

## Wessex Water Services Ltd Response to Ofwat's PR19 Draft Determination – August 2019

**Representation reference: Cost Assessment C3**

**Representation title: WINEP: Phosphorus removal**

### Summary of issue

We acknowledge the work that Ofwat has done since the IAP to refine its cost assessment enhancement feeder model for phosphorus removal, but remain concerned that the model is not properly representative of the true scope and costs of this work across the water and sewerage companies.

Our AMP7 phosphorus removal programme represents approximately 40% of our wastewater enhancement programme to deliver the requirements of the WINEP. Ofwat's cost assessment from the model provides a totex allowance of £171.889m compared to our business plan estimated totex of £182.834m. This allowance is further reduced by Ofwat's 'WINEP in-the-round' adjustment, bringing the overall reduction down from our plan values to 15% for phosphorus removal. Our representation on this adjustment can be found in C8: WINEP: In the round efficiency challenge.

WINEP: Phosphorus removal (inc. Catchment Nutrient Balancing)	£m
PR19 business plan	182.834
Draft determination	171.889
Representation request	182.834

### Change requested

On the basis of the evidence provided in this representation, we request that Ofwat allow the full costs for phosphorus removal, as submitted in our business plan in September 2018.

More generally, review whether the explanatory factors and associated costs are provided by companies on a consistent basis, i.e. that the proposed business plan costs deliver the outcomes in the explanatory factors table as there is some evidence that these may be misaligned.

### Rationale (including any new evidence)

We acknowledge the work that Ofwat has done to refine the models for use for the draft determination in response to comments from us and other companies. Ofwat has made changes to its phosphorus removal feeder model used for the IAP, in particular regarding the stringency of permit changes.

Our representation covers five main areas:-

- i) Population misallocation
- ii) Cost allowance for operational enhancements
- iii) Ofwat's interpretation of information in WWS2, WWn4 and the WINEP
- iv) Modelling of 'amber' WINEP schemes
- v) Need for improvement at Berry Hill Sludge Treatment Centre

### **i) Population misallocation**

We have identified discrepancies with our population allocations in Data Table WWn4. Where sites had more than one scheme/driver we had apportioned the costs to the relevant capital/operating expenditure lines in Data Tables WWS2 and WWS2a. We had, however, misinterpreted the allocation of population equivalent and only placed the population equivalent against the primary cost driver in Data Table WWn4.

This has resulted in an understatement of population equivalent against line 18 related to Corfe Castle STW of 1,646, for 2020-21. The site's p.e. had originally only been assigned against Line 24 (Current population equivalent served by STWs with tightened/new UV consents). We have updated WWn4 with the above correction.

We have also identified an apparent error in Ofwat's feeder model (FM\_E\_WWW\_p-removal\_ST\_DD.xlsx) for the calculation of p.e. for Severn Trent Water. Cell I57 of tab "Data\_override" (overridden for p.e. served by activated sludge STWs with tightened/new P consents, in 2024-25) refers to Data!J57 rather than Data!I57, i.e. using the p.e. served by filter bed STWs with tightened/new P consents instead. Given the numbers reported by the company in that year, this error has the effect of under-estimating the PE for that company across the five-years.

### **ii) Cost allowance for operational enhancements**

We have worked with the Environment Agency to develop an innovative and sustainable approach for the delivery of phosphorus removal requirements. This involved tightening permit limits on some existing phosphorus removal sites where this can be achieved mainly by operational enhancement and minimal capital investment, to avoid or minimise capital investment elsewhere.

We appreciate that Ofwat has changed its modelling from a capex approach at IAP to totex approach at DD, however we query how opex solutions have been accounted for in its model. The current line definition for WWn4 Line 18 is:

*Population equivalent served by biological filter STWs at which there are new or tightened consent conditions for phosphorus, delivered in the report year and for which capital costs are reported in WWS2 line 19. Exclude population equivalent served where the output has primarily been met through opex rather than capex solutions.*

Given the change in modelling approach, we assume that Ofwat intended to update the line definition to include population equivalent served through opex solutions. As such, we have updated the population equivalents for Line 18 to include opex solutions, as below:

**Table 1: Updated Line 18 in WWn4 Amendments to population equivalents for WWn4 Line 18 (Current population equivalent served by filter bed STWs with tightened/new P consents)**

Line Description		WWn4 April 2019 (2020-2025)	Amendment	Revised WWn4 August 2019 (2020-2025)
18	Current population equivalent served by filter bed STWs with tightened/new P consents	360,350	+ 1,646* + 38,511**	400,507

\* Corfe Castle p.e. originally only assigned against Line 24 (Current population equivalent served by STWs with tightened/new UV consents). Now included against Line 18 for 2020-21.

