

December 2019

# PR19 final determinations

**Southern Water – Cost efficiency  
final determination appendix**

## **PR19 final determinations: Southern Water – Cost efficiency final determination appendix**

## About this document

This document is a cost efficiency appendix to 'PR19 final determinations: Southern Water final determination'. This document provides further details of the company specific issues related to cost allowances and is structured as follows:

- Section 1 provides a summary of our decisions on the company's cost adjustment claims;
- Section 2 provides a summary of our decisions on the company's enhancement proposals, by enhancement area;
- Section 3 provides our decision on costs proposed by the company under the transition programme;
- Section 4 provides our decision on unit cost adjustments related to the WINEP uncertainty mechanism.

Further information on our assessment and our approach can be found in the 'Securing cost efficiency technical appendix' and the various excel feeder models that we have published.

Amendment	Date
<p>Section 4 Pages 10 – 13 Amendments made to text and Table 5</p> <ul style="list-style-type: none"> <li>• New 2nd paragraph commencing “Southern Water’s WINEP includes a number of obligations...”</li> <li>• Additions to 3rd paragraph commencing “Table 5 sets out the adjustments...”</li> <li>• Formula in right hand column of Table 5 amended from <math>(0.001341A + 3.0723) \times 0.9736</math> to <math>2.778 + 0.001213A</math></li> <li>• Formula in right hand column of Table 5 amended from <math>3.725 + 0.6255A + 0.0097B + 0.5145e^{(0.9326+0.6681 \times \ln(A)+0.1468 \times \ln(B))}</math> to <math>0.61327A + 0.009564B + 1.28168A^{0.6681}B^{0.14683}</math></li> <li>• Formula in right hand column of Table 5 amended from <math>111.883 \times ((e^{(0.8712 \times \ln(A)-5.2075)}) / 407.434 + (e^{(0.7872 \times \ln(A)+0.1914 \times \ln(B)-5.054)}) / 134.533)</math> to <math>0.0012432A^{0.87119} + 0.0043895A^{0.78719}B^{0.19137}</math></li> <li>• Formula in right hand column of Table 5 amended from <math>26.074 + 0.1202A + 0.6762B + 1.5877C</math> to <math>0.125605A + 0.706748B + 1.65945C</math></li> <li>• Definition of variable C in right hand column of Table 5 amended from “the no. of STWs being enhanced where the proposed P consent limit is &lt;0.5mg/l” to “...consent limit is &lt;=0.5mg/l”</li> <li>• Formula in right hand column of Table 5 amended from <math>0.0125A + 0.00150B</math> to <math>0.01165A + 0.0014B</math></li> </ul>	26 October 2020

<ul style="list-style-type: none"><li>• Redundant units in right hand column of Table 5 deleted so that £2.244m becomes 2.244, £0.114m becomes 0.114, £1.166m becomes 1.166 (two instances), £0.098m becomes 0.098, £0.110m becomes 0.110 and £0.073m becomes 0.073</li><li>• In Table 5 Bewl-Darwell Transfer – Southern Water (Unique ID 7SO200025) is listed under the new sub-heading “WINEP/NEP ~ Invasive non-native species</li><li>• Additions to footnote 1 to Table 5</li><li>• New 2nd footnote to Table 5</li></ul>	
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## 1. Cost adjustment claims

Table 1 summarises our consideration and allowances for the cost adjustment claims submitted by the company. For completion we include all claims that were part of our draft determination decisions, as well as additional or revised claims the company submitted in its representation to the draft determination. We give further details in our published cost adjustment claim feeder model for Southern Water.

