1. NORTHUMBRIAN WATER RESPONSE TO REPLIES TO CMA PD ON BASE COSTS

1. This note provides limited comments on other submissions made to the CMA with respect to base costs modelling within the CMA's Provisional Determination (**PD**):[1]

- Section 2 sets out common concerns over the scale of the reduction in base cost allowances and the impacts that these will have on the sector;
- Section 3 covers the flaws identified by the main parties in the LASSO approach where there is a high degree of overlap around lack of robustness;
- Section 4 points out that the modifications to the CMA's LASSO approach suggested by Southern and South East do not address the flaws that have been identified; and
- Section 5 reinforces the need for further engagement between the CMA and the main parties in this space ahead of the CMA's Final Determination (**FD**).

2. THE SCALE OF THE REDUCTION IN BASE COST ALLOWANCES IS LIKELY TO HAVE REAL WORLD CONSEQUENCES

2. We were clear in our response that the scale of the challenge presented by the CMA's provisional position on base modelled allowances is implausible.[2] This position is echoed by many others.[3] We note that the errors identified in the CMA's models made the task of commenting on the PD more challenging, as it is not clear if the CMA would have taken the same decision once the error is corrected – or if it would have accepted that a £3.4bn reduction in sector allowances was unreasonable.

3. Ofwat states that the PD base cost allowance is 3.8% lower than FD24.[4] This is misleading as it includes unmodelled costs over which companies have no control and it does not appear to take account of the error in the CMA's code. Once corrected, as a percentage of modelled costs, it is an 8% reduction from FD24.[5] We do not think this can be described as "broadly aligned with [the] final determinations".[6]

4. We have indicated the scale of the challenge this presents for us, with base modelled allowances circa. £400m lower than our AMP 7 expenditure (equivalent to a 16% cut in activity levels from AMP7).[7] Other Disputing Companies note the potential scale of the impact for them.[8] These sentiments are also shared by other companies not in this process.[9] As such we disagree with Ofwat's characterisation that the CMA's models "suggest funding in line with current spending".[10] We agree that this outcome cannot be in the interests of customers – especially when seen alongside the acknowledged challenges with under-

[1] Where possible we have included references to third party submissions, but note that as these were only received on 14 November 2025, we have not yet had time to consider these in detail.
[2] NWL Response to PDs (**NWL PD Rep**), Section 2.1.4.
[3] Anglian Response to PDs (**ANH PD Rep**) Chapter B.1, p.25, Section 2.2; Wessex Response to PDs (**WSX PD Rep**) para. 4.15; Portsmouth Response to PDs (**PRT PD Rep**), p.4; Severn Trent Response to PDs (**SVT PD Rep**), p.2; Water UK Response to PDs (**WUK PD Rep**), p.4; United Utilities Response to PDs (**UUW PD Rep**) Section 2.3.1; Thames Water Response to PDs (**TMS PD Rep**), para. 7; South Staffs Response to PDs (**SSC PD Rep**) Appendix 1 p. 1.
[4] Ofwat Response to PDs: Base and Enhancement Costs (**Ofwat PD Rep Costs**), para 2.2
[5] NWL PD Rep, para.37 and Figure 3.
[6] Ofwat PD Rep Costs, para. 2.2.
[7] The sector wide adjustments do not offset this as they are over above "what base buys"
[8] ANH PR Rep Figure 3, p.26, Section 2.2; South East Response to PDs (**SEW PD Rep**) para. 1.6(a) and para. 1.17.
[9] SSC PD Rep, Appendix 1 p.1; TMS PD Rep, para. 16.
[10] Ofwat PD Rep Costs, para. 1.3. and para. 2.2.

funding of capital maintenance to maintain asset health.[11]

3. THERE IS A CONSENSUS THAT THE PD BASE MODELLING APPROACH IS FLAWED

5. All the main parties that engaged with the detail of the CMA's modelling expressed significant concerns. None of the parties have been able to defend the CMA's approach, even where it improves their position comparative to FD24, with some opting to simply remain silent. Ofwat expresses some shallow support for the PD decision (which it describes as showing that FD24 was not unduly stretching)[12] but is highly critical of the CMA's method in several areas and ultimately concludes it is not suitable for wider application.

6. There is strong commonality in the concerns raised about the flaws in the use of the LASSO technique. None of the main parties think that the use of LASSO is robust in a price control context, or that the models are fit for purpose, even when the code is corrected. They do not achieve the objective of producing robust estimates of efficient costs.

