

Portsmouth Water



FINAL WATER RESOURCES MANAGEMENT PLAN 2024

APPENDIX 1E – PROBLEM CHARACTERISATION

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Notice

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1. Summary of results

The assessment of Problem Characterisation is ‘a tool for assessing a company’s vulnerability to various strategic issues, risks and uncertainties’. The problem characterisation assessment method was set out in the WRSE *method statement: best value planning*¹ (Jan 2022) and follows UKWIR (2016) guidance².

By assessing the scale of water resources challenge a company faces, and the complexity of the options available to solve the challenge, a risk-based recommendation is made around the most appropriate risk-based methods to support development of the Water Resources Management Plan 2024 (WRMP24).

The result of the WRMP24 Problem Characterisation assessment documented in this report is that the Portsmouth Water supply area has identified as a “high level of concern”. This is based the scale of the water resources challenge, and the complexity of resolving it. The result of this assessment is an indication that several of the extended methods and even use of the ‘complex approaches’ set out in the UKWIR (2016) guidance may be appropriate for developing the WRMP24, such as the use of stochastic data sets and adaptive planning.

This conclusion informs and aligns with the WRSE regional Problem Characterisation assessment. The ‘high level of concern’ status is also reflected in the approaches and methods adopted in development of the regional Resilience Plan which is, in turn, informing Portsmouth Water’s WRMP24.

Within this report, the Portsmouth Water supply area considered is set out in Section 2 and the approach is set out in Section 3. The assessment scoring and commentary that supports the Problem Characterisation matrix result is documented in Section 4.

		Strategic Needs Score (“How big is the problem?”)			
		0-1	2 to 3	4 to 5	6
		(None)	(Small)	(Medium)	(Large)
Complexity Factors Score (“How difficult is it to solve?”)	Low (<7)	Green	Green	Green	Yellow
	Medium (7-11)	Green	Green	Yellow	Yellow
	High (11+)	Green	Yellow	Orange Portsmouth Water	Orange

Key	
Green	low level of concern means WRMP14 methods and EBSD decision making is appropriate
Yellow	moderate level of concern means some ‘extended’ methods may be appropriate
Orange	High level of concern means several of the extended methods and even use of the ‘complex approaches’ may be appropriate.

Figure 1-1 - Matrix using the results of the problem characterisation assessment to identify 'modelling complexity' of the decision-making approach for WRMP24

¹ WRSE, *Method statement: Best Value Planning* (Jan 2022), <https://www.wrse.org.uk/media/sy1bu4to/method-statement-best-value-planning.pdf>

² UKWIR (2016), Decision-making process: guidelines (16/WR/02/10)

2. Portsmouth Water's supply area

The Problem Characterisation has been based on Portsmouth Water's supply area. This operates as a single water resources zone.

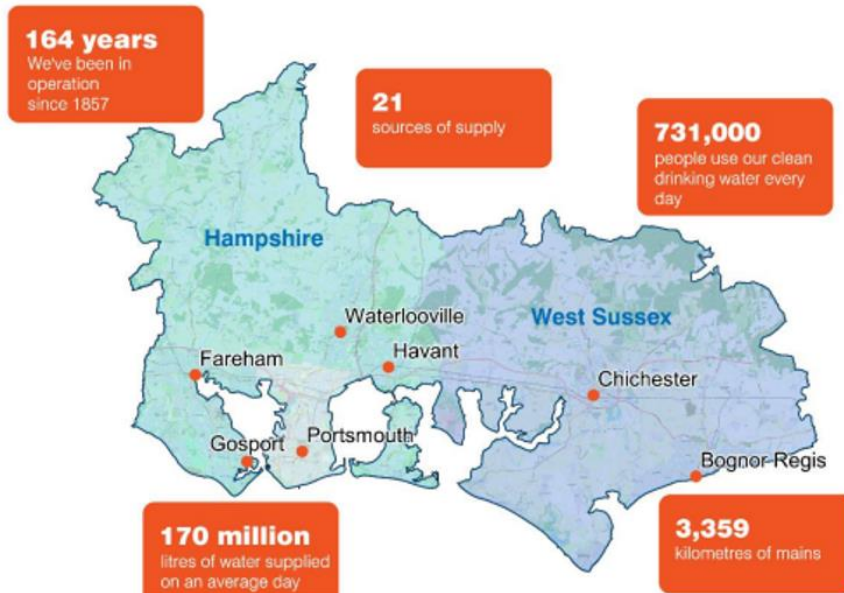


Figure 2-1 - The Portsmouth Water supply area operates as a single water resource zone

3. Approach

This Problem Characterisation assessment has aimed to fully comply with requirements specified in the Water Resources Planning Guidance (WRPG) and the methodology set out in the UKWIR, 2016 'WRMP 2019 Methods – Decision Making Process: Guidance'.