\*\* Evercreech, Wells and Wellington are opex solutions (with minor enabling capex), so p.e. not previously included

By including the totex but excluding the population equivalent, the cost of these enhancements is not suitably captured in Ofwat's draft determination model. Indeed, as we state on page 19 of "Appendix 4 – Protecting and enhancing the environment: Response to IAP", "Had we not taken this approach, then we would need to include capital investment for asset solutions to achieve tighter permits at other sites." By not making any allowance with its models for operational enhancement, Ofwat's approach risks disincentivising considering opex solutions over capex solutions.

The schemes where we have promoted opex solutions to avoid more stringent permit limits and thus more costly capex solutions elsewhere are summarised below. Details of these sites and solutions can be found in Section 3.2 of Supporting document 5.1 – Protecting and enhancing the environment, as part of our PR19 business plan submission in September 2018.

**Table 2: Population equivalent for phosphorus removal opex solutions at filter bed STWs**

Site	Current P Permit (mg/l)	WINEP3 P Permit (mg/l)	In-AMP Totex (£k)	P.E.	Year
Evercreech STW	1.8	1.0	201	7,688	2022-23
Wells STW	2.0	1.0	251	15,076	2020-21
Wellington STW	2.0	1.0	387	15,747	2020-21
			839	38,511	

Our recommendation is for Ofwat's model to be updated to include population equivalent for operational enhancement schemes as detailed above. If the cost (and population equivalent) of these opex solutions is considered separately, then we recommend a review on the appropriateness of applying an efficiency reduction on this new element through Ofwat's 'WINEP in-the-round' adjustment given the rationale of selecting opex solutions over capex solutions as described above and as detailed in our previous submissions.

### iii) Ofwat's interpretation of information in WWS2, WWn4 and the WINEP

We acknowledge the work that Ofwat has done to refine the models for use for the draft determination in response to comments from us and other companies. Ofwat has made changes to its phosphorus removal feeder model used for the IAP, in particular regarding the number of sites requirement improvement and the stringency of permit changes.

However, we remain concerned regarding Ofwat's interpretation of the source data, as raised in our response to IAP (in particular, page 13 of "Appendix 4 – Protecting and enhancing the environment: Response to IAP"). Whilst we can reconcile the number of sites used in the model with the information contained within data table WWn4, we cannot reconcile this with the WINEP and, in particular, the different approaches that companies have taken to the amber certainty schemes.

Specifically, we have reviewed the data regarding Severn Trent Water. Ofwat's modelled allowance is well above Severn Trent Water's business plan costs after reallocations – £321 million compared to £250 million – and such "efficiency" contributes significantly to making Severn Trent Water an upper quartile company across WINEP as a whole and hence to setting the "WINEP-in-the-round" efficiency challenge factor."

We agree with Ofwat's assessment of their AMP7 phosphorus removal programme from WWn4, that improvements are required at 99 sites, of which 60 have permit changes to  $\leq 0.5\text{mg/l}$ . We cannot, however, reconcile this with the WINEP. Our assessment of phosphorus-related improvement schemes in the WINEP itself for Severn Trent Water is summarised below:

**Table 3: Assessment of Severn Trent Water's phosphorus permit changes in the WINEP**

	Phosphorus Permit Changes in AMP7	
	Total	$\leq 0.5\text{mg/l}$
Green	45*	18
Green + All Amber	155**	73

\* Excludes 2 STWs to be closed (Measham and Packington) and 1 STW with UWWTD conditions applied but no tightening of existing permit as site is already operating to a tighter WFD permit standard (Mansfield).

\*\* In addition to above, excludes a further STW to be closed (Ticknall).