7. It is notable that there is academic support for Ofwat's approach to base cost modelling but seemingly none for the use of LASSO.[13] This is reflected in the responses to the PD.[14] The Anglian response and the Oxera report for South East both share our view that the approach was novel and untested in this area.[15]

8. **Delegation of regulatory judgment:** the CMA has not heeded the concerns expressed by the Main Parties regarding the potential use of LASSO, and has effectively delegated regulatory judgment to an algorithm, contrary to the direction of travel from the Independent Water Commission (**IWC**) regarding the need to "balance econometric outputs with expert judgement".[16]

9. **The approach is not suitable for regulatory cost assessment:** Oxera's report for South East reinforces the fundamental concern that LASSO is not suitable for use in a price control context, concluding that "the models cannot be reliably extrapolated to predict future cost allowances".[17] This is echoed by Professor Subal Kumbhakar on behalf of Anglian: "the framework used by the CMA and the resultant models developed do not provide a robust basis for setting efficient cost allowances". [18]

10. **Ofwat agree with these concerns and consider it "likely to be unsuitable for sector wide application":** Ofwat's critique of the CMA's use of LASSO, in its capacity as the expert sectoral regulator, is comprehensive and aligned with the Disputing Companies and other third parties. Ofwat is clear that the LASSO approach lacks the properties that would be critical for sector wide application, instead resulting in "complex models that reduce

[11] NWL PD Rep para. 38; ANH PR Rep Section 2.2; WSX PD Rep para. 4.17.
[12] Ofwat PD Rep Costs, para. 2.10.
[13] The model development approach Ofwat adopted was supported by Professor Andrew Smith who provided "expert econometrics support and advice": Ofwat PD Rep Costs, para. 2.8.
[14] In addition to the Professor Weeks report submitted in our response, Anglian's response also contain a report from Professor Kumbhakar
[15] ANH PD Rep, para. 180; Oxera, Assessment of CMA's base cost modelling in the PD (Report for SEW) 10.11.2025 (**Oxera SEW Base**), p.4.
[16] Southern Water Response to PD (**SRN PD Rep**), paras. 1.34-1.35.
[17] Oxera SEW Base, p.4.
[18] Professor Subal Kumbhakar, A review of the Competition and Market Authority's use of LASSO in the PR24 redeterminations report (**Kumbhakar Report**) p.25.

transparency, risk overfitting, and include coefficients that lack economic intuition":[19]

- it "prioritises in-sample fit over out-of-sample robustness, leading to over-specified models that may embed company-specific inefficiencies";
- the cross-validation design "is poorly suited to the dataset structure. Limited within company variation means models may learn fixed company effects, reducing generalisability.";
- there are interpretation challenges where "multiple density variables introduce collinearity and counter-intuitive relationships. Interaction terms between input prices and scale lack clear economic rationale."; and
- on input price variables "the inclusion of an energy price index may capture unrelated cost variation and act as a time trend. CEPA advised against its use due to risk of spurious correlation."[20]

11. **Procedural concerns**: Anglian reinforces our concerns with respect to the "procedural defects" that have impaired effective engagement.[21]

12. **Instability of the results:** Our concerns about the lack of robustness in the approach, leading to unstable outcomes, is also referenced by the other parties. Anglian notes that the "CMA's approach is highly sensitive to small changes in the dataset".[22] The Thames Investors identified a further major flaw in the use of LASSO "where simply expressing the same value in different units (for example, kilometres vs miles, or even kilometres vs metres) can deliver a difference of over £250 million in allocations".[23] When combined with the point raised within our PD response that the order of the variables affects the variables picked and therefore the results, we do not see how LASSO can be viewed as a serious technique that could be used in a price control redetermination.

13. **Ofwat's modelling approach is the best solution for this redetermination**: None of the Main Parties have presented a viable route for the flaws in the CMA's PD modelling approach to be addressed within the LASSO framework – it is fundamentally at odds with producing statistically robust models with strong engineering and economic rationale. Instead, it is the common view that the Ofwat modelling approach should be reinstated.[24]

14. **Pragmatism should not displace a proportionate, fair and reasonable outcome:** If the CMA ultimately opts to step away from an established modelling approach, that receives broad support from companies, academics and the regulator, to replace it with a heavily criticised experimental approach, it is insufficient to justify it on the basis of pragmatism in a time-constrained process as Ofwat suggests. The remaining four months of the CMA's statutory review window is similar to the time Ofwat has between draft and final determinations and is sufficient for the CMA to consider proposed modifications to the Ofwat

[19] Ofwat PD Rep Costs, pp. 9-10.
[20] Ofwat PD Rep Costs, Table 1, p.10.
[21] ANH PD Rep, para. 13.
[22] ANH PD Rep, Section 5.2, paras 157-162
[23] Thames Water Investors Response to PD (**TMS Investors PD Rep**), para. 10.
[24] NWL PD Rep para 142; ANH PD Rep para. 20; SEW PD Rep para. 2.48.

approach, which is already established and available to the CMA in any event.

15. We note that Ofwat suggests the CMA should continue with LASSO, with the coding error corrected, but it doesn't engage with the magnitude of the base allowance reduction that would result in - instead it notes that companies should not view the redeterminations as a one way bet.[25] We do not consider that Ofwat would be advocating support for a clear deterioration in model quality and robustness if impact of the CMA's novel method were an increase in the allowances for the sector.