**Table 1: Cost adjustment claims and our allowed totex adjustments, 2020-25 (£ million of 2017-18)**

Description of Claim	Value of company claim	Our allowed adjustment	Rationale for decision
Thanet groundwater protection	32.9	30.0	Southern Water requests additional expenditure for an atypically large multi-period groundwater protection scheme. At the draft determination we made a partial allowance following further evidence from the company on the efficiency of the cost and details of the cost breakdown, but made a deduction for the implicit allowance. The company accepts our draft determination allowance and makes no further representation.
Improving bathing waters beyond statutory requirements	21.3	20.6	Southern Water claims additional expenditure for its continued initiative of improving bathing water quality beyond the statutory minimum. At draft determination we accepted the need for investment, but made a disallowance for the cost of remediating misconnections which we consider to be base expenditure. The company accepts our draft determination allowance and makes no further representation.

## 2. Enhancement assessments

Our approach to assessing enhancement expenditure is detailed in our publication 'Securing cost efficiency technical appendix'. We generally assess enhancement expenditure separately for each enhancement category, as defined by the individual enhancement cost lines in company business plan tables. We assess multiple lines together where there is a potential for costs to be apportioned differently by companies and where there is some synergy between programmes.

Our preferred method of assessment is benchmarking analysis. Where the investment area does not lend itself to statistical modelling we rely more on the evidence provided by companies in their business plans. We follow a risk-based process of having a lighter touch ('shallow dive') assessment for low materiality costs and a more thorough assessment of the evidence ('deep dive') of high materiality costs.

Tables 2 and 3 summarise our consideration and allowances for the enhancement expenditure cost lines submitted by the company. We give further details in our published enhancement feeder models for Southern Water.

**Table 2: Assessments of water enhancement expenditure, 2020-25 (£ million of 2017-18)**

Enhancement cost	Company view in August 2019 business plan (after reallocations)	Our final determination allowance	Rationale for decision
Meeting lead standards	19.8	19.8	We use a benchmark model to make allowances for these costs. Southern Water is more efficient than our benchmarks and we allow the full amount requested. In its business plan, the company proposes trials for replacing customers' supply pipes. We support the company's approach, recognising its aspiration to minimise lead in customers' water.

Supply and demand side enhancements: Total	219.0	173.6	<p>We do not allow enhancement costs for leakage reduction, because the company's stretching performance commitment level does not go beyond the forecast upper quartile threshold.</p> <p>We allow the request within the 2020-25 supply-demand balance enhancement component in full because the unit cost is lower than the efficient industry benchmark. We undertake a deep dive assessment and challenge the cost efficiency of the long term supply-demand balance and internal interconnections components of this investment.</p> <p>See 'Southern Water final determination' for further information.</p>
Investment to address raw water deterioration	75.3	60.4	<p>We use our deep dive approach and allow in full the capex investment for the schemes at treatment works and the operational catchment schemes. We consider that the operating costs for the enhanced treatment works are covered by our base allowance. See 'Southern Water final determination' for further information.</p>
Metering (excluding new connections) for meters requested by optants, customers and businesses	10.7	10.4	<p>As at draft determination we make an allowance for metering based on our unit cost model. At final determination we apply the frontier shift to the model output which results in a minor reduction in the allowance.</p>
Security	1.0	0.0	<p>We apply a shallow dive approach to these costs. The company has spent above average on security so we do not allow the requested cost in our final determination. We consider that future costs should form part of the company's 'business as usual' programme of work and are covered by our base allowance.</p>
Total clean water WINEP	17.5	17.1	<p>We use our shallow dive approach to set allowances, applying the company specific efficiency challenge only, for water framework directive measures. We use our deep dive approach to challenge investment associated with invasive non-native species and find insufficient evidence of solution pioneering and efficient costs. We apply an pioneering challenge and the deep dive company specific efficiency challenge.</p> <p>We use our deep dive approach and challenge the cost efficiency of investment associated with environmental investigations.</p>
Aggregated free form lines	91.4	6.9	<p>We use a deep dive approach to challenge the £9.3 million request for reservoir safety enhancement work at four named reservoirs. We consider the evidence provided by the company is insufficient to demonstrate robust and efficient of the costs, and sufficient</p>

