Bulk Charges for NAVs Operating in the Anglian Water Region

A Consultation Paper

22nd October 2018

Contents

Executive Summary and Illustration of Proposed NAV Tariff

1. On 8th May 2018, following a consultation process, Ofwat issued new Guidance for bulk charges to NAVs. The Guidance came into effect straight away, and AWS is consulting with NAVs and other stakeholders on its proposals for new "NAV tariffs" to comply with the Guidance. Our aim with this paper is to test the views of NAVs and other stakeholders on our draft proposals. We want to ensure that we can fully reflect upon respondents' views and the evidence they submit, before we conclude on the principles that guide our approach and the various trade-offs we have to address prior to finalising our tariff proposals.

2. The central requirement of the Guidance is that bulk charges should be set in line with a "wholesale minus" methodology, comprising the following elements:

Components of the Wholesale Minus Methodology

Relevant Wholesale Tariff

-

Avoided on-site ongoing costs including capital replacement

-

Avoided WACC on on-site assets

-

Avoided depreciation

↓

Bulk supply tariff

3. We have applied the methodology step by step and quantified each component separately in the interests of transparency.

4. The **relevant wholesale tariff** is a weighted average of our household and non-household published wholesale tariffs. Since the mix of properties on each site varies, this means that the resulting figures will vary from case to case. Further, since the relative proportions of household and non-household consumption can only be known accurately after the end of a charging period, there is a need for an e*x post* re-statement of the NAV tariff for each site. To address leakage, volumes recorded on the bulk meter at the site boundary will be adjusted downwards by 2.16% to reflect our estimate of what the on-site network losses would have been had we served the site instead.

5. We propose to apply a top-down approach using published Annual Performance Report ("APR") information to derive figures for avoided

ongoing on-site operating costs. This method will operate in favour of the NAVs, but it does have the advantage of simplicity and transparency. For 2018/19 it produces figures of £12.81 per connection for water and £8.64 per connection for (full service) wastewater.

6. For avoided **capital replacement costs** we have identified a typical mix of on-site assets and costed a future programme of replacement based on asset lives and assumed replacement "holidays". These future expenditures create increments to future RCV on which a return is earned and from which depreciation or "run-off" is calculated, giving rise to a stream of future cash flows assessed over 240 years. The rate of return is set at 4.74%, in line with the Guidance requirements to allow NAVs a higher return on RCV, but the process of discounting and annualising cash flows uses the PR14 allowed wholesale cost of capital of 3.60%, because that is the appropriate "time value of money" for comparing values in different time periods. This produces values per connection of £15.96 for water and £6.88 for (full service) wastewater.

7. The final two components, the **WACC** return and **depreciation** on the regulatory capital value (RCV) that would have been created when the site was originally developed had we served it instead of the NAV, are only specifically applicable for sites where the appointment was made before 1st April 2018 – "legacy sites". This is because, from that date, Ofwat has brought in changes to the way developments are financed, and we can provide the benefit of the "income offset" element of requisition charge calculations to NAVs in other ways. Our preference is to reflect the value of the income offset in the form of a reduction in the infrastructure charges that are paid by NAVs and developers alike.

8. The WACC and depreciation calculations are specific to each individual site, because the increment to our RCV that would have been created will have depended on the specific circumstances for each site. These elements will therefore constitute lump sum deductions from the annual bulk charge bill for each of the legacy NAVs. They will be arrived at by calculating what the change in RCV would have been had the NAV not been appointed, and rolling it forward year by year using the asset lives of the assets that would have been requisitioned to calculate the annual depreciation charge and indexing in line with Ofwat's standard approach.

9. Avoided local authority **rates** in relation to the up-front investment in a site are also only positive for legacy sites, because rates are a function of profitability which would not have changed if there had been no increment to RCV. For all sites, avoided local authority rates associated with future capital replacement investment are included in the annualised capital replacement values referred to above.

10. The following worked example illustrates how the bill for bulk water charges would be calculated for a hypothetical existing NAV, with 1,000 household properties using an average of 100m3 and 50 non-household properties using an average of 250m3 per annum. It assumes that the on-site network consists of 7.7m of water main per connection, giving a total of 8,085 metres.

Water Service Example

Information required	Provided by	
Volumes recorded on bulk meter	AWS	114,984m^3
Proportion of on-site consumption attributable to non-households	NAV	11.1%
Number of households	NAV	1,000
Number of non-households	NAV	50
Wholesale household fixed charge	AWS	£5.65
Wholesale household volumetric charge	AWS	£1.5181
Wholesale non-household fixed charge	AWS	£7.00
Wholesale non-household volumetric charge	AWS	£1.2959

Calculation of relevant starting point	Tariff	Unit	Amount	
Household fixed charge	£5.65	1,000	£5,650.00	
Household volumetric charge per m^3	£1.5181	100,000[1]	£151,810.00	
Non-household fixed charge	£7.00	50	£350.00	
Non-household volumetric charge per m^3	£1.2959	12,500	£16,198.75	
Sub-total				£174,008.75

Calculation of "minus" elements	No of connections	Per connection	Amount	
Avoided ongoing on-site costs	1,050	£12.81	£13,450.50	
Avoided future capital replacement costs	1,050	£15.96	£16,758.00	
Sub-total "generic" minus components				£30,208.50
Avoided WACC		£31,421.00		
Avoided Depreciation		£5,791.00		
Avoided Local Authority Rates		£9,479.00		
Sub-total site-specific legacy minus components				£46,691.00
Net bulk supply charge				**£97,109.25**

[1] The volumes of 114,984m^3 recorded on the bulk meter are adjusted downwards by 2.16% for hypothetical network losses, which produces 112,500m^3 chargeable volumes. 11.1% is attributable to non-households which is 12,500, leaving 100,000m^3 attributable to households.

11. The corresponding calculations for the wastewater side can be illustrated as follows. It is assumed that each of the foul and surface water sewer networks comprise 5.4m of sewer per connection, giving a total of 5,670m each. Note that it is assumed in this example that had AWS served the site the network would have been adopted, so there is no increment to RCV and only the "generic minus" components are applied:

Wastewater Service Example

Further information required	**Provided by**	
Wholesale household fixed charge	AWS	£65.10
Wholesale household volumetric charge	AWS	£1.6864
Wholesale non-household fixed charge	AWS	£80.00
Wholesale non-household volumetric charge	AWS	£1.5785

Calculation of relevant starting point	**Tariff**	**Unit**	**Amount**	
Household fixed charge	£65.10	1,000	£65,100.00	
Household volumetric charge	£1.6864	90,000*	£151,776.00	
Non-household fixed charge	£80.00	50	£4,000.00	
Non-household volumetric charge	£1.5785	11,250*	£17,758.13	
Sub-total				£238,634.13

Calculation of "minus" elements	**No of connections**	**Per connection**	**Amount**	
Avoided ongoing on-site costs	1,050	£8.64	£9,072.00	
Avoided future capital replacement costs	1,050	£6.88	£7,224.00	
Sub-total "minus" components				£16,296.00
Net bulk supply charge				**£222,338.13**

* Based on the standard return-to-sewer rate of 90%.

12. In developing this document we have identified a number of issues, specifically in our exploration of the "wholesale-minus" calculation which are set out in detail in the main body of the document. The feedback we seek on our proposals to address these issues is captured in the questions set out in section 1.7. The feedback we seek on our process for responding to this consultation is set out in section 1.8.

1. Introduction and Summary of Proposals

1.1 Background

1. Since 2007 nine new appointments have been made in our region involving three new suppliers ("NAVs") which will ultimately serve over 10,000 potential customers.[2] In most cases the NAV has sought bulk water and/or wastewater services from AWS at the edge of its appointment so that AWS brings treated water to the site and/or takes away and treats the wastewater. This leaves the NAV to operate and manage the local water distribution and/or sewerage networks, and provide retail services to the final customers. Several further applications are expected over the course of the next year or so.

2. Each bulk service is governed by an agreement between the two parties. Pricing terms constitute a significant element of the terms of the contractual relationship. Following a two-month consultation process that began on 8th November 2017, Ofwat issued guidance to companies on how bulk charges should be set going forwards – "*Bulk Charges for NAVs: Final Guidance*" (the **"Guidance**") on 8th May 2018.[3]

1.2 Purpose

1. The Guidance makes clear that Ofwat expects companies to agree bulk charges that are in line with its provisions,[4] and that it supersedes any earlier guidance relating to bulk supply charges.[5] It sets out Ofwat's preferred "wholesale-minus" approach together with details as to how it could and should be applied. It notes that legislation is in place that is expected to give Ofwat statutory powers to issue binding rules on bulk supply charging in due course, but urges companies to prepare and publish tariff information straight away:

   "…we expect incumbent water companies to adopt best practice and consider publishing bulk charges to provide as much information as early as possible from the date of publication of this guidance".[6]

2. It also indicates that pricing terms in existing bulk service contracts should be brought into line with the new arrangements:

   "…we expect that in most cases when this guidance comes into force the incumbent water companies will have to create and publish new bulk supply charges. These will supersede existing agreements between the incumbent

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2 New appointments and variations (NAVs) are limited companies which provide a water and/or sewerage service to customers in an area which was previously provided by the incumbent monopoly provider.

3 The document can be found at: https://www.ofwat.gov.uk/wp-content/uploads/2018/05/Bulk-charges-for-NAVs-final-guidance.pdf.

4 "*We will apply this guidance to any dispute about bulk charges between an incumbent water company and a NAV using our powers under the WIA91*" - Guidance p16.

5 Guidance p11.

6 Guidance p23.

water companies and the NAVs and prompt a number of changes. It would be good practice for incumbent water companies to take the initiative and update the bulk supply charges with their existing NAVs to reflect such changes, but in any case they should do so promptly when an existing NAV requests the bulk charges to be updated to reflect this guidance".

3. AWS has decided to adopt "best practice", and intends to develop NAV tariffs in line with the guidance in a manner that is both transparent and fair. In particular, it wants its existing NAVs as well as other stakeholders to be given the opportunity to participate in the development of those charges.

4. Accordingly, the purpose of this consultation document is to seek views on all elements of the application of the Ofwat guidance where alternative options are available. In particular, as with many areas of pricing, there are choices to be made involving trade-offs between, on the one hand, greater precision in calculation and complexity in implementation (involving more work for both NAVs and AWS) and on the other hand the acceptance of a degree of "averaging". We have endeavoured to develop a provisional position on all issues, but we stress that we retain an open mind on everything (within the requirements of the guidance) and will therefore reflect upon all of the views offered by respondents before developing a way forward.

1.3 Scope of Consultation

1. In the Guidance Ofwat distinguishes between two types of bulk arrangement: "bulk services between one incumbent water company and another", which it says are often called "water trades" and consist of transfers of very high volumes of water; and "bulk services from an incumbent water company to a NAV".[7] It indicates that the Guidance only refers to the second type. Accordingly this consultation paper only covers bulk services provided by AWS to current or future NAVs, and does not apply to "water trades".[8]

2. Ofwat also makes clear that:

   "NAVs must be free to choose which services they wish to purchase from the local incumbent water company. Therefore bulk charges should be flexible and relate solely to the services a NAV requests from the incumbent water company"[9]

3. AWS fully supports this position. Where a NAV can bring its own water resources, for example, or chooses to treat some of its wastewater itself, this may bring down cost and provide benefit to customers. However, at this juncture all of the NAVs operating in the AWS region take "conventional" bulk services from us, the only variation being that some deal with surface water runoff themselves and only require a "foul water" service from us. For

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7 See Guidance, p6.

