

Appendix 3

Supply-side drought management options



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1. Introduction



In our Water Resources Management Plan (WRMP) 2019 we are proposing to move to a new Level of Service (LoS) by 2025. This is to ensure that no customers are exposed to the risk of severe restrictions such as rota cuts in a severe drought event by the end of AMP7 (2025). This reflects the updated Water Resource Planning Guidelines. We have planned for resilience to severe drought impact from 2025, and investment is presented in our WRMP 2019 to ensure this commitment is met. A severe drought is defined as a drought event with a 1 in 200 year return period.

In reality any of our Water Resource Zones (WRZs) can be affected by drought. As part of our continued long-term water resource and drought planning, we are also considering the feasibility of additional demand- and supply-side options we may need in future should a more extreme drought occur within any of our WRZs, such as a 1 in 500 year return period or beyond. This is detailed in **Section 3.4, Main Plan** and **Appendix 12**.

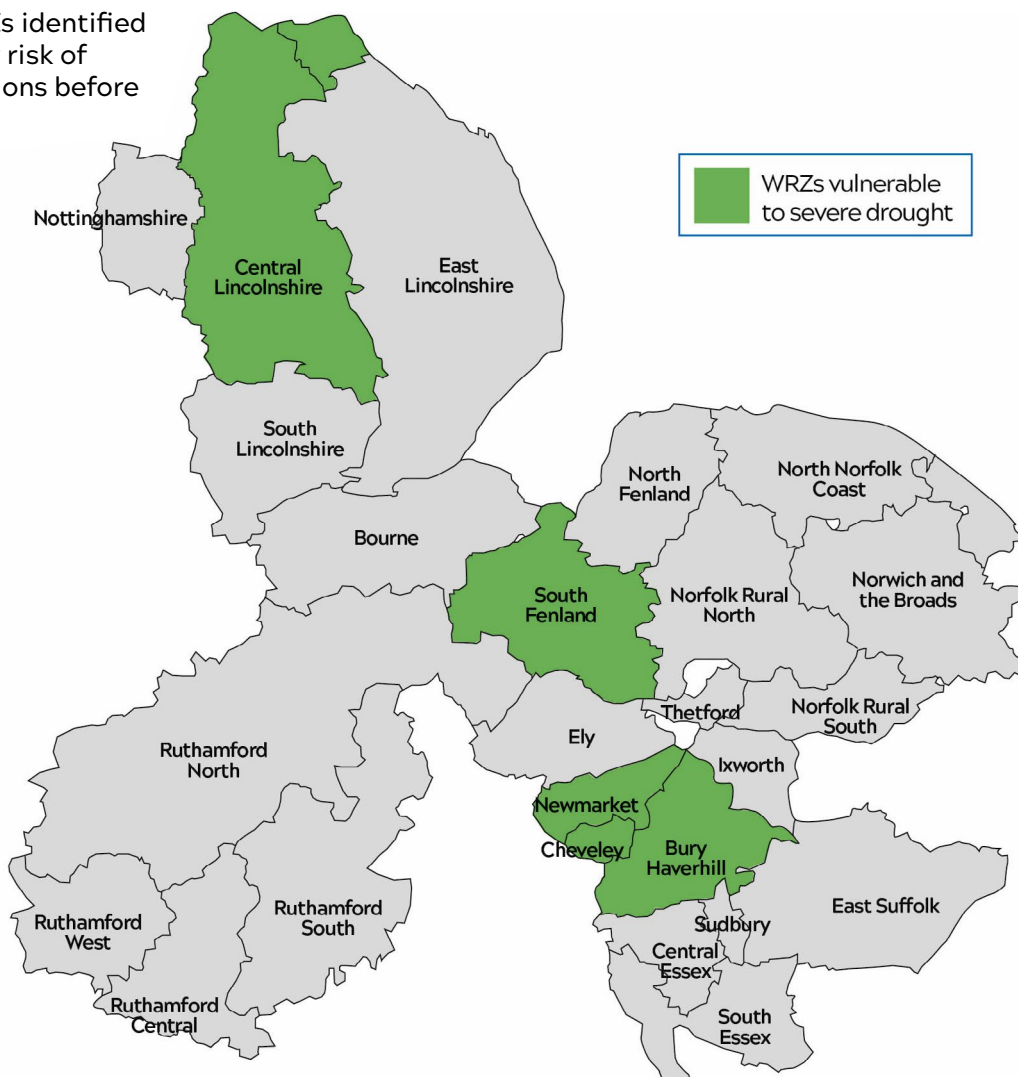
2. 1 in 200 year drought risk



Drought analysis in our WRMP 2019 identified the majority of our WRZs are already resilient against a 1 in 200 year drought event, due in part to previous drought investment. We have identified remaining vulnerabilities to a severe drought event in five WRZs, as outlined below in Figure 2.1.