4. THE SUGGESTIONS MADE BY SOUTH EAST WATER AND SOUTHERN WATER DO NOT ADDRESS THE FLAWS IN THE LASSO APPROACH

16. Southern and South East make some suggestions for improvements to the CMA's approach:

- South East suggests standalone treatment of energy and wages, a different approach to variable selection, change to the treatment of economies of scale at WTWs and a different approach to controlling for density;[26] and
- Southern suggests reconsidering the UQ challenge, removing APH from the candidate variables list, assessing economies of scale at WTWs outside the model as a CAC and changes to the treatment of energy costs.[27]

17. South East's approach effectively overrules the selection of variables by LASSO at multiple points and results in models much more comparable to Ofwat's. It fails to acknowledge that the CMA must also make a decision about the challenge to the data quality of the APH variable (as raised by ourselves and Southern). Oxera does, however, note that the confidence intervals produced by the models are wider than those used in its SoC which were based on the Ofwat framework.[28] The Oxera report setting out the detail of these changes concludes clearly that the "CMA's mechanistic and exclusive reliance on the LASSO method is not appropriate for regulatory cost assessment" and that it "should not replace the holistic approach that Ofwat and companies have followed for several price controls".[29]

18. Nor does Southern's modified LASSO approach scratch the surface in dealing with the flaws.[30] Our initial review of Southern's modelling output indicates that the revised models still have significant issues with the statistical significance of costs drivers, counter-intuitive functional forms with the interaction terms on energy and wages remaining, and signs on variables that go against engineering rationale (e.g. both positive and negative coefficients being estimated on the density variables in the "wastewater model – proposed LASSO" table). The diagnostic tests when applied to these models also perform poorly and show significant instability in the models estimation (e.g. there are high levels of multi collinearity in the variables and the models are highly sensitive to the removal of a single company which can change the sign of coefficients) just like the other iterations of LASSO considered.

[25] Ofwat PD Rep Costs, para. 1.3.
[26] SEW PD Rep, Section para. 2.15 onwards.
[27] SRN PD Rep, Section 3.
[28] Oxera SEW Base, Table 5.2.
[29] Oxera SEW Base, Section 5.3, p. 62.
[30] See Southern PD response document PDR-3-003

19. Given these findings, these suggestions do not address the fundamental issues outlined in Section 3 above. The only way to address the concerns and flaws in the approach is to adopt a more conventional approach to model selection in line with Ofwat and the CMA's precedent.

5. NEXT STEPS

20. We think it is clear that the LASSO approach does not have support or confidence from the main parties. The same sentiment is strongly echoed in the submissions from third parties. This is a significant decision for the CMA, not just in the context of this redetermination, but because it also sets the foundation for the future development of cost modelling. The CMA's views at PR14 clearly influenced the development of Ofwat's models for PR19 and PR24. The CMA should anticipate that it's approach and views will have broader consequences, which makes it vitally important that it is robust.

21. There must be a meaningful opportunity to review and comment on any updated position that the CMA adopts. As part of this the CMA must facilitate engagement on the fundamental questions that should underpin its decision whether to continue with the PD approach or if not, how it should adapt that approach.

22. ***Key questions*** that should be asked in that process include:

- ***the appropriateness of the LASSO method***- what is the appropriate use of an algorithm for model selection given so little practical experience of this type of approach being used for water and other regulated sectors and what is the right balance between regulatory stability and evolution of the framework;
- ***alignment with the engineering or economic rationale and logic***- how to best assess whether modelling results (e.g. implied cost driver relationships) are in line with engineering and economic intuition;
- ***the appropriate role and purpose of statistical robustness checks***- what statistical evidence and tests should be used to ensure that the models are sufficiently robust (especially given concerns raised by Ofwat and other parties about over-fitting); and
- ***the appropriate 'catch-up' efficiency challenge***- base cost allowances set in a similar fashion in PR19 resulted in companies needing to overspend those allowances by £9.8bn or 17.5% on average[31] with significant consequential impacts on the investability of the sector. Wider reviews of these issues clearly acknowledge the risk of historical underfunding of base capital maintenance allowances.[32] In that context, taking into account the model results and the implications for allowances, what is the appropriate efficiency challenge that should be applied?

23. We reiterate our support for the use of working group sessions or a hearing to explore these points before the CMA sets out its revised position and look forward to the CMA setting out the next steps in this area.

[31] Data WCPR 2024-25 - Ofwat, data taken from the 'Totex' tabs and inflated to 25/26 prices from 2017/18 prices. This suggests a total overall totex spend in 2020-25 across the sector of £66,290m versus allowances of £56,409m or an overspend of £9,881m or 17.5%.
[32] Independent Water Commission Final Report, see for example para 877. 'The current regulatory approach to infrastructure resilience is not delivering a sufficiently resilient system to tackle both short-term shocks and long-term pressures.'