8 The draft AWS water trading and procurement code has been published for consultation. See: https://www.anglianwater.co.uk/_assets/media/20180816_Draft_Trading_and_Procurement_Code_FINAL.pdf

9 Guidance, p16.

the time being, therefore, we are concentrating our efforts on the development of charges for these "default" situations and will look to develop pricing solutions for less conventional requirements as and when they arise,[10] in accordance with the requirements of the Guidance. In any event, the same general principles that emerge from this process are likely to be applicable.

4. It should also be made clear, at the outset, that although this paper uses the term "NAV tariffs" throughout, we are not pre-judging the outcome of the consultation in relation to the *form* that future bulk charges may take. As the Guidance indicates,[11] the material that we may eventually publish on bulk charges could resemble more of a methodology for NAVs to calculate their own bulk charges than what many people would recognise as a tariff *per se*. We are therefore using "NAV tariffs" in a broad sense, encompassing everything from the publication of a simple per m^3 price for water and/or wastewater to a detailed "algorithm" that requires the input of several items of data relating to the site in question in order for the charges to be calculated.

1.4 Structure of this Document

1. Ofwat describes the approach to pricing set out in the Guidance as a "*wholesale-minus approach"*, which *"…starts from the relevant wholesale tariff(s) and* ***deducts costs that the incumbent water company would no long incur if a NAV supplied the new development instead."*** The "minus" element comprises three components, namely on-site ongoing costs, the weighted average cost of capital for the on-site assets, and depreciation.[12]

2. This consultation paper is structured broadly along the lines of Ofwat's prescribed methodology. The following short section sets out the objectives and principles that we consider should guide the development of our NAV tariffs. Sections 3-7 cover the main tariff design issues, namely the relevant starting point (the wholesale tariff), the treatment of leakage, the calculation of the avoided on-site ongoing and capital replacement costs, the return on capital in respect of on-site assets, and depreciation of on-site assets. Section 8 explores further questions relating to the "form" of NAV tariffs, and in particular the extent to which they should apply prospectively or retrospectively. Section 9 sets out how the NAV tariff can be expected to evolve in the future in response to movements in costs and regulatory changes, and finally section 10 addresses the question of replacing the pricing terms in existing agreements with NAVs with the new tariffs.

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[10] For example, if a NAV chose to recycle some of its wastewater so as to provide a "grey water" supply service to its customers, a modified approach to pricing for its wastewater service would have to be applied, (a) to reflect the fact that the standard "90% return to sewer" assumption would not be appropriate, and (b) to take account of the fact that the wastewater discharged to our sewer network could be more concentrated than standard strength domestic sewage.

[11] See, in particular, pages 23 and 24.

[12] Guidance pages 16 and 17.

3. The way in which the structure of this paper maps on to the methodology set out in the Guidance is depicted below.

Components of the Wholesale Minus Methodology	Section
Relevant Wholesale Tariff	3
-	
Avoided on-site ongoing costs including capital replacement	5
-	
Avoided WACC on on-site assets	6
-	
Avoided depreciation	7
↓	
Bulk supply tariff	

4. Section 4 sets out our proposals on leakage. Sections 8, 9, and 10 are common to all four elements of the methodology. Questions for consultation are raised in the sections to which they are relevant, and are also collated in section 1.7 below for ease of reference.

5. In the interests of making the navigation of the paper as easy as possible and avoiding confusion, we draw attention to the fact that "avoided WACC" and "avoided depreciation" arise in two distinct contexts. As per the Guidance, sections 6 and 7 concentrate on the avoided WACC and depreciation associated with the initial, up-front investment in the site that is now served by the NAV. As a completely separate issue, our approach to the future investment in capital replacement that we would have had to have carried out employs a regulatory accounting approach that produces a future stream of avoided cash flows for WACC and depreciation. These are covered in section 5.

6. Finally, we have number-sequenced the paragraphs within each sub-section for ease of reference in future correspondence.

1.5 Use of Numerical Examples and Cost Estimates

1. Throughout the document we seek to illustrate the issues and calculations by reference to a hypothetical NAV in our area. Note that we have deliberately simplified the illustration so that it constitutes a single site developed at a single point in time: in practice it may represent the first phase of a more complicated development. The essential features of the notional site are set out below.

Features of Illustrative NAV Example	
Number of households	1,000
Average consumption of households	100m^3
Number of non-households	50
Average consumption of non-households[13]	250m^3
Proportion of customers connected for foul and surface water drainage	100%
Length of on-site network mains	8,085m
Length of foul sewer	5,670m
Length of surface water sewer	5,670m

2. In addition, we use the current year, 2018/19, as the basis for our illustrations. We have endeavoured to present figures for cost estimates that are indicative of those that would be applicable were the NAV tariff already in effect, in order to provide respondents with a reasonable idea of the orders of magnitude involved. However, in some areas further empirical work may lead to refinement of these estimates, and of course all figures are subject to change following the results of this consultation process.

1.6 Summary of Proposals

1. The Guidance issued by Ofwat on 8th May 2018 provides a set of principles for the development of NAV tariffs. As we worked through what they mean in practice, it quickly appeared to us that developing and publishing a simple tariff of the conventional two-part form (i.e. *£x* per annum plus *£y* per m^3) would be problematic, because this would create cross-subsidies between NAVs that we judged would be unacceptable (see sections 3-8 for further explanation of this finding). Rather, we concluded that a more detailed formulation would be necessary in order to meet the principles set out in the Guidance.

2. In addition, a notable feature of the proposed NAV tariffs is that, so far as initial up-front on-site investment is concerned, the applicability of the "WACC on on-site assets" and "depreciation" components of the "minus" are dependent on when the NAV was, or will be, appointed. This is because the rules on the financing of new development changed on 1st April 2018 and are due to change again on 1st April 2020, creating three distinct periods. The "WACC" and "depreciation" components of the "minus" calculation only apply to initial on-site investment at the pre-April 2018 "legacy" NAV sites. The same is true of the "local authority rates" components of "ongoing on-site operating costs". Further details are set out in section 6 below.

[13] It is also assumed that none of the 50 non-household customers uses in excess of 500m^3 per annum, i.e. that they would all pay our "Streamline Green" tariff were the site served by us.

3. Our proposed NAV tariffs for each of water and wastewater for a typical[14] site are presented below. As explained above, the figures relate to the current (i.e. 2018/19) charging year, and should be treated as indicative.

Water Supply NAV Tariff

For the charging year (or *pro rata* for a part thereof):

- a fixed charge of £5.65 per household connection;
- a fixed charge of £7.00 per non-household connection;
- a volumetric charge to be calculated as a weighted average of a household rate of 151.81p per m3 and a non-household rate of 129.59p per m3, the weights to be provided by the NAV, applied to the volumes recorded on the bulk meter less an allowance of 2.16% for leakage and other unbilled volumes;

less

- £12.81 per connection in relation to avoided on-site ongoing operating costs;
- £15.96 per connection in relation to avoided on-site future capital replacement costs; and
- ***for legacy NAVs only***, site-specific amounts representing each of the WACC and depreciation on the on-site investment that would have accrued to our RCV, as well as the local authority rates that would have been payable in relation to the site.

Wastewater NAV Tariff

For the charging year (or *pro rata* for a part thereof):

- a fixed charge of £31.10 per household connection for foul water only; or
- a fixed charge of £65.10 per household connection for foul and surface water;
- a fixed charge of £45.00 per non-household connection for foul water only; or
- a fixed charge of £80.00 per non-household connection for foul and surface water;
- a volumetric charge to be calculated as a weighted average of a household rate of 168.64p per m^3 and a non-household rate of 157.85p per m^3, the weights to be provided by the NAV, applied to the volumes charged for water supply multiplied by the applicable return-to-sewer rate;

less

- £8.64 per connection in relation to avoided on-site ongoing operating costs; and
- £6.88 per connection in relation to avoided on-site future capital replacement costs.

[14] The calculations assume no unusual or "non-standard features", e.g. no large non-household users, no trade effluent customers, and so forth. Departures from the norm will generally be dealt with on a case-by-case basis.

4. Note that there is generally no element in the wastewater tariff for the WACC and depreciation on the on-site assets created as part of the up-front development of the site[15], because the standard practice is for sewerage networks to be adopted rather than provided by means of a requisition notice. Where, as an exception to the norm, it appears that a sewerage requisition notice would in fact have been served on us had any of the legacy NAVs not been appointed, additional site-specific deductions for the WACC and depreciation costs that we would have incurred will be made. See section 6 for further details.

1.7 List of Questions for Consultation

Q1. Do you agree with our proposed objectives and principles for the development of our NAV tariffs? If not, please explain what alternatives you think we should consider.

Q2. Do you agree that we should publish the elements necessary to enable each NAV to calculate the weighted average wholesale tariff for each site, rather than a single generic price? If not, please explain what alternative you would prefer and why.

Q3. Is it reasonable to ask NAVs to provide certain information to support both the implementation of the tariff during the applicable charging year and the retrospective "true-up"? If not, please give reasons, and provide any alternative proposals if applicable.

Q4. Do you agree that a downward adjustment to recorded volumes should be made for charging purposes in respect of network losses between the bulk meter at the boundary of the NAV site and the end-user customers?

Q5. Do you agree with our proposed approach to making adjustments to billed volumes to reflect potential hypothetical leakage on the NAV site? If not, please set out the alternative(s) you think should be considered.

Q6. Do you support our proposal to make a flat percentage reduction to meter readings in respect of the network losses that would have occurred had we served NAV sites? If not, please set out what alternative approach you would prefer.

Q7. If you support the flat percentage adjustment approach to address network losses, do you agree that 2.16% is a reasonable allowance? If not, what alternative figure do you propose and why?

Q8. Have we successfully captured all of the categories of on-site cost that need to be included in the "minus" calculation, or do you consider that we have missed anything?

[15] This is as opposed to future capital replacement expenditure, the WACC and depreciation elements of which are addressed as part of the calculation of the generic capital replacement annuity.

Q9. Do you agree that we should estimate hypothetical on-site ongoing costs with reference to the actual costs that we typically incur across our networks?

Q10. Do you support our proposal to use published data to derive the ongoing on-site cost element of NAV tariffs? If not, please explain why, and what alternative you would prefer.

Q11. Do you agree that the ongoing on-site cost element of the tariff should be expressed on a common per-connection basis for all NAV sites? If not, what alternative would you prefer?

Q12. Do you have any comments on the indicative calculations for on-site ongoing costs for 2018/19?

Q13. Do you consider that a generic approach for capital replacement is preferable to carrying out site-by-site assessments of hypothetical future capital investment needs?

Q14. Do you support our proposal to apply a common set of assumptions for the duration of capital replacement "holidays" so that this element of NAV tariffs can be the same for all sites?

Q15. Do you agree that it is reasonable to set the replacement holiday for each type of asset at one third of the expected asset life?

Q16. Please provide comments on our proposed methodology to give effect to the generic approach to calculating the avoided capital replacement costs, providing alternative suggestions where applicable. In particular:

a) do you agree with our identification of asset categories; is anything missing?

b) do you support our assumptions on asset lives?

c) do you have any comments on our proposed approach to unit costing and efficiency projections?

d) do you agree with our use of the NAV-specific WACC proposed by Ofwat in the Guidance for the projected return on RCV, and the wholesale WACC used by Ofwat at PR14 to convert future values into an ongoing annuity?

Q17. Are we right to conclude that the return on RCV and depreciation components of the "minus" calculation in the methodology set out in the Guidance are only relevant for the bulk charges for NAVs appointed before 1st April 2018 so far as up-front investment is concerned (as distinct from future capital replacement)? If you have a different view, please provide details of other NAVs to which you think these elements are applicable.