The assessment of Problem Characterisation is in two parts.

- The first part is to assess the strategic needs of a water resources zone (“How big is the problem?”).
- The second part is to assess complexity factors of the supply forecast, demand forecast and investment programme (“How difficult is it to solve?”).

These assessments are structured into 14 questions which should each be assigned a score between zero and two.

The scoring produced from the assessment is then entered into a matrix which identifies the ‘modelling complexity’ by grid boxes colours green, yellow or orange.

The colour indicated by the box that matches the assessment scoring for the supply area considered indicates which of the ranges of approaches (current, extended, or complex) is most appropriate to be used to support development of the WRMP.

Figure 3-1 - A summary of the Problem Characterisation methodology set out in the UKWIR (2016) Guidance

The WRMP19 Appendix H Problem Characterisation assessment report was used as a starting point. It was reviewed as a collaborative discussion to confirm what still applied for WRMP24 and what had changed and thus required updating.

For the WRMP24, each company across the South East of England contributed their individual Problem Characterisation assessments which were then combined to produce a Water Resources South East (WRSE) regional Problem Characterisation. This regional assessment of vulnerability was used to inform decisions around the methods and approaches that were used to develop the WRSE regional resilience plan.

4. Problem Characterisation assessment

4.1. Strategic needs assessment: ‘How big is the problem?’

The first part of the Problem Characterisation stage is an assessment of ‘strategic needs’. This entails three simple ‘headline’ questions that explore the size of any potential supply demand deficit, and the cost (in relative terms) of the supply and demand management options³.

Assessment questions: strategic needs		
Supply. Level of concern that customer service could be significantly affected by current or future supply side risks, without investment	1 - Moderately significant concerns	A score of 1 was decided on as the deficit at the start of the plan can be resolved by existing drought measures until the Havant Thicket Reservoir becomes operational in 2030 in the WRMP24 baseline. The WRMP24 then forecasts a developing deficit over the longer term planning period.
Demand. Level of concern that customer service could be significantly affected by current or future demand side risks, without investment	2 - Very significant concerns	Demand since WRMP19 has significantly differed from that forecast due to responses to the covid pandemic and continues due to increased home working and hand washing. Since WRMP19 the Portsmouth Water Supply area has been designated an area of serious water stress and universal metering is seen as a viable and legitimate option to be considered.
Investment. Level of concern over the acceptability of the cost of the likely investment programme, and/or that the likely investment programme contains contentious options (including environmental/planning risks)	2 - Very significant concerns	The likely investment programme indicated by the draft emerging WRSE regional plan contains both universal metering and a water recycling plant supplying Havant Thicket reservoir.
Total strategic needs score: 5		