			<p>optioneering. Therefore we apply a 20% optioneering challenge and the company specific efficiency challenge to make our £6.9 million allowance.</p> <p>The company requests £84.9 million to develop strategic regional water resource solutions and we allow this in full. This allowance is recorded separately to the other enhancement expenditure in our models because it is outside of cost sharing. See 'Southern Water final determination' and the 'Strategic regional water resource solutions appendix' for further information.</p>
<b>Total water enhancement</b>	<b>434.7</b>	<b>288.2</b>	

**Table 3: Assessments of wastewater enhancement expenditure, 2020-25 (£ million of 2017-18)**

<b>Enhancement cost</b>	<b>Company view in August 2019 business plan (after reallocations)</b>	<b>Our final determination allowance</b>	<b>Rationale for decision</b>
First time sewerage (s101A)	5.0	4.9	We use a benchmark model to make allowances for these costs. Southern Water is relatively less efficient than our benchmarks and we do not allow the full amount requested.
Sludge quality and growth	5.0	5.1	Our allowance remains unchanged from the draft determination of £5.06 million that the company accepts in its representation. We note that the total the company includes in its data table is £5.03 million but we do not consider the variance to be material.
Total WINEP/NEP in the round allowance	604.8	536.7	We derive our allowance from the output of cost benchmarking models except where we conducted a shallow or deep dive. Our shallow dive assessments allow the costs in full for programmes relating to chemical investigations and nitrogen removal. We assess the requested costs for UV disinfection using a deep dive assessment and allow the cost in full as the evidence is sufficient. We assess the requested costs for wastewater investigations by a deep dive assessment and apply a cost challenge as there is insufficient evidence that a range of options have been considered. The costs under groundwater schemes are assessed principally using a deep dive approach through our cost adjustment claim process. As we were not able to develop a robust cost benchmarking model for the sanitary parameters model, we allow the costs in full. We subsequently determine our view of efficient costs at a programme level by summing all the allowances for the individual lines and making an adjustment to account for catch-up efficiency and frontier shift. The company's allowance is the lesser of our programme level view and its requested investment. We provide further detail of the assessment approach in the 'Securing cost efficiency technical appendix'.
Aggregated free form lines	31.2	20.6	Southern Water requests £10.7 million associated with meeting its pollution incident common performance commitment levels. We make no allowance at final determination for this request, consistent with our policy described in the 'Securing cost efficiency technical appendix'. The company accepts our draft determination allowance for improving bathing water quality beyond the statutory minimum and we make an allowance of £20.6 million which is unchanged from draft determination.
<b>Total wastewater enhancement</b>	<b>646.1</b>	<b>567.2</b>	

### 3. Transition expenditure

The transition programme allows companies to bring forward planned investment from 2020-25 to 2019-20, where it is efficient to do so and/or to enable the company to meet statutory deadlines early in the next regulatory period. Although the expenditure is incurred in 2019-20, for the purpose of cost performance incentives we consider it as expenditure incurred in the following regulatory period (2020-25).

Table 4 set out our allowances under the transition programme for wholesale water. We allow costs when reasonably justified in order to make efficient use of resources to minimise whole life costs, where it is efficient or in customers' interests to bring forward an investment, or to enable companies to meet early statutory deadlines.

For the avoidance of doubt, a disallowance of a proposed expenditure in Table 4 should not be interpreted as a disallowance of the expenditure from our 2020-25 cost allowance; only as a disallowance under the transition programme.

Southern Water does not request any wastewater expenditure under the transition programme.

**Table 4: Transition expenditure in wholesale water price controls 2019-20 (£ million of 2017-18 CPIH deflated)**

Description of expenditure	Control	Requested expenditure	Allowed expenditure	Rationale
Strategic regional water resource solutions	Water Resources	1.9	1.9	Investment in strategic solutions with early delivery dates to meet in the next price control period.
Strategic regional water resource solutions	Water Network Plus	2.1	2.1	Investment in strategic solutions with early delivery dates to meet in the next price control period.