Q18. Do you agree with our proposed approach to:

a) the definition of the incremental RCV on which a return would have been earned;

b) the calculation of the income offset?

In each case, please indicate where you disagree and what alternative approach(es) you would propose.

Q19. Do you agree with our analysis of the derivation of "avoided rates costs"? If not, please explain what alternative approach you think is appropriate.

Q20. What are your views on our proposed approach to the depreciation policy to be applied to the net capex that would have been added to our RCV at the time a site was developed, including the asset life assumption?

Q21. Do you have any comments on the "rolling RCV" calculations that we have set out, and the way that we propose to derive the return on capital, depreciation, and rates elements of the "minus"?

Q22. What are your views on the proposal to apply a retrospective "true-up" as part of the application of NAV tariffs so that the effective price paid by the NAVs at each site is correct?

Q23. Do you agree that we should aim to set provisional tariffs that are based on the best available forecasts for the relevant Charging Year?

Q24. Do you have any comments on the proposed process for calculating provisional NAV tariffs in advance of the relevant Charging Year, and carrying out the "true-up" after the end of the Charging Year?

Q25. Do you have any comments on our proposed approach to dealing with future regulatory and other changes? Please indicate if there are any additional points you think we should consider.

Q26. Do you agree that new NAV tariffs should be backdated to 8th May 2018 for existing NAVs? If not, please explain what alternative approach you propose.

1.8 How to Respond

1. Please send your response to this consultation to NAVs@anglianwater.co.uk by 5pm on 16th November 2018.

2. In the interests of transparency we propose to place responses on the NAV section of our website. If you wish any parts of your response to be redacted on the grounds of commercial confidentiality, please provide a version with the relevant sections blacked out.

3. Following receipt of responses, we intend to prepare a further document which will summarise respondents' views on the 26 questions, and explain the changes to the NAV tariff proposals set out herein that we intend to make as a consequence. We expect to publish this four weeks after the deadline for receipt of responses. We will then prepare the 2019/20 NAV tariffs for publication in the New Year.

2. Objectives and Principles

1. In approaching the development of NAV tariffs, we intend to be guided by the following objectives and principles.

2. First, it is our intention to develop NAV tariffs that are fully compliant with the Guidance. As Ofwat has indicated, binding rules on charging for bulk services are not yet in place, but it is our aim to carry out this exercise as though they were. We are also responsible for ensuring that we do not infringe the Competition Act 1998 and that we meet any other relevant statutory obligations under the Water Industry Act and other legislation.

3. Second, we want our NAV tariffs to be fair. In particular, we aim to ensure that there is a level playing field between NAVs, Self-Lay Organisations (SLOs) and our own services.

4. Third, we aim, as far as possible, to ensure that charges are transparent, so that prospective NAVs can readily form a reasonable view of what bulk charges they could expect to face when evaluating whether or not to compete for a site; existing NAVs can plan their businesses with more certainty; and market participants more generally are able to understand why the charges are what they are, so as to minimise the scope for misunderstanding and dispute.

5. Fourth, we are mindful of the importance of efficiency in compiling a set of NAV tariffs. Implementation has the potential to impose information and other transaction-related costs on both ourselves and NAVs, and we want to make sure that these are as low as possible.

6. Finally, the bulk agreements into which we enter with the NAVs in our area are long term contracts that need to work for both parties over a prolonged period. Accordingly, we will seek to ensure that, as far as possible, our NAV tariffs are both robust and flexible in such a way that they can accommodate future regulatory change.

Questions for Consultation

Q1. Do you agree with our proposed objectives and principles for the development of NAV tariffs? If not, please explain what alternatives you think we should consider.

3. The Relevant Starting Point

3.1 Guidance Requirements

1. The first step in the application of the "wholesale-minus" approach is the identification of the relevant start point. The Guidance states:

   "*…the relevant starting point is the set of the incumbent water company's wholesale tariffs that reflects the NAV's potential end-customer base. This requires creating an 'overall weighted average' tariff (or providing all the tariff elements for a NAV to construct it) that would reflect the combined wholesale charges of all the NAV's customers."*[16]

2. It is worth noting that this requirement contrasts with the practice that we have generally followed in setting bulk charges to NAVs in the past, namely to apply end-customer large user tariffs. There are two important differences: first, the large user tariffs include both wholesale and retail elements; and second it is the "*wholesale tariffs that reflect the NAV's potential end-customer base*" that we are required to use going forwards, whereas we previously treated NAVs as a single supply which meant that the volumes of the individual end user customers could be aggregated together for tariff selection purposes.

3.2 Our Wholesale Charges

1. Our wholesale charges are set out in a Schedule that is published in early January of each year. The charges themselves apply from 1st April, and are valid for 12 months. They are set in accordance with Wholesale Charging Rules published by Ofwat[17], and are subject to the over-riding constraints of the wholesale price controls that were determined by Ofwat at the 2014 price review, "PR14".[18]

2. By way of illustration, our current 2018/19 wholesale charges for the customer classes that are most likely to be relevant to a NAV site in the Anglian Water region are as follows (see over):

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16 Guidance, p18.

17 See: https://www.ofwat.gov.uk/publication/wholesale-charging-rules-information-requirements/

18 A new set of price controls will come into effect on 1st April 2020, following the Price Review that is currently being undertaken by Ofwat.

	Household	Non-household[19]
Measured Water		
Fixed charge (p.a.)	£5.65	£7.00
Volumetric charge (per m^3)	151.81p	129.59p
Measured Sewerage		
Fixed charge – connected for surface water (p.a.)	£65.10	£80.00
Fixed charge – not connected for surface water (p.a.)	£31.10	£45.00
Volumetric charge (per m^3)	168.64p	157.85p

3. Since wholesale charges are revised annually (as is the case for end-user charges), it follows that each NAV tariff will need to follow the same cycle, and have effect for a period of 12 months. Under Ofwat's wholesale charging rules we are required to publish wholesale charges no later than 11 weeks before the data on which they are to come into effect, i.e. 1st April. Depending on whether or not it is a leap year, this means publication by either 13th or 14th of January.

3.3 Single Generic Tariff or "Toolkit"?

1. The calculation of the "overall weighted average water tariff" referred to in the Guidance can be illustrated as follows, using the example site set out in section 1.5 above.

Fixed Charge = 1,000 x £5.65 + 50 x £7.00

= **£6,000 per annum**

Volumetric Charge = (1,000 x 100 x £1.5181 + 50 x 250 x £1.2959) / (1,000 x 100 + 50 x 250)

= **£1.4934/m^3**.

[19] This assumes, for the purposes of illustration, that all non-household customers use less than 500m^3 per annum, and therefore pay the "Streamline Green" tariff. If any customers on a NAV site use more than this threshold, then other wholesale tariffs would apply.

2. The corresponding "overall weighted average sewerage tariff" for the same site, assuming that all the customers on site are connected for surface water drainage and that our standard 90% "return to sewer" rate applies, can be illustrated as follows:

Fixed charge = 1,000 x £65.10 + 50 x £80.00

= **£69,100 per annum**

Volumetric charge = (1000 x 90 x £1.6864 + 50 x 225 x £1.5785) / (1,000 x 90 + 50 x 225)

= **£1.6744/m^3**.

3. It is immediately evident that the weighted average wholesale tariffs that the Guidance requires undertakers to use as the start point will differ not only from NAV to NAV, but also from site to site (other than by coincidence), because the precise mix of customer types will inevitably vary from one location to another. In other words, the "right" weighted average wholesale tariff is different for each NAV site. In theory, we could calculate a single regionally-averaged weighted wholesale charge to apply to all of the NAV sites in our area, but such a generic approach would mean that some sites would be over-paying for their bulk services whilst others would be under-paying. This would not be in line with the objectives set out in section 2 above, and indicates that the creation of a "tool-kit" or "algorithm" to be applied for each site is likely to be preferable to a specific numerical tariff.

4. A counter-argument could be made to the effect that the precise composition of each site is not known in advance anyway, and that the weighted wholesale tariff for each site might have to be subject to a retrospective "true-up" (see section 8 below: "*The proposed form of the tariff and how it could be applied*"). In others words, if the correctly weighted wholesale tariff can only be ascertained retrospectively in any event such that the NAV is effectively paying "on account" during the course of the year, the parties might just as well "make do" with a single generic weighted wholesale charge in the meantime.

5. We are not attracted to this option: it has the potential to mislead prospective NAVs and other stakeholders and could give rise to significant cross-subsidies between sites in the year, notwithstanding that these may be the subject of "true-up" after the event.

6. Another potential objection to the "toolkit" approach to the derivation of the starting point is that it requires NAVs to submit detailed and accurate information on an annual basis to support the derivation of the tariff for each site. This could involve forecast data, out-turn data, or both. This adds to the complexity of the implementation of NAV tariffs. However, since the Guidance specifies the calculation of a weighted average wholesale tariff, which will necessarily be site-specific, we do not see a way of avoiding this requirement.

7. In summary, we propose that the "relevant starting point" be expressed simply as the individual elements of the applicable wholesale tariffs. In advance of the charging year the NAV would provide the forecast information necessary to calculate the aggregate fixed charge and the appropriate weighted average volumetric charge to be used for billing during the year. The NAV would then provide the actual out-turn information after the end of the charging year for the purposes of the retrospective "true-up". See section 8 below for further details on the proposed process for the application of the tariffs.

Questions for Consultation

Q2. Do you agree that we should publish the elements necessary to enable each NAV to calculate the weighted average wholesale tariff for each site, rather than a single generic price? If not, please explain what alternative you would prefer and why.

Q3. Is it reasonable to ask NAVs to provide certain information to support both the implementation of the tariff during the applicable charging year and the retrospective "true-up"? If not, please give reasons, and provide any alternative proposals if applicable.

4. Taking Account of Leakage

4.1 The Issue

1. There are two distinct leakage-related issues that arise in connection with the application of the Guidance. One is the costs of leakage control in the NAV area that AWS would otherwise have incurred had the inset appointment not been made. This falls within the "on-site ongoing costs" component of the "minus" part of the methodology set out in the Guidance, which is the subject of section 5 below.

2. The other issue arises in connection with the effect of the on-site leakage itself (as well as other "losses" such as "operational use" and "water delivered unbilled"). As described in section 3 above, the "relevant start point" is defined with reference to wholesale tariffs that constitute the largest part of end-user final tariffs, and which take the form of a fixed charge per customer and a volumetric charge per m^3. The problem arises because the "per m^3" used in this context refers to water delivered to end-user customers, whereas volumes charged to NAVs are generally measured using the bulk meter situated at the boundary of the site. So, if water is lost from the on-site network in the form of leakage between the bulk meter and the end-users' premises, the application of a given per m^3 rate at the bulk meter will be equivalent to a higher *effective* volumetric rate at the premises of the end-user customers than what was intended.

4.2 Options

1. In order to address this issue an adjustment to the volumes recorded on the bulk meter needs to be made as part of the application of the NAV tariff. This adjustment can be calculated using one of two possible approaches:

- make an estimate of how much water would hypothetically have leaked from the on-site network had the NAV not been appointed and the site been served directly by AWS instead; or

- use measurements of the *actual* difference between the volumes passing through the bulk meter and the sum of the volumes recorded on the meters used to charge the end-customers.

2. Although the second option is more readily verifiable, it has two drawbacks. First, the actual leakage on the NAV's network is not necessarily a reasonable indicator of what leakage *would* have occurred had the site been served by AWS. It all depends on the leakage control strategy adopted by the NAV and how that compares with the strategy that we would have deployed, which may be quite different.