In Cheveley, Bury-Haverhill, Newmarket and South Fenland WRZs, there are modelled impacts on groundwater sources that reduce baseline supplies at WRZ level. There is also an impact in the Central Lincolnshire WRZ, due to vulnerability at our River Trent surface water intake.

Figure 2.1: WRZs identified as at particular risk of severe restrictions before 2025



We have identified strategic water supply schemes for these zones in the WRMP 2019 that will ensure resilience to a 1 in 200 year event by 2025. However, there is a risk that an event of this severity could occur before the schemes are operational.

The forecast severe drought impacts on supply for each WRZ are shown in the table below. These were modelled for the WRMP 2019 and further details can be found in the **WRMP 2019 Supply Forecast Report**.

Table 2.1: Summary of WRMP 2019 forecast severe drought impacts on supply

WRZ	Forecast supply deficit (Ml/d) modelled for WRMP 2019
Cheveley	-0.3
Newmarket	-3.0
Bury-Haverhill	-3.0
South Fenland	-9.0
Central Lincs	-11.0

We have subsequently undertaken further assessment of these WRZs over this interim period, and compared the forecast supply impact against our WRMP 2019 supply-demand balance (SDB), which includes expected benefits from proposed demand management options. This has identified a number of residual supply surpluses in the relevant zones which can offset either entirely or in part the drought impact. This is summarised in Tables 2.2-2.6 below. These are provided for each WRZ of interest and show how we have worked through the options available to offset the drought risk until 2025. One of the options available is tankering but it is important to note that whilst tankering is a standard action for some of the WRZs below, it is more likely to be an extreme action in other zones (**Appendix 12**).

In zones where there is a small drought risk remaining, we undertook an options scoping exercise to identify high level localised options to provide additional supply, primarily focussed on developing existing or new groundwater supplies from neighbouring areas not vulnerable to drought.

However, timescales or environmental impact for many are prohibitive, or benefits are highly uncertain and would require extensive, possibly abortive, further work. We would therefore seek to mitigate this through employment of Temporary Use Bans (TUBs), which we feel is a reasonable approach due to the severity of the drought in this scenario, and in line with our Drought Plan 2022 management approach.

The calculation of the demand saving benefit from these restrictions is discussed in more detail in **Appendix 2**. Furthermore, we may also consider to redirect our targeted leakage management and bring forward smart metering schemes to further reduce demand in these WRZs.

Table 2.2: Summary of how the interim drought risk will be offset for Bury-Haverhill (all values in MI/d)

		2021-22	2022-23	2023-24	2024-25
Bury-Haverhill	Starting supply-demand balance (including demand management option benefits)	0.82	-2.07	-2.12	-4.99
	Interim drought risk	-3.00	-3.00	-3.00	-3.00
	Supply-demand balance	-2.18	-5.07	-5.12	-7.99
	Target headroom	1.28	1.31	1.34	1.35
	Supply-demand balance	-0.91	-3.77	-3.78	-6.63
	Transfer to Thetford & Ixworth WRZs	0.00	0.00	0.00	-2.33
	Transfer from Newmarket WRZ	0.00	0.00	0.00	9.75
	Supply-demand balance	-0.91	-3.77	-3.78	0.79
	Expected savings from TUBs	1.80	1.80	1.80	1.80
	Tankering (East)	0.00	1.97	1.98	0.00
	Final supply-demand balance	0.89	0.00	0.00	2.59

Bury-Haverhill WRZ sees a 3 MI/d drought impact. This can be offset in part by the small surplus in the starting SDB and target headroom.

There is a minor deficit remaining in the SDB for years 2021-24 which can be resolved through the

application of TUBs and tankering (for 2022-24 only), if required. For the year 2024-25 the deficit is resolved by the completion of the strategic grid from Newmarket to Bury-Haverhill, as this particular section is being delivered ahead of the rest of the strategic grid.

