committed performance levels (cumulative depreciation)				
	Unit	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
PC	£ cum dep	0	1.053	3.37	6.396	10.86	17.769
Penalty collar	£ cum dep		1.053	3.37	6.396	10.86	0
Penalty deadband	£ cum dep		1.053	3.37	6.396	10.86	17.769
Reward deadband	£ cum dep		na	na	na	na	na
Reward cap	£ cum dep		na	na	na	na	na

Figure 83 - cumulative depreciation for billing system developments - Performance Commitments

Incentive rates

Incentive type	Performance levels (£m cumulative depreciation)		Incentive rate (£m/£m)
	Lower	Upper	
Penalty	0	17.769	1
Reward	na	na	na

Figure 84 - cumulative depreciation for billing system developments - Incentive Rates

Additional details

Necessary detail on measurement units	The calculation of the performance measure is the cumulative depreciation charge for the customer experience programme. This will be reported on an annual basis but the penalties will only be applied in the final year of AMP6.
Frequency of PC measurement and any use of averaging.	This performance measure will be reported on an annual basis but the penalties will only be applied in the final year of AMP6. The measure is cumulative over the AMP.
Timing and frequency of the rewards/penalties	The penalties will be calculated in the final year of AMP6 only.
Form of penalty	Any penalty would be applied as a revenue adjustment to the AMP7 year 1 Retail Household cost to serve allowance.
Any other information or clarifications relevant to correct application of incentive.	We consider that customers are adequately protected against non delivery of this programme through SIM, the net beneficial impact of the programme on United Utilities cost to serve and through the reputational incentives of reporting progress against this programme to the "YourVoice" customer panel.

Figure 85 - cumulative depreciation for billing system developments - Additional Details

1.26.4 Impact on P90, P50 and P10 Analysis

The impact of the ODI proposed change is:

£m	Maximum penalty	P10	Central estimate of impact	P90	Maximum reward
We Propose	-17.769	-0	0	0	0

Figure 86 - ODI Impact Summary