3. Second, this option would generate poor incentives. If the actual leakage on the NAV site were deducted from the volumes recorded on the bulk meter then the NAV would effectively be paying the NAV tariff on the flows recorded at its customer meters, and there would be no apparent incentive for it to incur costs to find and fix the leaks on its network since the cost of the water lost would be borne by AWS, not the NAV. This would not be in line with the objectives set out in section 2 above: it would be inconsistent with the principle of the "level playing field", and could encourage inefficient levels of leakage.

4. Consequently, we consider that it would be preferable for the leakage adjustment to be based on a notional estimate of how much water could have been expected to have been lost on the NAV site had it been served by AWS instead.

Questions for Consultation

Q4. Do you agree that a downward adjustment to recorded volumes should be made for charging purposes in respect of network losses between the bulk meter at the boundary of the NAV site and the end-user customers?

Q5. Do you agree with our proposed approach to making adjustments to billed volumes to reflect potential hypothetical leakage on the NAV site? If not, please set out the alternative(s) you think should be considered.

4.3 Methodology for Calculating the Adjustment for Hypothetical Losses

1. Leakage from water distribution networks is a function of a wide range of factors, including pipe size and material, age, the type of methods used for connections, soil type, topography, the influence of third party activity, network pressure, and so forth. Predicting with any accuracy what the rate of leakage would have been from a local distribution network had a NAV not been appointed is a challenging task. However, it may be possible to derive a "rule of thumb" that provides a reasonable basis for estimating what the leakage adjustment should be at each NAV site.

2. There are choices to be made, however, as to how detailed the methodology for calculating the adjustment should be. The most straightforward approach might involve applying the assumption that leakage on the hypothetical network that AWS would have operated would have been at the same rate, per km, as all of the rest of the company's distribution mains. So, for example, in 2017-18 leakage across the 38,419.7 kms of distribution mains in the Anglian Water region[20] was 138.19 megalitres per day,[21] equivalent to 1.3m^3 of water lost per metre of main per annum. Under this option, our illustrative NAV site with a mains network of 8.085km would have an estimated total of 10,614m^3 of losses across the year, which could be deducted from the actual volumes recorded on the bulk meter. This comes to 8.62%[22] of the volumes recorded on the bulk meter. The information burden on the NAV would be comparatively light for this option, as all that would be required is a single figure for the length of main on the site which would only need to be updated as and when any extensions took place.

3. There are several reasons why this approach could be viewed as over-simplistic and likely to produce a significantly inaccurate estimate of hypothetical on-site leakage. For example, it assumes that the average rate

[20] Source: Annual Performance Report, Table 4P line 55.

[21] Source: Annual Performance Report, Table 4P line 74.

[22] 10,614/(1,000x100+50x250+10,614).

of leakage per km in the smaller diameter mains that would tend to characterise NAV sites can be assumed to be the same as in larger diameter mains in the "upstream" part of the network. All else equal, this simplification would be expected to work in favour of the NAVs. Similarly, since the older parts of the network did not benefit from the technological advances that AWS and NAVs can take advantage of when laying new development mains today, the propensity of pipes in NAV areas to leak could be expected to be well below the average for the whole of the AWS system. If this is the case, this simple approach to the adjustment would also tend to favour the NAV. Indeed, the figure of 8.62% for the proportion of water that is supplied to the site that would be deemed to be lost through leakage under this approach is unrealistically high.

4. A further complication arises due to the fact that not all leakage necessarily occurs on pipes that are classified as "water mains". Communication pipes – the pipes that connect each individual property to the main – can also leak. This could be addressed by partitioning leakage in the Anglian region between losses from mains and losses from communication pipes, and then counting and measuring the communication pipes on the NAV site, and applying average communication pipe leakage figures based on experience across the whole of the AW region to that part of the overall leakage calculation, leaving the remainder to be addressed using the per-kilometre-of-mains approach described above. Further elaboration could occur as other drivers of leakage, such as soil type and age, are added into the methodology, and the approach evolves from the simple leakage-per-unit approach outlined above into a more complicated algorithm. In general, the more detailed the algorithm, the more accurate the results it could be expected to produce, but greater complexity also brings additional information requirements for both AWS and NAVs.

5. We have given careful thought to the options for making an allowance for the losses that would have occurred on a NAV site had it been served by us. We are not attracted to the idea of a detailed algorithm, because it is data intensive and relies upon the use of internal company information that is not readily visible to stakeholders. Likewise, although the simple "per m^3 of main" approach is simple and verifiable, we believe that it is just too crude and will tend to overstate hypothetical on-site losses by several orders of magnitude.

6. Instead, we consider that a simple, flat percentage adjustment to the flows recorded on the bulk meter should be applied. Volumes are likely to bear a reasonable relationship to the extent of the on-site network and the number of connections, which can be considered to be prime drivers of leakage, and a flat percentage has considerable advantages in terms of simplicity and transparency.

7. As to how big the percentage adjustment should be, on the one hand, as noted above, the figure of 8.62% that would be implied by looking at the rate of losses per km of main across the Anglian region is clearly far too high, because new development mains are generally smaller, newer, and technologically superior to those that comprise the rest of the network. On the other hand losses are unlikely to be as low as zero, because even the newest and best-laid networks may be affected by unusual ground movements or third party activity. Moreover, the percentage adjustment

needs to be enough to cover other types of losses such as any operational use or "water delivered unbilled" (although these ought to be negligible on new sites as well).

8. Given the balance of factors involved, we think that a reasonable figure would be much closer to the lower end of this range of possibilities than the upper end. Specifically, we think that a figure one quarter of the way between 0% and 8.62% would be appropriate. Accordingly, for all NAV sites, we propose to make a downward adjustment of **2.16%** to volumes recorded on the bulk meter to take account of leakage and other types of network losses.

Questions for Consultation

Q6. Do you support our proposal to make a flat percentage reduction to meter readings in respect of the network losses that would have occurred had we served NAV sites? If not, please set out what alternative approach you would prefer.

Q7. If you support the flat percentage adjustment approach to address network losses, do you agree that 2.16% is a reasonable allowance? If not, what alternative figure do you propose and why?

5. Assessment of Ongoing On-Site Costs Including Future Capital Replacement

5.1 Overall Approach

1. Hypothetical ongoing on-site costs will, in many cases, constitute the largest part of the "minus" element of the calculation prescribed by the Guidance. Ofwat's November 2017 consultation left open certain aspects of the approach to be taken to this component, but the final Guidance settled the outstanding issues. In particular:

- the ongoing costs of operating and maintaining the on-site assets should be assessed with reference to the costs that the incumbent avoids as a result of the fact that the NAV is serving the site rather than the incumbent – not the costs that the NAV bears;[23] and

- where a NAV incurs additional costs because it provides additional services to its customers that would not have been provided by the incumbent, those costs are not relevant for the purposes of calculating the NAV tariff.

2. Our proposed approach is to calculate the answer to the following question: what expenditures would we have incurred over a long period in operating and maintaining the site, including the replacement of infrastructure in due course? By "long period" we mean long enough to capture the capital expenditure that we would need to have planned for in order to replace assets as and when they required renewal. We consider that modelling such expenditures over a period of 240 years would be sufficient, and intend to apply the principle articulated by Ofwat in the Guidance: i.e. to "*consider the level, timing and profile of all the costs incurred over the lifetime of the asset and estimate an equivalent annuity*."[24]

Question for Consultation

Q7. Do you agree with our proposed overall approach to the assessment of on-site ongoing costs? If not, please explain why, and set out what alternative approach you wish to put forward for consideration.

5.2 The Scope of On-Site Ongoing Costs

1. We have given careful thought to the composition of "on-site ongoing costs", and consider that they can be categorised as follows:

- operating expenditures on resources (including hired and contracted services), transport and materials required to **operate and monitor** the network on the NAV site, including the fixing of bursts, leakage control, network inspection, responding to sewer collapses, dealing with flooding incidents and other types of emergency response – all including appropriate "general and support" overheads. Note that "local authority rates" related to

[23] See Guidance, Appendix 1, pages 11 – 13.

[24] See Guidance, page 20.

up-front investment in the site are dealt with in section 6 below – even though they are characterised as operating expenditure for regulatory accounts purposes – for reasons that are explained therein. Local authority rates in relation to future capital replacement investment are included in the calculations set out in section 5.3.2 below;[25] and

- capital expenditure on the **replacement of on-site assets** over time, including mains and associated fixtures such as valves, communication pipes, sewers and meters. Note that although a NAV site may have a sewage pumping station, this is unusual: consequently, for the purposes of the development of wastewater NAV tariffs pumping stations are disregarded. We will deal with any that do arise on a case-by-case basis.

2. In some circumstances a NAV may ask AWS to carry out certain activities on its site on its behalf, e.g. emergency response. Where this is the case the assessment of what costs we avoid by not serving the site is unaffected, as any ancillary service provided to the NAV is not part of the core bulk supply service and would be addressed through a side agreement.

3. The following section considers in detail how each of the above could be calculated.

Question for consultation

Q8. Have we successfully captured all of the categories of on-site cost that need to be included in the "minus" calculation, or do you consider that we have missed anything?

5.3 The Calculation of the Components of Ongoing On-site Costs

1. By definition, the costs that AWS would have incurred had it served a NAV site cannot be measured, because they are hypothetical. Our task in developing NAV tariffs, then, is to arrive at an estimate of those costs that is reasonable and fair. The Guidance offers some pointers as to what could constitute an acceptable approach:

   "While new assets are, initially, less likely to require the same level of maintenance as older assets, in later periods maintenance costs would be higher. Therefore, as a general principle it would be inappropriate to assume that the new assets, such as the on-site infrastructure for a new development, will have a very low maintenance costs simply because they would be newer than any of the assets currently in the ground…. The incumbent's historical costs could be a reasonable and practical proxy for estimating the ongoing maintenance costs. These costs will cover infrastructure built at different historical times and thus the average maintenance costs could be a reasonable proxy for the lifetime on-site maintenance costs of newly-built assets."

[25] Note: for the avoidance of doubt, this category is not intended to cover all of the activities that a NAV actually carries out with respect to a site. For example, meter reading and other customer-facing activities are part of the retail function, and are therefore already automatically excluded from the wholesale tariff start point.

2. In our experience, the ongoing costs associated with newly-built parts of the network are indeed, in general, lower than those associated with older areas. This means that adopting the suggested approach of drawing on our historical region-wide cost evidence will systematically favour the NAV for at least several years while its network ages, and potentially indefinitely if it is the case that technological advances have lowered the long term operating costs of networks laid today as compared with those laid in the past, a possibility acknowledged by Ofwat.[26]

3. On the other hand, using historical cost information has the advantage that it can be evidenced and verified, whereas an exercise to estimate the hypothetical costs that AWS would have incurred will inevitably involve a degree of conjecture, and might therefore be more open to dispute. In addition, it is possible that there are some NAV sites where, due to abnormal factors of which we could not possibly be aware, our hypothetical operating costs might in fact have been higher than the average. To the extent that the proxy approach suggested in the Guidance provides additional benefit to NAVs in general, there is less chance that the presence of such abnormal factors means that the allowance built into the NAV tariff might not be adequate overall.

4. For these reasons we are minded to adopt the approach suggested in the Guidance, and to estimate hypothetical on-site ongoing costs with reference to the actual costs that we incur across our region.

Question for consultation

Q9. Do you agree that we should estimate hypothetical on-site ongoing costs with reference to the actual costs that we typically incur across our networks?

5.3.1 Operating and Monitoring the Network

1. As with the choice between using actual historical costs and estimating hypothetical costs, the methodology for identifying a reasonable figure for ongoing operating costs involves a trade-off between precision and transparency.

