Jersey Water

Water Resources and Drought Management Plan

Appendix G. Target Headroom

CONTENTS

JERSEY WATER RESOURCES AND DROUGHT MANAGEMENT PLAN

APPENDIX G. TARGET HEADROOM

1. ROLE OF TARGET HEADROOM

Target headroom is an essential component of water resources planning to ensure that appropriate measures are taken to safeguard customers from the many uncertainties associated with forecasting demand and the assessment of water available for use over the planning horizon. These include political, social, environmental, climate change and technical factors outside of the water company's control that may significantly influence components of the supply-demand balance.

2. METHODOLOGIES

The UK has developed two target headroom methodologies:

- "A practical method for converting uncertainty into headroom" (UKWIR, 1998)
- "An improved method for assessing headroom" (UKWIR, 2002)

The 1998 method is a pragmatic, scoring approach which is simpler to use and provides a coarse estimate of target headroom allowance. The 2002 approach is a probabilistic method which involves ascribing probability density functions to each element of uncertainty and running multiple simulations to calculate the target headroom allowance.

The simpler (1998) method has been applied given the scale of the water resources issues faced by Jersey Water, but the more precise assessment may be required if the final supply-demand balance is sensitive to the target headroom values adopted.

The 1998 methodology involves scoring the potential effects on the supply-demand balance of the following issues:-

Supply-side issues:
S1. Vulnerable surface water licences
S2. Vulnerable groundwater licences
S3. Time limited licences
S4. Bulk transfers
S5. Gradual pollution causing a reduction in abstraction
S6. Accuracy of supply-side data
S7. Single source dominance and critical periods
S8. Uncertainty of climate change on yield

Demand-side issues:

D1. Accuracy of sub-component data

D2. Demand forecast variation

D3. Uncertainty of climate change on demand

3. CALCULATION OF TARGET HEADROOM

Table G.1 summarises the target headroom components that were identified as being applicable to Jersey Water and presents the scores at 2015 and 2040 derived by applying the UKWIR 1998 methodology for each component.

Table G.1 Assessment of target headroom components

Factor	Description	2017 score	2045 score
S1. Vulnerable surface water licences	It is difficult to assess the effects of future regulation in Jersey but some sources may be at low risk in the future. For the purpose of target headroom scoring it is assumed that >10% of WAFU is at "unlikely" risk of abstraction licences being revoked or substantially reduced.	0	2
S2. Vulnerable groundwater licences	None	0	0
S3. Time limited licences	None – there are no known termination clauses relating to permissions or agreements for water abstraction sources	0	0
S4. Bulk transfers	None – there are no water imports to Jersey Water	0	0
S5. Gradual pollution causing a reduction in abstraction	Some sources are at risk, e.g. reservoirs being impacted by contamination or worsening algal blooms that cannot be resolved by remedial measures, and boreholes being impacted by PFOS. For the purpose of target headroom scoring it is assumed that 5 to 15% of WAFU is at "likely as not" risk.	0	2
S6. Accuracy of supply-side data	The baseline yield assessment has been based 107 years of flow record generated using rainfall-runoff models. The rainfall-runoff models are calibrated on non-drought data (1993-1994) which introduces an element of uncertainty. There is insufficient data about the full availability of some sources e.g. due to water quality issues. For the purpose of target headroom scoring the categories assumed are: over 65 years record, poor sufficiency of data, and poor accuracy of naturalisation.	3.5	3.5
S7. Single source dominance	None – the Jersey Water Resource Zone has a range of water sources, including two large raw water storage facilities such that no one source dominates the annual deployable output of the Water Resource Zone. However, under peak conditions La Rosière can	0	0

Factor	Description	2017 score	2045 score
	contribute up to 47% of deployable output from available sources.		
S8. Uncertainty of climate change on yield	The assessed climate change scenarios suggest there is small variation in the impacts baseline source yield. So "less than 15% WAFU spread" applies.	0	10
D1. Accuracy of demand sub-component data	Data sources for average base year demand are generally good i.e. Class A, and distribution input data is good. The small (<5%) gaps in water balance are allocated to unaccounted for water, so it can be assumed that initial water balance is "acceptable".	2	2
D2. Demand forecast variation	DYAA with climate change forecasts at 2045: range is over 35% of WAFU, and best estimate tends to upper forecast so Case 2 applies.	0	8
D3. Uncertainty of climate change on demand	The DYAA scenario forecasts at 2045 show very low effect of climate change. So a low level of impact is likely.	0	1
Combining scores:	Sum of scores for S1, S2, S3, S4 and S5	**1**	**4**
	Square root of sum of squares of S6 S7 S8 D1 D2 and D3 as per UKWIR 1998 methodology	**4.0**	**13.5**
	TOTAL SCORE	**5.0**	**17.5**

The 1998 UKWIR report contains a graph that converts the calculated total target headroom scores (from final row of Table G.1) to determine the target headroom values as percentages of Water Available For Use (WAFU). The relationship presented in the UKWIR report graph has been used to convert the total scores in Table G.1 to headroom percentage of WAFU values, as summarised in Table G.2 below. The values for Jersey Water range from 5.36% in 2017 to 9.98% in 2045.

Table G.2 Calculation of target headroom values

	2017	2020	2025	2030	2035	2040	2045
Total Headroom Score	5.03						17.46
Target Headroom (as % of WAFU)	5.36	5.85	6.68	7.50	8.33	9.15	9.98
Target Headroom (as Ml/d)	1.0	1.1	1.3	1.4	1.5	1.6	1.8

4. CONCLUSIONS AND RECOMMENDATIONS

The target headroom allowance to be included as a buffer for uncertainty in the supply-demand balance projections has been calculated as **5.36% of WAFU in 2017 (1.0 Ml/d)**, rising to **9.98% of WAFU in 2045 (1.8 Ml/d)**. These are comparable with typical values applied by water companies in England and Wales over the same planning horizon and so provide a realistic profile of target headroom margin.

Whilst target headroom provides an important buffer in the supply-demand balance calculations, it is important to also undertake scenario testing to test the resilience of the proposed water resources plan to specific more extreme, but plausible outcomes. The scenario testing of alternative programmes is presented in **Appendix J**.