³ UKWIR, 2016 ‘WRMP 2019 Methods – Decision Making Process: Guidance, ep169

4.2. Supply side complexity factor assessment:

Assessment questions: supply side complexity		
<p>S(a) Are there concerns about near term supply system performance, either because of recent Level of Service failures or because of poor understanding of system reliability/resilience under different or more severe droughts than those contained in the historic record? Is this exacerbated by uncertainties about the benefits of operational interventions contained in the Drought Plan?</p>	<p>1 - Moderately significant concerns</p>	<p>There have been no large recent supply failures. Portsmouth Water has experienced very few droughts therefore there is uncertainty over more severe droughts and the benefits of operational interventions.</p> <p>The risk in this area has reduced thanks to improved understanding with stochastics and PyWR conjunctive system modelling but remains moderate (a score of 1) because of the need to test pump Drought Permit S.</p>
<p>S(b) Are there concerns about future supply system performance, primarily due to uncertain impacts of climate change on vulnerable supply systems, including associated source deterioration (water quality, catchments etc.), or poor understanding?</p>	<p>1 - Moderately significant concerns</p>	<p>The results of the WRMP19 'Vulnerability Assessment' to climate change impacts indicated the Company to be at a 'Medium' level of risk. The risk in this area has reduced since WRMP19 thanks to improved climate change data for groundwater and PyWR modelling but remains a moderate risk (with a score of 1) as rising nitrates remain a concern.</p>
<p>S(c) Are there concerns about the potential for 'stepped' changes in supply (e.g. sustainability reductions, bulk imports etc.) in the near or medium term that are currently very uncertain?</p>	<p>2 - Very significant concerns</p>	<p>The Portsmouth Water supply area is reliant on chalk aquifers. The scale and timing of Environmental Destination is a significant driver of investment and remains an uncertainty.</p>
<p>S(d) Are there concerns that the 'DO' metric might fail to reflect resilience aspects that influence the choice of investment options (e.g. duration of failure), or are there conjunctive dependencies between new options (i.e. the amount of benefit from one option depends on the construction of another option). These can both be considered as non-linear problems.</p>	<p>1 - Moderately significant concerns</p>	<p>This is more of a concern for WRMP24 than it was for WRMP19 due to Havant Thicket being included in the baseline. There is an established need for joined up modelling of both Portsmouth Water and Southern Water systems to understand conjunctive use of both the Havant Thicket reservoir and abstractions on the River Itchen.</p>
Total supply side complexity score:		5

4.3. Demand side complexity factor assessment:

Assessment questions: demand side complexity		
Are there concerns about changes in current or near term demand , e.g. in terms of demand profile, total demand, or changes in economics/demographics or customer characteristics?	2 - Very significant concerns	There was concern around changes in demand during the Covid pandemic and how long these changes will continue. There is considerable uncertainty over what will be the new normal.
Does uncertainty associated with forecasts of demographic / economic / behavioural changes over the planning period cause concerns over the level of investment that may be required?	2 - Very significant concerns	Population is inherently uncertain; Portsmouth Water is in the South East with associated higher growth than most of the UK. Brexit adds much uncertainty to Population and Property forecasts. These factors do not alter the choice of investment options selected and the Preferred Plan has shown to be resilient to most future growth scenarios. The WRMP24 has a high reliance upon demand management and universal metering in the early years of the plan.
Are there concerns that a simple ‘dry year/normal year’ assessment of demand is not adequate , e.g. because of high sensitivity of demand to drought (so demand under severe events needs to be understood), or because demand versus drought timing is critical.	1 - Moderately significant concerns	There is a lack of company data as to how consumption varies under different drought scenarios as a result of implementing different supply and demand measures therefore analysis is largely based on assumptions which appear to be reasonable.
Total demand side complexity score:		5

4.4. Investment programme complexity factor assessment:

Assessment questions: Investment Programme complexity		
I(a) Are there concerns that capex uncertainty (particularly in relation to new or untested technologies) could compromise the company's ability to select a 'best value' portfolio over the planning period?	2 - Very significant concerns	Effluent reuse and universal metering are both likely to feature in the early years of the planning period. Although metering is proven across the industry, it is new to PW and will change the standard operating model.
I(b) Does the nature of feasible options mean that construction lead time or scheme promotability are a major driver of the choice of investment portfolio?	2 - Very significant concerns	The lead time of supply side options is driving universal metering. Universal metering and re-use promotability - the stated preferences of customers have prioritised re-use above desal.
I(c) Are there concerns that trade-offs between costs and non-monetised 'best value' considerations (social, environment) are so complex that they require quantified analysis (beyond SEA) to justify final investment decisions.	1 - Moderately significant concerns	The options for the Best Value plan are unlikely to be significantly different from a Least Cost plan for Portsmouth Water because of the feasible options set and chalk-based geology.
I(d) Is the investment programme sensitive to assumptions about the utilisation of new resources, mainly because of large differences in variable opex between investment options?	0 – no significant concerns	Portsmouth Water does not believe that the plan is sensitive to assumption of utilisation as the selection of options has not been driven by 'High' opex solutions.
Total investment programme complexity score: 5		

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