2. In principle, we could carry out a detailed bespoke "bottom-up" analysis of historical costs, pinpointing expenditures on those parts of the network that most closely resemble NAV sites (i.e. the comparatively modern parts of our small diameter distribution and sewer systems). In one respect this exercise should produce more precise and accurate results. However, it would lack transparency because it would involve calculations over which third parties have little, if any, visibility. Further, as with any "bottom-up" cost analysis there may be a risk of "errors of exclusion" which might lead to an under-estimate of the costs we avoid by not serving the site.

[26] See Guidance, page 20, footnote 10.

3. An alternative approach is to carry out a "top down" analysis, making as much use as possible of published sources including company accounts and information set out in the "Annual Performance Report" that we are required by Ofwat to publish each year. So, for example, in 2017/18 treated water distribution operating expenditure excluding power-related items, [27] infrastructure renewals (addressed in section 5.3.2 below), and rates (see section 6 below) was £61.510m,[28] equivalent to £1,601 per km of network (length of main being, we believe, the primary driver of water distribution operating expenditure). As with many "top-down" analyses, there is a risk that this figure is subject to "errors of inclusion". It includes, for example, manpower and other costs relating to the operation and maintenance of pumping stations, service reservoirs, and the larger diameter "upstream" sections of the network, and will therefore overstate average AWS expenditure on local NAV-type networks. Clearly, if this figure is used for the calculation of NAV tariffs it will benefit the NAVs to the detriment of AWS, but it does have the advantage that it can be directly derived from published accounting information.

4. A third option could involve modifying the simple top-down approach with reference to summary management accounting information that we use to prepare the published accounts. For example, we could take out expenditures associated with the operation and maintenance of service reservoirs and pumping stations, thereby arriving at a more "pure" estimate of network expenditure for our region. This would bring about a fairer result, but at the expense of a degree of transparency.

5. Once the choice of methodology has been made, there is a further issue to be addressed, namely how the avoided on-site ongoing costs should be expressed for the purposes of the tariff. The possible choices are:

- per km of on-site network, given that length of main/sewer is considered to be the primary cost driver for non-power-related distribution opex;
- per m^3 of water consumption; or
- per connection.

6. We believe that the first option can be considered to be the one that most closely reflects underlying costs. However, it would introduce two new "charge multipliers" into the NAV tariff, namely length of main and length of sewer, which would in turn require some disclosure and verification of the relevant information from the NAVs. [29] The second option could be a reasonable alternative if there were thought to be a strong correlation between on-site volume and the size of the local network, but we have doubts as to whether the relationship would be very close. Similarly, expressing on-site ongoing costs on a per connection basis could be

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[27] Power costs in water distribution relate to booster pumping stations, which are upstream of NAV sites and are therefore not relevant to an estimate of what AWS expenditures would have been on such sites.

[28] Source: Anglian Water 2018 Annual Performance Report, page 104.

[29] This is on the presumption that the NAV's network is the same as the network that would have been laid had we served the site. There may be circumstances where the two might be considered to be different.

reasonable if the length of main per connection were thought to be fairly consistent from one NAV site to another. Our view is that this is likely to be the case, given that the NAV sites in our area are all predominantly developments of new housing, built broadly with the same available technologies and developed under the same planning laws. Expressing on-site ongoing costs on this basis would give rise to some limited cross-subsidies between NAVs with slightly more or less densely populated areas, but this option has the advantage that it does not add any new charge multipliers into the NAV tariff algorithm, since the number of connections is already required for the application of wholesale fixed charges.

7. Our preferred approach to this element of the "minus" calculation is as follows: we propose to use a "top-down" methodology using information from the Annual Performance Report to arrive at an average cost per length of main, and to express this on a per connection basis. Experience from the modern developments that we serve indicates that 7.7m of water main, 5.4m of foul sewer, and (where applicable) 5.4m of surface water sewer per connection are appropriate benchmarks. We acknowledge that some sites may need to have longer lengths of main or sewer per connection but this is offset by the fact that, in any event, the top down approach provides an over-estimate of what it would have cost us to run the NAV sites and therefore favours NAVs as a group.

8. For 2018/19 this element of the tariff would be as follows:

- for water supply the latest evidence of on-site ongoing costs gives a figure of £1,601 per km of main in 2017/18. Using the average of 7.7m of main per connection, and inflating the costs using the annual increase in RPI to November 2017 of 3.9%[30] gives a total of **£12.81** per connection;

- for wastewater, separate calculations using the same approach are made for each of foul sewage, surface water, and highway drainage. Excluding expenditure on power and infrastructure renewals, in 2017/18 foul sewerage operating costs were £36.642m, equivalent to £0.762 per metre of foul sewer in 2018/19 prices. With an average of 5.4m of foul sewer per connection this amounts to **£4.28** per connection in 2018/19 prices. Operating costs on the same basis for surface water drainage were £15.535m, equivalent to £0.533 per metre of sewer, or **£2.99** per connection in 2018/19 prices. The corresponding figures for highway drainage were £7.128m, giving £0.245 per metre or **£1.37** per connection.[31] This gives a **total for a full wastewater service of £8.64** per connection.

[30] See section 8 below for a discussion of the use of indexation for components of the NAV tariff.

[31] The source for cost information is 2017/18 Annual Performance Report Table 4E. The lengths of sewer used in these calculations are 48,080.197km for foul sewers and 29,139.466km for surface and highway drainage sewers. This information is based on table 4R of the 2017/18 Annual Performance Report.

Questions for Consultation

Q10. Do you support our proposal to use published data to derive the ongoing on-site cost element of NAV tariffs? If not, please explain why, and what alternative you would prefer.

Q11. Do you agree that the ongoing on-site cost element of the tariff should be expressed on a common per-connection basis for all NAV sites? If not, what alternative would you prefer?

Q12. Do you have any comments on the indicative calculations for on-site ongoing costs for 2018/19?

5.3.2 Replacing On-site Assets Over The Long Term

1. The expenditure that we would have incurred on replacing assets over the long term had we served a NAV site cannot, by definition, be measured. Our challenge, therefore, is to prepare a reasonable and objective basis for calculating this element of the "minus". In the Guidance Ofwat suggests the use of an "equivalent annuity" to deal with the fact that expenditures are typically likely to occur in the relatively distant future[32] and this is the broad approach that we adopt here.

2. As with other elements of the NAV tariff, we are confronted with trade-offs between precision and complexity on the one hand and simplicity and transparency on the other. In particular, there is a choice to be made between carrying out a bespoke calculation for each individual NAV site, taking into account its specific characteristics, and preparing generic calculations that can be expressed on a simple per connection or per kilometre basis.

3. In general, we do not favour site-by-site assessments of hypothetical future capital replacement needs. This would involve considerable work on our part and significant information provision on the part of the NAVs. It would also open up the question of potential technical differences between the actual assets on site, which will have been a matter for the NAV and its developers, and the assets that would have been in place had AWS served the site.[33]

4. Accordingly, we propose to prepare a set of generic calculations to produce estimates of the cost of replacing the on-site assets over a long period that can be applied to all NAV sites. We accept that this approach may lead to a degree of imprecision in some circumstances (which mainly operates in NAVs' favour), but we think this should be limited, and is outweighed by the significant transparency that this approach would offer.

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[32] See Guidance, page 20.

[33] For example, companies may choose different types/makes of meter.

Question for Consultation

Q13. Do you consider that a generic approach for capital replacement is preferable to carrying out site-by-site assessments of hypothetical future capital investment needs?

5. As Ofwat noted in the Guidance, the networks on NAV sites are typically quite new, and are therefore unlikely to require significant capital expenditure on replacement for some years. This implies that our calculation of this element of the "minus" would reflect a "replacement holiday", with the beginning of a programme of hypothetical capital replacement works not due to take place for many years.

6. Given our preference for a generic approach to capital replacement costs, this implies the application of a common set of assumptions for the hypothetical duration of the replacement holiday. It would be unrealistic to expect there to be no replacement expenditure on each type of asset until the expiry of its expected asset life. Equally, since NAV networks are all but brand new, it would not make sense to assume a zero replacement holiday. We think a reasonable compromise between these two positions is to assume replacement holidays equal to about one third of expected average asset life.

Question for Consultation

Q14. Do you support our proposal to apply a common set of assumptions for the duration of capital replacement "holidays" so that this element of NAV tariffs can be the same for all sites?

Q15. Do you agree that it is reasonable to set the replacement holiday for each type of asset at one third of the expected asset life?

7. The methodology that we propose to apply to estimate an annualised value for hypothetical capital replacement costs involves the following steps:

- identify the different categories of asset that comprise typical sites that might be operated by NAVs;
- express the quantum of each asset type on a per property basis for a typical site;
- prepare assumptions, for each asset type, for the profile of hypothetical future replacement. For these purposes we assume that, conceptually, one tenth of an asset with a ten year asset life would be replaced each year, one hundredth of an asset with a 100 year asset life would be replaced each year, and so forth;
- apply company information for standard unit costs for capital replacement, making assumptions about the rate of future efficiency improvements;
- project future incremental RCV associated with capital replacement activity, rolling it forward to account for subsequent depreciation (using the same asset life assumptions as above). We use this "regulatory accounting"

approach for future capital replacement expenditure in order to enable the higher rate of return that Ofwat considers should be earned by NAVs (see section 6.1 below) to be reflected in our calculations;

- calculate the WACC on the RCV associated with the capital replacement based on the relevant rate of return (see section 6.1 below);
- calculate the avoided rates liability for future capital replacement expenditure (see section 6.4 below); and
- calculate the annualised value for each asset type that would, over the 240 year period, have the same net present value as the future stream of returns on "capital replacement RCV", depreciation, rates, plus the "terminal value" of that RCV at the end of the 240 year period. Note that, for the purposes of calculating the net present value and consequent annuity, we use the wholesale WACC allowed by Ofwat at PR14 of 3.6%: although the in-year returns on RCV attract the higher figure of 4.74%, the lower rate is used for the "time value of money" because that is how cash in different time periods would otherwise be valued in the industry by Ofwat and others.

8. We have identified seven asset categories – four for water and three for wastewater – and estimated how much of each would typically be used on new developments on a per connection basis. We have drawn on our latest cost experience to derive unit costs for each category. This information, together with assumptions on the future replacement profile of each asset category, has been used to generate annualised values that, over the long term, will cover the capital replacement programmes for each type of asset.

9. These calculations can be illustrated using the asset category that produces the largest annuity, namely customer meters. The asset life of meters is 12 years, so the "replacement holiday" is 4 years. The current unit cost for meter replacement is £95, which is projected to fall by 1% per annum in future in line with assumed efficiency improvements. See table overleaf.