Severn Trent Water has included "green and high-certainty amber schemes" with the remaining "less certain amber projects" covered under their real option mechanism. For phosphorus removal this relates to 78 amber schemes being included with a further 57 excluded but covered under their uncertainty mechanism, as summarised below:

**Table 4: Severn Trent Water's business plan capex for phosphorus removal schemes**

	WWS2 Capex (£m)	'Amber' schemes included in business plan		'Amber' schemes excluded in business plan	
		No. of Schemes	Capex (£m)	No. of Schemes	Capex (£m)
Nutrients (P removal at activated sludge STWs)	102.5	78	74.0	57	43.4

Nutrients (P removal at filter bed STWs)	83.8		77.6		58.0
	<b>186.3</b>		<b>151.6</b>		<b>101.4</b>

From our assessment of the WINEP, Severn Trent Water has 29 sites with a single green driver for phosphorus removal. The above analysis suggests that they have only included £34.7m to deliver these schemes. This is despite the size of some of the sites, such as Worcester (Bromwich Road) STW with a p.e. of c.115,000 having a new 1mg/l permit (WINEP ID: 7ST201809), Tamworth STW with a p.e. of c.90,000 having a new 1mg/l permit (WINEP ID: 7ST201798) and Toton STW with a p.e. of over 65,000 having its permit tightened from 1mg/l to 0.25mg/l (WINEP ID: 7ST200745). We do note Ofwat's reallocation of £52.7m capex to phosphorus removal which Severn Trent Water had assigned to discharge relocation, but cannot reconcile this with WWn4. A proportion of this £34.7m is also associated with schemes with multiple phosphorus removal drivers (green and amber), and we presume the over-and-above cost of delivering the amber obligations has been included in their business plan as tabled above.

Whilst we appreciate that we do not necessarily have sight of every company's obligations and proposals, on the basis of the above assessment there is sufficient uncertainty to query whether Severn Trent Water has included their full WINEP (green and amber) permits in WWn4 but only the costs for their "green and high-certainty amber schemes" in WWS2. We recommend Ofwat review its model to include all green and amber phosphorus removal schemes as identified in the WINEP.

As described earlier, we identified an apparent error in the model spreadsheet related to Severn Trent Water's population. This has the effect of under-estimating the PE for that company across the five-years. Amending this would further widen the gap between Severn Trent Water's modelled allowance and its business plan figures: its revised modelled allowance would be £382.7 million compared to its business plan figure of £250.1 million. This only adds to our concerns outlined above concerning Ofwat's interpretation of that company's data.

#### iv) Modelling of 'amber' WINEP schemes

In our business plan we have costed all items classified as green (high certainty) or amber (medium certainty) in the WINEP. We developed an uncertainty mechanism to protect the customer in the case that schemes are removed from the WINEP during PR19.

We note the different approaches by a few companies regarding amber schemes in the WINEP, including:

- Severn Trent Water excluded "less certain amber projects"
- Thames Water excluded "a small number of atypical projects"

It can be inferred that these companies have removed their comparatively less cost beneficial schemes that did not have multiple statutory drivers attached to them, while incorporating those that did into their plans, which we would assume mean that the projects

in their plans would have comparatively lower costs on a per unit basis. This is a perfectly reasonable approach to take, however it risks polluting the estimates of modelled costs for the industry more generally. With respect to Severn Trent Water, the issue is compounded by it also being identified as within the efficient upper quartile against which every company is targeted.

We recommend Ofwat review its model to include all green and amber phosphorus removal schemes as identified in the WINEP.