Table 2.3: Summary of how the interim drought risk will be offset for Central Lincs (all values in MI/d)

		2021-22	2022-23	2023-24	2024-25
Central Lincolnshire	Starting supply-demand balance (including demand management option benefits)	31.80	19.43	20.06	19.26
	Interim drought risk	-11.00	-11.00	-11.00	-11.00
	Final supply-demand balance	20.80	8.43	9.06	8.26

There is sufficient surplus in Central Lincolnshire's starting SDB to fully mitigate the drought impact of 11 MI/d. Central Lincolnshire also benefits from a drought permit option for the River Trent surface water intake, but this is not required unless an extreme drought is anticipated.

Table 2.4: Summary of how the interim drought risk will be offset for Cheveley (all values in MI/d)

		2021-22	2022-23	2023-24	2024-25
Cheveley	Starting supply-demand balance (including demand management option benefits)	0.21	0.12	0.13	0.14
	Interim drought risk	-0.30	-0.30	-0.30	-0.30
	Supply-demand balance	-0.09	-0.18	-0.17	-0.16
	Target headroom	0.06	0.07	0.07	0.07
	Expected savings from TUBs	0.09	0.09	0.09	0.09
	Tankering (East)	0.00	0.02	0.01	0.01
	Final supply-demand balance	0.06	0.00	0.00	0.00

Cheveley WRZ sees a 0.3 MI/d drought impact during AMP7. This is almost fully offset by the small starting surplus in the zone and target headroom. The resultant impact is negligible, but employment of TUBs could be used and tankering if required.

Table 2.5: Summary of how the interim drought risk will be offset for Newmarket (all values in MI/d)

		2021-22	2022-23	2023-24	2024-25
Newmarket	Starting supply-demand balance (including demand management option benefits)	4.11	3.12	3.10	3.08
	Interim drought risk	-3.00	-3.00	-3.00	-3.00
	Supply-demand balance	1.11	0.12	0.10	0.08
	Target headroom	0.83	0.83	0.84	0.85
	Ely WRZ to Newmarket WRZ Transfer	0.00	0.00	0.00	6.68
	Newmarket WRZ to Bury Haverhill WRZ Transfer	0.00	0.00	0.00	-9.75
	Supply-demand balance	1.94	0.95	0.94	-2.14
	Expected savings from TUBs	1.10	1.10	1.10	1.10
	Tankering (East)	0.00	0.00	0.00	1.04
	Final supply-demand balance	3.04	2.05	2.04	0.00

The starting surplus in Newmarket WRZ (with demand management options) is sufficient to mitigate drought impact without needing to use TUBs. In 2024/25, part of the strategic grid will be in place and will support the transfer of water from areas of supply surplus to supply deficit. Newmarket WRZ technically receives imported water from Ely WRZ, although

this in turn is received from further upstream on the strategic grid pipeline, rather than coming from Ely WRZ surplus. Additionally, water is sent to support demand from Bury-Haverhill through a new transfer, which can be offset through the Newmarket WRZ's target headroom, expected savings from the implementation of TUBs and tankering.

Table 2.6: Summary of how the interim drought risk will be offset for South Fenland (all values in MI/d)

		2021-22	2022-23	2023-24	2024-25
South Fenland	Starting supply-demand balance (including demand management option benefits)	0.66	0.71	1.57	2.08
	Interim drought risk	-9.00	-9.00	-9.00	-9.00
	Supply-demand balance	-8.34	-8.29	-7.43	-6.92
	Target headroom	1.39	1.43	1.44	1.48
	Transfer from North Fenland (not including 0.1MI/d baseline transfer)	5.00	4.91	4.05	3.49
	Expected savings from TUBs	1.95	1.95	1.95	1.95
	Final supply-demand balance	0.00	0.00	0.00	0.00

There is a large drought impact in South Fenland of 9 MI/d and only a very small starting surplus in the zone. It can be partially offset by a transfer in from the surplus in North Fenland and target headroom. As there is still a remaining drought impact on the SDB, some utilisation of TUBs is required to offset this drought risk in full, but this is considered appropriate and in line with our Drought Plan 2022 approach.



Cover photo - Anglian Water's Rutland Water reservoir, a 1,555-hectare biological Site of Special Scientific Interest (SSSI), east of Oakham in Rutland. It was designated a SSSI in 1984.