Illustration of Forward-Looking Calculations Used to Prepare Capital Replacement Annuities									
	Unit cost	Replacement expenditure (per connection)	Depreciation	Incremental RCV created			Return on RCV @ 4.74%	Rates @ 1.43%	Total (return plus dep'n plus rates)
				Opening	Closing	Year Average			
Year 1	£95.00	-	-	-	-	-	-	-	-
Year 2	£94.05	-	-	-	-	-	-	-	-
Year 3	£93.11	-	-	-	-	-	-	-	-
Year 4	£92.18	-	-	-		-	-	-	-
Year 5	£91.26	£7.60	-	-	£7.60	-	-	-	-
Year 6	£90.34	£7.53	£0.63	£7.60	£14.50	£11.05	£0.52	£0.16	£1.32
Year 7	£89.44	£7.45	£1.26	£14.50	£20.69	£17.60	£0.83	£0.25	£2.35
Year 8	£88.55	£7.38	£1.88	£20.69	£26.19	£23.44	£1.11	£0.34	£3.33
Year 9	£87.66	£7.31	£2.50	£26.19	£31.00	£28.59	£1.36	£0.41	£4.26
Year 10	£86.78	£7.23	£3.11	£31.00	£35.12	£33.06	£1.57	£0.47	£5.15
Year 11	£85.92	£7.16	£3.71	£35.12	£38.57	£36.85	£1.75	£0.53	£5.98
Year 12	£85.06	£7.09	£4.31	£38.57	£41.36	£39.97	£1.89	£0.57	£6.77
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

[1] All figures expressed are in real terms (2017/18 prices)

10. The projections of incremental RCV created for meter replacement are made over 240 years, and the resulting depreciation, return on capital, and rates costs are discounted at 3.60% to produce a net present value of £159.14. This, in turn, yields an annuity of £5.73 per annum for meter replacement, which then forms part of the "minus" calculation.

11. The same calculations are produced for each of the other six categories of on-site asset, and the results for all seven can be summarised as follows.

Asset	Asset life	Replacement Holiday	Replacement Annuity
Meter	12	4	£5.73
Meter box	40	14	£6.91
Water main	120	40	£2.21
Communication pipe	120	40	£1.11
Foul water sewer	160	50	£2.35
Surface water sewer	160	50	£2.35
Lateral	160	50	£2.18

A notable feature of these results is that the annuity for meters and the meter box are somewhat higher than those for the other assets. This is due to the fact that although these assets may be thought of as being much less expensive, the much longer replacement holidays and the power of discounting means that the annuities for the underground assets are somewhat lower by comparison.

12. These calculations produce a total of **£15.96** per property for water supply and **£6.88** per property for wastewater.

Question for Consultation

Q16. Please provide comments on our proposed methodology to give effect to the generic approach to calculating the avoided capital replacement costs, providing alternative suggestions where applicable. In particular:

a) do you agree with our identification of asset categories; is anything missing?
b) do you support our assumptions on asset lives?
c) do you have any comments on our proposed approach to unit costing and efficiency projections?
d) do you agree with our use of the NAV-specific WACC proposed by Ofwat in the Guidance for the projected return on RCV, and the wholesale WACC used by Ofwat at PR14 to convert future values into an ongoing annuity?

6. The Return on Capital on On-site Assets, and Local Authority Rates

1. This section deals with the initial up-front investment in a site, the return it earns and the expenditure on local authority rates to which it gives rise.

2. There are two elements to the calculation of the return on capital on on-site assets that AWS would have earned had an inset appointment not been made: the relevant real rate of return to be assumed, and the asset value to which it is to be applied. These are dealt with in turn.

6.1 The Choice of Rate of Return

1. For the purposes of the Guidance Ofwat has decided that the relevant rate of return should be the real weighted average cost of capital (WACC) allowed at the last regulatory price review in 2014, adjusted "*to reflect the fact that the incumbent water companies enjoy a degree of regulatory protection*" and "*to reflect the risks of the relevant on-site activities*".[34] Appendix 2 of the Guidance sets out Ofwat's proposed calculations and arrives at a figure of 4.74% (fully pre-tax), compared with the 3.94% on the same basis that it says was allowed to existing undertakers at the 2014 price review.

2. For the avoidance of doubt, we do not fully support Ofwat's reasoning in proposing that a higher rate of return be used. It means, in effect, that NAVs are being allowed a higher margin between our NAV tariff and our end-user charges than we would have been allowed, the extra cost ultimately being borne by the generality of our other wholesale customers. However, given that we have identified full compliance with the Guidance as a primary objective (see section 2 above), we have used the 4.74% figure in the calculation of our NAV tariffs. As and when Ofwat determines a new cost of capital for the sector, this figure will be correspondingly adjusted (see section 9 below), but for the remainder of AMP6 we propose to adopt the required 4.74%.

6.2 To What Capital Base is the Rate of Return to be Applied?

1. The Guidance requires us to make an assessment of what regulatory capital value (RCV) would have been created in the hypothetical circumstances in which the inset appointment was not made. The identification of that RCV is not straightforward because it is inextricably bound up in the provisions for the financing of new development which have recently been changed and are expected to do so again in 2020 (see below).

   "The WACC estimated in Annex 2 should be applied to the Regulatory Capital Value (RCV) which is related to the on-site assets. To the extent that the incumbent water company accrued the on-site assets to its RCV, if it undertook the development instead of a NAV, the WACC should be applied to the same type and value of assets" [35]

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[34] See Guidance, page 21.

[35] See Guidance, page 22.

2. In simple terms, under the RCV methodology used by Ofwat for setting price controls, in the hypothetical situation in which an inset is not awarded, the increment to RCV is equal to "net capital expenditure" for the site in question, which in turn is equal to the gross capital expenditure for the site *less* the capital contributions made by developers.[36] Importantly, this means that where an asset that is fully funded by a developer is acquired by an undertaker it has no impact on the RCV, because the gross capital expenditure is fully offset by the capital contribution. As described in section 5 above, when an undertaker comes to replace on-site assets in the future, incremental RCV may be created then, and the calculations presented in section 5.3.2 show how this is reflected in the "minus".

3. For the purposes of determining the initial capital base to which the WACC should be applied, it is useful to distinguish between three categories of NAV, depending on the date on which the appointment is made. Each is explored in the following sub-sections.

6.2.1 "Legacy" NAV sites

1. Until recently (1st April 2018) the level of financial contribution from developers to new development expenditure was determined by statutory provisions in the following way. A developer had the right to serve a "requisition notice" on the undertaker, requiring that it provide the mains (or sewers) to serve a new site. In return, the developer was liable to meet the costs of the requisition either by paying:

- the "relevant deficit", defined as the amount by which the financing costs (interest plus repayment) of the capital investment over a 12-year period (assuming equal annual instalments), exceed the expected income from the customers in the new development in each of those twelve years; or

- a "commuted sum", being the net present value of the above, taking an agreed forecast for the income from the customers.

2. Clearly the two were equivalent ways of achieving the same end: developers would pay for the asset(s) in question, but would get a "discount" to reflect the value to the undertaker of the income stream from the newly-connected customers over the twelve-year period. This "credit" is often referred to as the "income offset". [37]

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[36] At PR14 Ofwat changed its methodology for determining price/revenue controls. Whereas previously operating costs were recovered 100% from customers in the year, all capex was added to the RCV, and the RCV was reduced by current cost depreciation, it has now adopted a more flexible formulation. A portion of total expenditure (totex) is added to the RCV (1 minus the "pay as you go" rate) and a separate "run-off rate" determines the amount by which it is effectively amortised each year. However, it is acknowledged that there is a "natural rate" for each of "pay as you go" and "run off" that reflects the "economic substance" of the expenditures and cost recovery decisions being undertaken. In general companies would be expected to adhere to those "natural rates" over time, implying that net RCV growth would only occur where investors and creditors committed capital to the carrying out of new net capital expenditure. In other words, there is no fundamental difference between the pre-PR14 and post-PR14 price review methodologies: under the latter the relationship between net capex and RCV growth is implicit, whereas under the former it was explicit.

[37] Developers also had the right to have infrastructure provided by third party "self-lay operators". Where they chose this option for water supply the value of the credit that would have been made had the work been requisitioned from the undertaker was payable to the self-lay operator by means of an "asset payment".

3. As noted above, the increment to the incumbent's RCV would have been equal to Net Capex, which can be expressed as:

$$\textit{Net Capex} = \textit{Gross Capex} - \textit{Developer Contribution} \quad (1)$$

4. Whether the developer chooses to pay in twelve instalments or opts to pay a "commuted sum", its contribution in NPV terms for assets that it has requisitioned is as follows:

$$\textit{PV Developer Contribution} = \textit{Gross Capex} - \textit{PV Income Offset} \quad (2)$$

5. Substituting (2) into (1) produces the following:

$$\textit{Net Capex} = \textit{Gross Capex} - (\textit{Gross Capex} - \textit{Income Offset})$$

$$= \textbf{\textit{Income Offset}}$$

6. In effect, then, the increment to the undertaker's RCV was simply equal to the value of the income from the newly-connected customers over the first twelve years of the development.[38]

7. Further, where new development assets are not requisitioned (or provided under the self-lay equivalent), there is no provision for allowing a "credit" based on the income offset. Therefore where, for example, a developer lays the entire sewerage network on a site and seeks to have it adopted by the undertaker there is no immediate impact on the RCV, even though the undertaker has acquired a set of new assets. As Ofwat puts it:

   "….developers pay for the costs of rolling-out the onsite network, connecting the latter to the local incumbent water company's nearby network and for any network reinforcement the latter needs to undertake. The upfront costs of these services are already recovered from developers and, therefore, should not be recovered from end-customers. They should, therefore, not be considered for the purpose of setting bulk charges."[39]

8. Importantly, since it is not common for the requisition option to be chosen by developers for wastewater networks, there is often no new development wastewater capital expenditure that finds its way into our RCV. In those circumstances this element of the "minus" calculation would therefore return a value of zero on the wastewater side. Further, since no assets would be added to the wastewater RCV the depreciation component of the "minus" calculation for sewerage would also be zero. However, where a requisition notice would have been served by the developer on AWS for wastewater networks, we will carry out a calculation to produce an estimate of the incremental RCV created in exactly the same way as for water supply.

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[38] Note, strictly speaking the income offset only comprises income up to the value of the annual instalment in each year.

[39] See Guidance, page 22.

9. Where our assessment of the hypothetical development financing that would have occurred is disputed by the NAV on the basis that its actual experience is different, it will need to provide evidence of its on-site investment (i.e. that not funded by the developer) by providing pipe-laying notices or self-lay agreements.

6.2.2 Future NAV Sites Post-2020

1. For NAVs that obtain a site post-April 2020 the value of the initial up-front net capex is zero. This is because, from that date, Ofwat's new rules for connection charges[40] require that income offset deductions are removed from the calculation of requisition charges and applied to infrastructure charges instead. Since the application of infrastructure charges is the same, whoever carries out on-site development and whether or not the site is subject to an inset appointment, this will automatically secure a more level playing field. For the purposes of this element of the calculation of bulk charges, since the developer will be required to fund 100% of on-site costs there will be no actual or hypothetical increment to the incumbent's RCV when a site is initially developed for this category of NAV site.

6.2.3 NAVs Appointed in the Meantime (2018 – 2020)

1. The third type of NAV covers those that will have been appointed in the interim, i.e. between the 1st April 2018 and 31st March 2020. The Guidance states that:

   "To benefit from a more even playing field as soon as possible, as a temporary measure, we have decided that incumbent water companies should include the payment of the 'income offset' in their new bulk agreements from 1 April 2018 to 31 March 2020."

2. In practice we have expressed a preference for providing the benefit of the income offset to NAVs by means of a reduction in the infrastructure charge (i.e. in line with Ofwat's intentions for the post-2020 period) rather than as an equivalent reduction in bulk charges, and this has generally been accepted by our NAV counterparts. Irrespective of which method is chosen, the NAVs in this category benefit from the value of the hypothetical income offset straight away. This is in contrast to the legacy NAVs for whom the benefit takes the form of a hypothetical change in our RCV which gives rise to avoided depreciation and return on capital that is included in the "minus" calculation. (Of course, as with the other two categories, RCV could have been created in the future as on-site assets were replaced, giving rise to a WACC and depreciation charge then, but this is covered separately in the generic calculations for the capital replacement "minus" in section 5.3.2 above.)