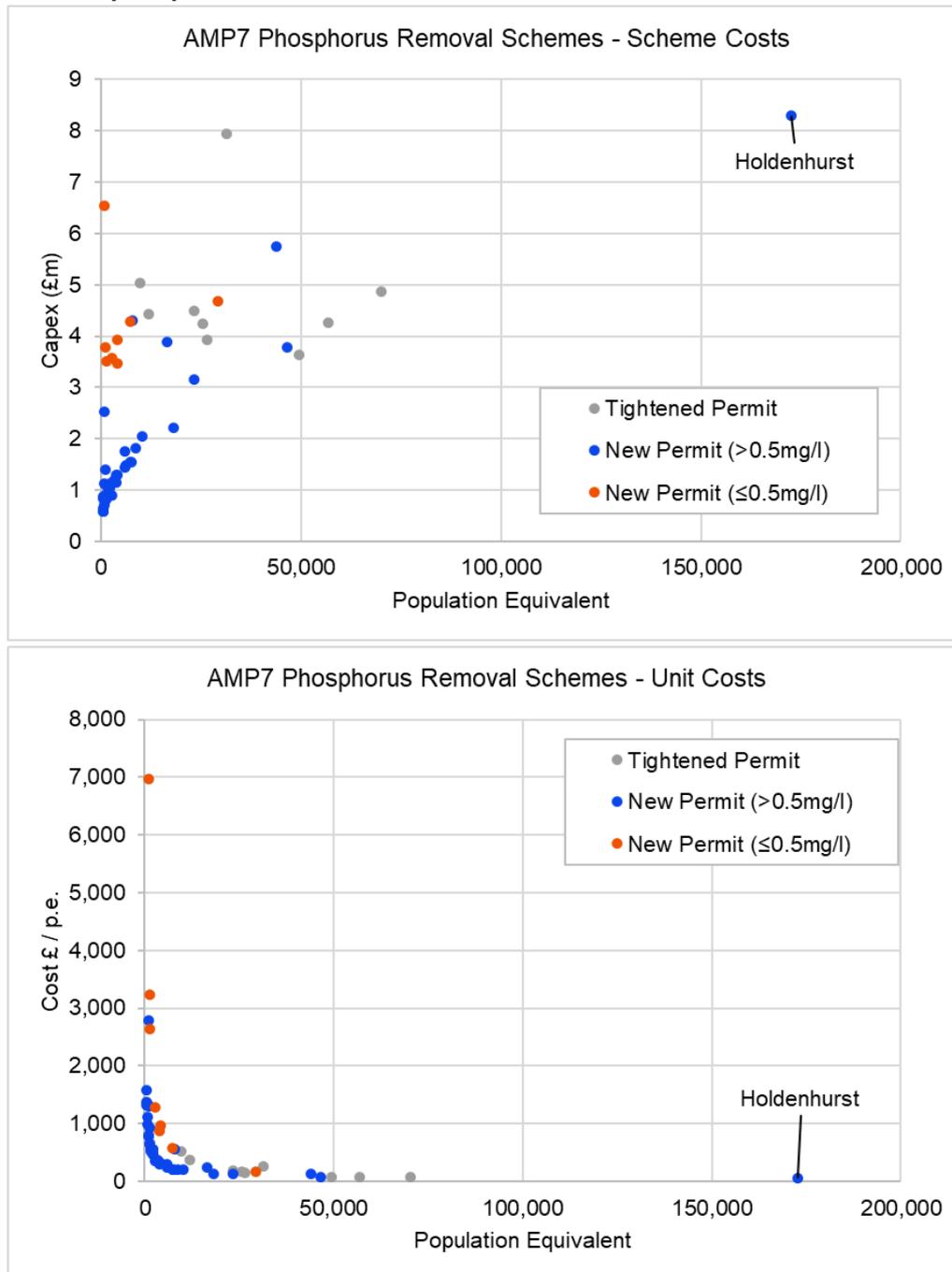
#### **v) Need for improvement at Berry Hill Sludge Treatment Centre**

As described in Annex C of Supporting document 5.1 – Protecting and enhancing the environment, as part of our PR19 business plan submission in September 2018, “the addition of ferric sulphate at Holdenhurst (Bournemouth) STW will significantly increase the raw sludge volume produced. Consequently, this affects sludge transfer and treatment at our Berry Hill Sludge Treatment Centre.”

Both in its initial assessment of plans and draft determination, Ofwat has not considered our costs associated with this work, with the statement: “Rejected as relates to sludge quality not P removal.” We do, however, note Ofwat’s comment in its draft determination sludge enhancement model, “We haven’t assessed Wessex Water costs for sludge which are submitted as part of its P removal line, because we didn’t reallocate them for the draft determination. We will do so for the final determination.”