## 4. WINEP uncertainty mechanism

Our totex allowance for companies includes an allowance for environmental obligations set out in the Water Industry National Environment Programme (WINEP). Some of the requirements in WINEP are not expected to be confirmed until December 2021 at the earliest, which is after we make our final determinations in December 2019. Unconfirmed requirements in WINEP are known as ‘amber’ schemes. Where we make an allowance for amber schemes, we use a mechanism to adjust our totex for schemes which are later confirmed as not required.

Southern Water’s WINEP includes a number of obligations where the requirements were not specified at scheme level and merely noted as being at ‘Water Company Scale’. For these obligations Southern Water’s business plan and the allowance in our final determination are based on measures at asset level that Southern Water has assumed will be required. These measures (or schemes) are also unconfirmed.

Table 5 sets out the adjustments we will make for each scheme / type of scheme in Southern Water’s WINEP programme that is currently unconfirmed, if the scheme is confirmed as not required for the period 2020-25. Conversely, we will use this mechanism to make adjustments if other schemes in the ‘Water Company Scale’ obligation categories but unanticipated by Southern Water and excluded from its business plan (and therefore for which no allowance has been made in our determination) are subsequently confirmed as being required. We will make the adjustments at the end of the control period. Our adjustments are based on the company’s totex estimates (after reallocations) as adjusted by our company specific efficiency factor or, in the case of wastewater schemes, by the ratio of our final totex allowance for the WINEP programme to the company’s estimate (after reallocations).

**Table 5: WINEP uncertainty mechanism – cost adjustments for unconfirmed WINEP schemes included in our final determination (£ million in 2017-18 prices)**

No of lines in WINEP / Unique ID	Scheme category / name	Company’s totex unit rate	Our allowed totex unit rate
WINEP/NEP ~ Storage schemes in the network to reduce spill frequency at CSOs, etc (usually under U_IMP4 driver)			
7SO200191	Programme level	Not specified. Bespoke, deep dive approach proposed.	2.778 + 0.001213A where: A is the cumulative volume of new or additional storage provided (in m <sup>3</sup> )

No of lines in WINEP / Unique ID	Scheme category / name	Company's totex unit rate	Our allowed totex unit rate
WINEP/NEP ~ Schemes to increase flow to full treatment (usually under U_IMP5 driver)			
7SO300448	Programme level (excluding Budds Farm)	Not specified. Southern Water proposes using Ofwat's 'Flow to Full Treatment' model to adjust costs in the event of scheme addition or removal.	0.61327A + 0.009564B + 1.28168A <sup>0.6681</sup> B <sup>0.14683</sup> where: A is no. of STWs being enhanced, and B is the cumulative shortfall in capacity being addressed (in l/s)
	Budds Farm STW	Not specified. Bespoke, deep dive approach proposed.	
WINEP/NEP ~ Storage schemes at STWS to increase storm tank capacity (usually under U_IMP6 driver)			
7SO300449	Programme level	94,142 x A <sup>0.5308</sup> where: A is the cumulative volume of new or additional storage provided (in m <sup>3</sup> )	0.0012432A <sup>0.87119</sup> + 0.0043895A <sup>0.78719</sup> B <sup>0.19137</sup> where: A is the cumulative volume of new or additional storage provided (in m <sup>3</sup> ) and B is the no. of STWs being enhanced
WINEP/NEP ~ UV disinfection (typically under the SW_IMP and SW_ND drivers)			
7SO200202, 7SO200206	Programme level	Not specified. Southern Water proposes using Ofwat's 'UV disinfection' model to adjust costs.	Since we have no unit or regression cost model for these schemes, we use a bespoke, deep dive approach
WINEP/NEP ~ Nutrients (P removal) at ASPs or filter bed STWs			
64 lines	Programme level	Not specified. Southern Water proposes using Ofwat's 'P removal' model to adjust costs.	0.125605A + 0.706748B + 1.65945C where: A is the population equivalent served (in '000) B is the no. of STWs being enhanced, and C is the no. of STWs being enhanced where the proposed P consent limit is <=0.5mg/l
WINEP/NEP ~ Chemicals removal schemes			
7SO300016	Cuckfield WWTW (CIP2 T2)	Not specified. Southern Water proposes using Ofwat's 'Chemicals removal' model to adjust costs.	2.244
WINEP/NEP ~ Investigations (wastewater)			