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[40] "New connections charges rules from April 2020 – England: Decision Document": Ofwat 2nd November 2017.

Question for Consultation

Q17. Are we right to conclude that the return on RCV and depreciation components of the "minus" calculation in the methodology set out in the Guidance are only relevant for the bulk charges for NAVs appointed before 1st April 2018 so far as up-front investment is concerned (as distinct from future capital replacement)? If you have a different view, please provide details of other NAVs to which you think these elements are applicable.

6.3 Assessing the Value of the Hypothetical "Income Offset"

1. For the "legacy" NAVs, the relevant question for the assessment of the value of the income offset is: what income would have been expected from the site in the first twelve years of its existence, how would this have compared with the annual instalments, and therefore what would have been the difference between the gross capital expenditure and the "commuted sum" had AWS served the site. This will have depended on what the expected programme for rolling out the site and connecting the new properties would have been at the time, together with the then expected level of household bills. Clearly this is likely to have been quite different from one site to another which means that this part of the NAV tariff cannot be common to all NAVs or sites. In other words, a case-by-case approach will have to be undertaken for the purposes of calculating NAV tariffs for these legacy sites, as any region-wide average approach would be likely to benefit some NAVs significantly and penalise others.

2. AWS has an established methodology for carrying out such calculations for developers. Where historical evidence is not available on the expected programme for rolling out the site the most straightforward approach is to assume that what would have been expected at the time is what has actually happened. In other words, we can invite NAVs to provide us with information on property numbers for each year of operation, together with averages for billed volumes. We can make simple projections for the remainder of the twelve year period and calculate what the income offset would have been at the time, had we served the site.

3. These principles can be illustrated using a water service example for the hypothetical NAV site that we have used throughout this paper. We assume that the development was commenced in 2010/11 at a gross capex cost of £750,000, and that the 1,000 household properties were completed at a rate of 200 per annum over the course of the following five years and likewise the 50 non-households were completed at a rate of 10 per annum over the same period.

Year	"Annual Instalment" @5.5% borrowing rate	Expected income from customers	Relevant deficit
2010/11	£87,022	£0	£87,022
2011/12	£87,022	£19,092	£67,930
2012/13	£87,022	£55,483	£31,538
2013/14	£87,022	£94,041	£0
Thereafter	£87,022	>£87,022	£0
NPV of relevant deficit (commuted sum)			£170,375
Gross capex			£750,000
Net capex (gross capex less developer contribution)			£579,625

4. In this example the income from prospective customers would have exceeded the annual instalment on the notional loan of £750,000 by the end of year 3, so from then on the developer's contribution would have been zero. Had it opted to pay a commuted sum that would have amounted to £170,375 in 2010/11, leaving net capex of £579,625 which would have been added to AWS' RCV as at the end of that financial year. However, this is not the exact RCV value that now needs to be reflected in the calculation for bulk charges, because it would have been subject to both depreciation and inflation in the meantime. This is the subject of section 7 below.

Question for Consultation

Q18. Do you agree with our proposed approach to:

a) the definition of the incremental RCV on which a return would have been earned;
b) the calculation of the income offset?

In each case, please indicate where you disagree and what alternative approach(es) you would propose.

6.4 Local Authority Rates

1. For accounting purposes rates are classified as part of operating costs. However, they are addressed in this section rather than section 5.3.1 because of the close relationship they bear to asset values and profitability.

6.4.1 Water Supply

1. For the vast majority of business, rates are based on the open market value of premises. Where open market evidence is not available, other methods can be applied. For water undertakers the Valuation Office applies the "Receipts and Expenditures" method, sometimes known as the "profits" method. This comprises the following basic methodological steps:

- work out the profitability of the network on an ongoing basis;
- take off the share (profit) that a hypothetical tenant would expect out of that profit (the "Tenant's share");
- the balance is the rent that a "landlord" of that network would expect.

2. Water undertakers therefore receive a rates bill for the whole of their business, ultimately related to its profitability. Under the regulatory regime within which they operate, profitability is, in essence, a function of the RCV on which a rate of return is earned. All else equal, then, if a new development has no effect on a water undertaker's RCV, it will have no effect on profitability, and no effect on the rates bill. It follows that the hypothetical rates costs that we would have incurred in respect of up-front on-site investment but for the appointment of a NAV are zero, except for the "legacy" NAVs referred to above.

3. For them, our proposed calculation of the "avoided" rates costs is relatively straightforward. In 2017/18 our total rates bill for water of £41.935m[41] represented the equivalent of 1.43% of year average water RCV of £2,937m[42]. For each £1 of RCV that we have foregone as a result of not serving the site, we can be said to have "avoided" 1.43p of hypothetical rates costs. The resulting effect of rates on the NAV tariff for legacy sites is illustrated in section 7.2 below.

4. For all NAVs, however, an avoided rates liability does arise in relation to future capital replacement expenditure, as described in section 5.3.2 above. We have examined those projections using a regulatory accounting approach, which gives rise to a profit element on net incremental RCV, which would in principle have an effect on the rates bill. Accordingly, the future RCV associated with capital replacement expenditure attracts both a WACC return of 4.74% and a rates liability at 1.43% of net value.

6.4.2 Wastewater

1. For wastewater, no rates are payable on sewers. Only above-ground assets attract local authority rates. There are therefore no rates costs that we avoid as a result of not serving a site, and no element needs to be allowed for in the NAV tariffs for wastewater.

Question for Consultation

Q19. Do you agree with our analysis of the derivation of "avoided rates costs"? If not, please explain what alternative approach you think is appropriate.

[41] Source: 2017/18 Annual Performance Report, table 4D.

[42] Source: Ofwat update of RCVs - https://www.ofwat.gov.uk/publication/regulatory-capital-values-2018/

7. Depreciation

1. This section deals with the depreciation on the initial up-front investment in a site. Depreciation on capital replacement is examined in section 5.

7.1 Overview

1. The final component of the "minus" calculation is depreciation. As with other elements of the methodology set out in the Guidance it is important to be clear at the outset precisely what assets should be included in the depreciation calculation. The Guidance states:

   "To the extent that the incumbent water company accrued the on-site assets to its RCV, if it undertook the development instead of a NAV, depreciation of onsite assets should be included in the costs to be deducted."[43]

2. The question of what would have been added up front to the incumbent's RCV was addressed in section 6 above. The task of translating this into a hypothetical depreciation profile is addressed below.

3. As with the return on capital, this category of costs only applies to "legacy" NAVs (and generally only for water supply.)[44] For future developments developers will receive no credit against their requisition charges for the "income offset", so no upfront net capital expenditure will accrue to an incumbent's RCV.

7.2 Depreciating the "Income Offset"

1. As with the calculation of the asset value described in section 6 above, we believe it is clear that the assessment of depreciation for legacy NAV sites will have to be addressed on a site-by-site basis because of the potential for wide differences between one site and another. In carrying out the necessary bespoke calculations two methodological issues arise.

2. First, what depreciation policy should be applied to the income offset "asset"? Our preference is simple straight line depreciation because that is the default approach that has been used by AWS and by the industry more widely. In addition, since RCV is indexed and the return is based on a real weighted average cost of capital, a current cost depreciation approach would appear to be appropriate.

3. Second, what asset life should be assumed for the depreciation calculation? Using water mains as an example, on the basis these are the subject of a requisition and they have an assumed asset life of 120 years, we consider this to be the appropriate period for depreciating the income offset.

4. The effect of these proposals is illustrated in the following calculations for our hypothetical NAV site.

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[43] See Guidance, page 22.

[44] Although developers usually prefer to have sewer networks adopted by the undertaker, requisitions are occasionally used.

	March RPI	Opening RCV 1st April £	Closing RCV 31st March £	Year average RCV £	Dep'n £	Index'n £	Return @ 4.74% £	Rates @ 1.43% £
2010/11	232.5		579,625					
2011/12	240.8	579,625	595,486		4,830	20,692		
2012/13	248.7	595,486	610,019		5,004	19,536		
2013/14	254.8	610,019	619,811		5,170	14,962		
2014/15	257.1	619,811	620,108		5,298	5,595		
2015/16	261.1	620,108	624,410		5,346	9,648		
2016/17	269.3	624,410	638,591		5,430	19,610		
2017/18	278.3	638,591	654,331		5,602	21,342		
2018/19	288.0*	654,331	671,442	662,886	**5,791**	22,902	**31,421**	**9,479**

* Forecast RPI for March 2019

5. Each year depreciation is calculated off the opening RCV, which is adjusted upwards for inflation and downwards for depreciation. The return on RCV in 2018/19 is calculated using "year average" RCV, as is the rates component. This yields a total "minus" from these three elements in 2018/19 for our illustrative "legacy" NAV of £46,691.

6. In subsequent years the calculations would simply be rolled forward using the same methodology until the legacy RCV depreciated to zero after 120 years.

Question for Consultation

Q20. What are your views on our proposed approach to the depreciation policy to be applied to the net capex that would have been added to our RCV at the time a site was developed, including the asset life assumption?

Q21. Do you have any comments on the "rolling RCV" calculations that we have set out, and the way that we propose to derive the return on capital, depreciation, and rates elements of the "minus"?

8. The Proposed Form of the Tariff and How it could be Applied

8.1 Recap

1. The proposals presented in sections 3-7 above would provide the required elements of the NAV tariff, in line with the Guidance. The following table summarises the information required to apply the tariff. We distinguish between the requirement for actual figures and hypothetical ones, but acknowledge that in many cases these are likely to come to the same thing (e.g. number of meters).

Component	Information required
Wholesale charge start point	AWS published wholesale charges Actual number of households Actual average consumption of households Actual number of non-households Actual average consumption of non-households
Adjustment to measured volumes for leakage	Hypothetical on-site leakage rate
Cost of operating and monitoring the network	Actual number of connections
Cost of replacing on-site assets over the long term	Actual number of connections
Rate of return on hypothetical RCV	Hypothetical "DADs" calculation Price Index Series WACC
Depreciation on hypothetical RCV	As above, asset life assumption

8.2 Illustration of NAV tariff

1. The above information can, as a practical matter, be used so as to enable the NAV tariff to be expressed as a conventional two-part tariff. The following presents the calculations for water supply that would be necessary to do this for our illustrative NAV in 2018/19.

"Relevant Starting Point"

Fixed charge (per annum)	£6000.00
Weighted average volumetric charge (£ per m^3)	£1.4934

Value of "minus" components	**Cost per connection**	**No of connections**	**Total**
Ongoing on-site costs	£12.81	1,050	£13,450.50
Replacement of on-site assets	£15.96	1,050	£16,758.00
Return on RCV			£31,421.00
Depreciation			£5,791.00
Rates			£9,479.00
Total			**£76,899.50**

Chargeable volumes[45]	112,500m^3
Adjustment to volumetric charge £ per m^3	£0.6836

Final Bulk Charge for 2018/19

Fixed charge (per annum)	£6000.00
Volumetric charge £ per m^3	£0.8099

2. Note that, in the above example, the "minus" elements have all been expressed as deductions to the wholesale volumetric rate as opposed to the fixed element of the charge. There is no intrinsic reason for this: they might just as well have been expressed as deductions to the fixed charge, or a combination of the two. However, since the vast bulk of wholesale revenue is volumetric, making deductions from the fixed charge could, technically, create negative fixed charges, distorting the optics of the charge.

8.3 Prospective versus Retrospective

1. As noted in section 3 earlier, it is immediately evident from the illustrative calculation above that a two-part tariff that is calculated in advance of the Charging Year will inevitably depend on forecasts that will never turn out to

[45] After making the adjustment for hypothetical on-site network losses.

be quite right. In particular, the level and mix of volumes and customers (i.e. charge multipliers) on a given NAV site are likely to deviate from projections.