Raw sludge from Holdenhurst STW is pumped via a 3.3km long rising main to Berry Hill STC, with liquors returning to be treated at Holdenhurst, again by pumping. The need for improvements at Berry Hill STC is directly related to phosphorus removal at Holdenhurst STW, hence our allocation of costs in data tables WWS2 and WWS2a to phosphorus removal (capex line 19: Current population equivalent served by activated sludge STWs with tightened/new P consents) and against the bioresources price control, as opposed to sludge enhancement (capex line 3: Sludge enhancement (quality)). Without the phosphorus removal driver, we would not be seeking funding for any enhancement improvements at Berry Hill STC.

Serving a population equivalent of approximately 175,000, Holdenhurst (Bournemouth) STW is the second largest STW in the Wessex Water region. By a significant margin it is also the largest site in our region requiring phosphorus removal, as shown in the following charts. By way of comparison, our next largest sites with new phosphorus removal obligations in AMP7 are Kinson STW for a new permit (p.e. c.46,000) and Trowbridge STW for a tightened permit (p.e. c.70,000).

**Figure 1: AMP7 phosphorus removal schemes – scheme costs and unit costs**

We described the various options we considered for Holdenhurst in Annex C referenced above. A summarised breakdown of work items along with capex costs is given below:

Work items at Holdenhurst STW:

- 2 chemical dosing plants with chemical delivery bunds with associated emergency showers and eye baths, serving process treatment stream 1 and stream 2, with twin 35m<sup>2</sup> and 25m<sup>2</sup> chemical storage tanks respectively.
- Chemical dosing into new inlet channel mixers upstream of stream 1 primary settlement tanks and stream 2 primary settlement tanks

Work items at Berry Hill STC:

- Replacement of existing 3.3km 150mm diameter raw sludge rising main from Holdenhurst to Berry Hill
- 4no. 545m<sup>3</sup> additional pre-thickened sludge storage tanks
- 1no. 1.5m width additional sludge belt thickener

**Table 5: Cost estimate breakdown for Holdenhurst STW and Berry Hill STC**

	Holdenhurst STW (£k)	Berry Hill STC (£k)
<u>Construction Value</u>		
Civil work items Labour, Plant, Material & Subcontract packages	1,077	1,224
Mechanical and Electrical work items Labour, Plant, Material & Subcontract packages	1,131	1,047
Supervision and Prelims	517	527
Contractor Fees	227	231
<b>Total Construction Value</b>	<b>2,952</b>	<b>3,029</b>
Design	436	356
Project Management	165	167
Third Party	63	95
Risk (15%)	518	522
<b>Total Scheme Capex Cost</b>	<b>4,134</b>	<b>4,168</b>
	<b>8,302</b>	

As detailed in Supporting document 8.11 – Assessing the costs of our enhancement programme (Sept 2018), cost estimates have been prepared by our experienced in-house estimating team, who also estimate live projects during the current price control period. We have carried out extensive external benchmarking of our cost estimates. This included a specific assessment of our phosphorus removal programme (refer to Appendix 8.11.A Chandler KBS report on P removal programme cost), which has demonstrated that our cost estimates are robust and efficient when compared with the external marketplace.

We therefore consider that the costs for enhancement to our Berry Hill STC for the increase in sludge from phosphorus removal should be included in full.

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### **Why the change is in customers' interests**

The change will enable us to continue with our innovative approach to phosphorus removal to achieve our obligations listed in the WINEP, and to continue to target 100% compliance with environmental nutrient standards for sewage effluent. This level of performance is valued by customers and our other stakeholders.

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**Links to relevant evidence already provided or elsewhere in the representation document**

- PR19 business plan submission (September 2018)
  - Supporting document 5.1 – Protecting and enhancing the environment
    - Section 3.2
    - Appendices 5.1.C, 5.1.D and 5.1.F
  - Supporting document 8.11 – Assessing the costs of our enhancement programme
    - Section 4.2
    - Appendix 8.11.A
  
- Response to Initial Assessment of Plans (April 2019)
  - Appendix 4 – Protecting and enhancing the environment: Response to IAP
    - Section 2.1
  
- Response to Draft Determination (August 2019)
  - Representation C8: WINEP: In the round efficiency challenge.