No of lines in WINEP / Unique ID	Scheme category / name	Company's totex unit rate	Our allowed totex unit rate
7SO200256	Investigation to determine the costs and technical feasibility of reaching or maintaining revised CSMG water quality targets for the Lymington River SSSI.	Not specified. Bespoke, deep dive approach proposed.	0.114
7SO200195, 7SO200196, 7SO200197, 7SO200198, 7SO200201, 7SO200203, 7SO200204, 7SO200190	Southern Water PR19 bathing water / shellfish waters / frequently spilling overflow requirements	Not specified. Bespoke, deep dive approach proposed.	Since we have no unit or regression cost model for these schemes, we use a bespoke, deep dive approach
WINEP/NEP ~ Reduction of sanitary parameters			
7SO200340	Buriton WWTW	Not specified. Southern Water proposes using Ofwat's 'Sanitary parameters' model to adjust costs.	1.166
7SO200409	Chiddingfold WWTW		1.166
WINEP/NEP ~ Investigations (water)			
7SO200246	ANDOVER (ANTON AND PILLHILL BROOK RSA)	Not specified. Bespoke, deep dive approach proposed.	0.098 per scheme
7SO1000193	CARISBROOKE (PLAISH MEADOWS AND LUKELY BROOK RSA)		
7SO1000194	BOWCOMBE (PLAISH MEADOWS AND LUKELY BROOK RSA)		
7SO200272	River Itchen Wetlands	Not specified. Bespoke, deep dive approach proposed.	0.110 per scheme
7SO200274	River Itchen Southern Damselfly investigation/options appraisal		
WINEP/NEP ~ Invasive non-native species			
7SO200025	Bewl-Darwell Transfer - Southern Water	Not specified. Bespoke, deep dive approach proposed.	0.073
WINEP/NEP ~ Event duration monitoring (under BW_MON, SW_MON, U_MON3, U_MON4 drivers)			
7SO200199, 7SO200205, 7SO300450, 7SO300451	Southern Water PR19 bathing water / shellfish water / flow requirements	Not specified. Southern Water proposes using Ofwat's 'EDM' model to adjust costs.	0.01165A + 0.0014B where: A is the number of EDMs installed and B is the number of permit activities carried out

No of lines in WINEP / Unique ID	Scheme category / name	Company's totex unit rate	Our allowed totex unit rate
WINEP/NEP ~ Bathing water requirements not covered by any of above mechanisms (under BW_IMP1, 2, 3, ND drivers)			
7SO200192, 7SO200193, 7SO200194, 7SO200200	Southern Water PR19 bathing water requirements	Not specified. Bespoke, deep dive approach proposed.	Since we have no unit or regression cost model for these schemes, we use a bespoke, deep dive approach

## Notes:

- 1) For the avoidance of doubt, if we need to apply any of the formulae in the 'Our allowed unit totex rate' column, we will apply them at the programme level, not scheme level. This means that the totex recovered for customers at the end of the control period will be the cost produced by a formula when the values for the variables assumed at final determination are used minus the cost produced by the formula when the values for the variables eventually confirmed are used. Given that a number of the requirements in Southern Water's WINEP were not specified at scheme level and the company therefore had to make assumptions in its business plan about the assets needing to be improved, the result of this calculation may be negative. In this case the calculated shortfall in the totex allowance will be recovered from customers at the end of the control period.
- 2) We will assess the efficient costs of any types of measure required under the 'Water Company Scale' obligations that are not addressed in Table 5 using a bespoke, deep dive approach.

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We regulate the water sector in England and Wales.

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