2. There are essentially two ways of dealing with this issue in relation to the "charge multipliers". One possibility is to calculate the prospective tariff in each year using best available forecasts, and leaving it at that. As a result of subsequent deviations from forecast either the NAV or AWS would be better off, and the other would be worse off. Provided forecasting errors were random, the gains and losses could be expected to balance each other out over time.

3. There are two potential difficulties with this approach: one, it puts the onus on the parties to examine the forecasts carefully and to satisfy themselves that they are as accurate as possible. The other is that it relies on agreement being reached on matters than cannot, at the time, be proved either way.

4. We therefore propose the other option, which is to carry out a retrospective "true-up" after the Charging Year in order to re-state the charges for the 12 month period and calculate any refunds or back-charges due. Since NAVs have to complete the "Small Company Return" for Ofwat anyway which includes details of customer numbers and volumes, the necessary data is available in an official form.

Question for Consultation

Q22. What are your views on the proposal to apply a retrospective "true-up" as part of the application of NAV tariffs so that the effective price paid by the NAVs at each site is correct?

5. On our preferred basis that a retrospective true-up should take place, further questions arise regarding the process for setting the tariff to be applied "*pro tem"* in advance of the start of each Charging Year. Clearly it could be argued to some extent that the precise level of the provisional tariff to be used during the Charging Year does not matter very much, given that the "right price" will end up being applied retrospectively in the end.

6. There are different approaches that could be used to determine the provisional tariff. A "high level" option could involve, say, applying the tariff from the previous year adjusted either for inflation or for "RPI +/- K".[46] The advantage of this is that it would be transparent and simple. The alternative is a full calculation such as that set out above could be undertaken using forecast information. The advantage of this is that it should give rise to smaller adjustments when the retrospective true-up is carried out.

7. On balance, we favour the latter approach. It should be possible to prepare reasonable forecasts of customer numbers, etc., in advance, and although these are subject to variances due to unforeseen events (e.g. extreme

[46] This is the formula used for the wholesale revenue controls in condition B of our Instrument of Appointment. K is a factor that may be positive or negative or zero. RPI is expected to be replaced by CPIH from 1st April 2020.

weather) it should be possible in most years to reach a fairly accurate result that does not create the need for a significant retrospective adjustment either way. By setting out the calculation in detail, it would also be possible to show which elements would be subject to revision and which would not, thereby providing the NAV with an additional degree of certainty regarding the final result.

8. This implies that the published form of the NAV tariffs, which we propose to incorporate in a schedule to be made available roughly at the same time as our wholesale charges in early January of each year, would look something like the following (see over):

Water Supply NAV Tariff

For the charging year (or pro rata for a part thereof):

- a fixed charge of £5.65 per household connection;
- a fixed charge of £7.00 per non-household connection;
- a volumetric charge to be calculated as a weighted average of a household rate of 151.81p per m3 and a non-household rate of 129.59p per m3, the weights to be provided by the NAV, applied to the volumes recorded on the bulk meter less an allowance of 2.16% for leakage and other unbilled volumes;

less

- £12.81 per connection in relation to avoided on-site ongoing operating costs;
- £15.96 per connection in relation to avoided on-site future capital replacement costs; and
- for legacy NAVs only, a site-specific amount representing the WACC and depreciation on the on-site assets that would have accrued to our RCV, as well as the local authority rates that would have been payable in relation to the site.

Wastewater NAV Tariff

For the charging year (or pro rata for a part thereof):

- a fixed charge of £31.10 per household connection for foul water only;
- a fixed charge of £65.10 per household connection for foul and surface water;
- a fixed charge of £45.00 per non-household connection for foul water only;
- a fixed charge of £80.00 per non-household connection for foul and surface water;
- a volumetric charge to be calculated as a weighted average of a household rate of 168.64p per m3 and a non-household rate of 157.85p per m3, the weights to be provided by the NAV, applied to the volumes charged for water supply multiplied by the applicable return-to-sewer rate;

less

- £8.64 per connection in relation to avoided on-site ongoing operating costs; and
- £6.88 per connection per connection in relation to avoided on-site future capital replacement costs.

less

- for legacy NAVs where a requisition notice would have been served had AWS served the site instead, applicable WACC and depreciation estimate on the hypothetical RCV that would have been created.

Question for Consultation

Q23. Do you agree that we should aim to set provisional tariffs that are based on the best available forecasts for the relevant Charging Year?

9. Finally, for the avoidance of doubt, we are not proposing to re-state the avoided cost estimates for each Charging Year after the event, i.e. to reflect the out-turn values that are presented in the Annual Performance Report. For example, the ongoing on-site cost element of the tariff for 2019/20 would be calculated as the APR-generated estimate of avoided cost for 2017/18 in accordance with the discussion in section 5 above, adjusted for two years' worth of inflation using the conventional approach established in the industry.[47] This would also apply to the generic estimates for the cost of replacing on-site assets discussed in the same section.

10. For the legacy NAV sites we are, however, proposing to re-state the "rolling RCV" calculation retrospectively using out-turn price index information. The corrected numbers for opening and closing RCV have to be calculated anyway because they feed into the relevant elements of the "minus" calculation for subsequent years, so the making of a retrospective correction at the end of each Charging Year involves no additional information and should be comparatively straightforward.

8.4 Summary of Proposed Process for Applying NAV Tariffs

1. The proposals set out in this section and in earlier parts of this document regarding the process for applying the NAV tariffs can be summarised as follows (see over).

[47] This uses the increase in RPI to the November immediately preceding the start of the Charging Year. So for 2019/20 the 2017/18 avoided cost elements would be inflated by the movement in RPI between November 2016 and November 2018. This use of a lagged RPI does mean that the indexation used to calculate prices may deviate from actual inflation in the year itself, but the variances can be expected to even themselves out over a period of years. In addition, both the wholesale charges themselves, and the end-user charges faced by customers, are derived using the November RPI convention.

Task	Carried out by	For what
Before the start of the Charging Year		
Prepare wholesale tariffs	AWS	The "Relevant Start Point"
Provide forecasts of charge multipliers for the forthcoming year	NAV	To calculate the aggregate fixed charge and the weighted average volumetric charge to be used in the provisional tariff for billing purposes during the course of the year. Also needed for the "per property" elements of the minus calculation (ongoing on-site costs and capital replacement costs)
Calculate avoided ongoing on-site costs using data from the APR for the previous year using the approach set out in section 5.3.1, and adjust for two years' inflation up to November immediately preceding Charging Year	AWS	To calculate the ongoing on-site cost element of the "minus" calculation.
Roll forward capital replacement annuity values from prior year figures using one year's price inflation up to November immediately preceding Charging Year	AWS	To calculate the capital replacement cost element of the "minus" calculation.
Prepare forecast of price indices for the coming March and the following March	AWS	To calculate the forecast RCV values for the coming year, and therefore the WACC, depreciation, and rates components (legacy NAVs only).
Publish generic components of NAV tariff, and communicate site-specific elements to relevant legacy NAVs	AWS	To provide the basis for billing during the course of the Charging Year
After the end of the Charging Year		
Provide out-turn information on charge multipliers	NAV	Enables the correct aggregate fixed charge and weighted average volumetric charge to be calculated, and provides information to which the "per property" "minus" elements can be applied.
Prepare calculation of out-turn RCV values using actual figures for March price indices	AWS	Provides correct figures for depreciation, return on capital, and rates.
Prepare final statement of charges	AWS	Supports the calculation of any outstanding balance or refund due for the Charging Year.

Question for Consultation

Q24. Do you have any comments on the proposed process for calculating provisional NAV tariffs in advance of the relevant Charging Year, and carrying out the "true-up" after the end of the Charging Year?

9. Dealing with Future Changes

1. This section addresses the general question of how we accommodate future developments, both anticipated and unanticipated, which could have a bearing on the methodology that we have presented in this consultation paper. Ofwat stated that it wanted the Guidance to be "future-proof"[48] and has built a degree of flexibility into it.

2. It will be up to us to work out how we modify our calculations in response to future developments that have a bearing on the calculation of NAV tariffs. In general, we intend to respond to change by modifying our NAV tariffs in a way that adheres as closely as possible to both the spirit and the letter of the Guidance. So, for example, there are known changes in data that we will reflect in updated calculations for the NAV tariff from time to time. These include:

- changes in our cost structure, which in turn will automatically lead to a re-evaluation of hypothetical ongoing on-site costs;
- changes in our unit capital costs, which will lead to changes in our estimate of the future costs of replacing assets on the on-site network; and
- revisions to our assessment of how much leakage would have been lost on the NAV site had it been served by us. Significant changes in our leakage performance are expected over the coming years, which could affect our assessment of the leakage abatement adjustment discussed in section 4 above.

3. For any such changes we intend to achieve transparency by signalling them well in advance, and consulting if necessary.

4. There will be known changes external to us that will also have an impact on the NAV tariff calculation. For example, Ofwat has signalled that at the forthcoming price review it intends to set a lower allowed cost of capital. Using the approach set out by Ofwat in the Guidance we will re-calculate the rate to be allowed on the hypothetical RCV that would have been created had we served the site instead of the NAV.

5. Similarly, Ofwat has decided that the basis of indexation for the sector will change from 1st April 2020. RPI will be replaced in full by CPIH[49] for the purposes of indexing revenue controls. For the existing RCV as at 1st April 2020 future indexation will be an equal weighted average of RPI and CPIH until the following price review. These changes will be built into our calculations for the 2020/21 charging year and thereafter.

6. As well as changes such as these that we can anticipate, there could be other developments that are not so easy to foresee. These could include regulatory changes or modifications of the law governing the industry (e.g. a future change in the law on the financing of new development). Of course, by definition we cannot anticipate these so we cannot give specific details of

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[48] See Guidance: page 14.

[49] Consumer Price Index including Owner Occupiers' Housing Costs

how we would respond. We can, however, commit to responding to any such developments in a way that is consistent with the core principle of the Guidance, namely to secure and maintain a level playing field between ourselves and NAVs for the delivery of water and wastewater services to new developments.

Question for Consultation

Q25. Do you have any comments on our proposed approach to dealing with future regulatory and other changes? Please indicate if there are any additional points you think we should consider.

10. Applying New Tariffs to Existing NAVs

1. As noted in the introduction, Ofwat makes clear in the Guidance that it would like to see the charges to existing NAVs brought into line with new NAV tariffs:

   "…we expect that in most cases when this guidance comes into force the incumbent water companies will have to create and publish new bulk supply charges. These will supersede existing agreements between the incumbent water companies and the NAVs and prompt a number of changes. It would be good practice for incumbent water companies to take the initiative and update the bulk supply charges with their existing NAVs to reflect such changes, but in any case they should do so promptly when an existing NAV requests the bulk charges to be updated to reflect this guidance".[50]

2. Our existing bulk agreements with NAVs contain bespoke pricing arrangements that were negotiated when the NAVs were awarded. We are keen to fall into line with good practice, as set out in the Guidance, so our preferred approach is to backdate the application of the new NAV tariffs to 8th May 2018, the date of its publication, once they are finalised. We acknowledge, however, that other options are available, for example:

- the new tariffs could come into effect for existing NAVs from 1st April 2019, the beginning of the first full Charging Year after the publication of the Guidance; or
- the new tariffs could be phased in over a specified period, e.g. 3 years.

Question for Consultation

Q26. Do you agree that new NAV tariffs should be backdated to 8th May 2018 for existing NAVs? If not, please explain what alternative approach you propose.

[50] See Guidance: p25.