draft Drought Plan 2027

Appendix 9: Drought Lessons Learned

May 2026

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1. Introduction

Lessons-learned activities are a key part of drought planning, ensuring each event contributes to improving operational readiness and long-term resilience. By reviewing actions, decisions and outcomes, we identify what worked well, where challenges arose, and how processes, communication and interventions can be strengthened. This supports transparent, evidence-based planning and reinforces our commitment to responsible water resource management.

Following a public water supply drought, we aim to complete a lessons-learned review within six months of returning to normal conditions, led by the DMT and water resources team. Within a year of completing this review, we intend to share evidence of how recommendations have been implemented. The review will cover all drought stages. For environmental droughts, we will carry out an internal review and work with regulators and stakeholders where required. These reviews allow timely improvements while operational experience is still current. More information on the topics covered is provided in **Section 3.5, Main Plan**.

Understanding the type of drought is central to effective planning. Environmental drought occurs when low rainfall reduces flows or levels in natural water bodies, causing ecological stress, even when public supplies remain secure. A Public Water Supply (PWS) drought arises when rainfall shortages threaten supply reliability. PWS droughts often develop more slowly, as systems are designed to withstand short dry periods. Distinguishing between drought types ensures appropriate operational, environmental and customer-focused measures. Lessons-learned activities help refine this understanding and keep the Drought Plan robust and adaptive.

Past droughts show that impacts vary depending on duration, severity and location. Short, intense summer droughts, such as 2025, typically affect surface water, while prolonged low winter recharge impacts aquifers and pumped-storage reservoirs.

Historical events illustrate these differences, such as:

- **1988-92**: was defined by significant stress on groundwater resources and reduced baseflows to rivers during summer 1991.
- **1995-97:** drought placed greater pressure on surface water storage.
- **2011-12:** PWS drought primarily affected rivers and reservoirs in the western part of our region.

Our region often experiences short periods of low rainfall, and our system is generally resilient to these. Detailed groundwater assessments have identified more vulnerable sources, informing targeted investment (**Part 2, Main Plan** and **Appendix 3**). Previous droughts have also highlighted the importance of early, clear communication with customers and stakeholders, supported by strong water-efficiency programmes.

2. 2025 and 2022-23

The prolonged dry periods experienced in 2025 and 2022-23, were classed as environmental droughts in our region and we only reached drought level 1 from a PWS perspective.

2.1 2025 Context

Spring and summer 2025 broke historical climate records across the UK. England experienced its driest spring in more than 100 years (beaten only by 1893), and its second sunniest spring on record, with only 2020 being sunnier. The UK recorded the warmest spring for mean temperature since the series began in 1884, surpassing the previous record from 2024. The UK also saw the warmest summer on record, with a mean temperature of 16.10°C between 1 June and 31 August; 1.51°C above the long-term average (LTA).

In terms of the Anglian region, the spring and summer rainfall accumulation (March to August) was 50% of the LTA, which is the second lowest since records began in 1899, only beaten by 1976.

Due to potential risk of the dry weather continuing over winter and into 2026, we worked closely with the Environment Agency, Natural England and other stakeholders such as the RSPB to ensure that our draft drought permits for Rutland Water and Pitsford Water were application ready in case they were required for winter refill. Rainfall and river flows improved at the end of 2025 and therefore winter drought permits were not required.

Regional rainfall in November was 175% of the LTA, however December was actually below average at 56mm, 96% of the LTA. Despite the wetter end to the year, 2025 rainfall accumulation (January to December) only reached 81% of the LTA.

Following the low rainfall experienced in 2025 river flows, reservoir levels and groundwater levels reached notably low points during the autumn and winter. Some groundwater levels in north west Norfolk ended the year at a lower position than previous dry periods such as 2022.

The prolonged dry weather created operational challenges, especially in relation to raw water quality in the wider catchment, for example high nitrates were being observed in a number of rivers across the region, limiting abstraction into some of our reservoirs during the winter refill period. Learning from 2022-23 was utilised in 2025, for example we benefited from new data from the additional catchment monitors that had been installed. We also utilised revised abstraction management strategies, which aided with current abstraction management procedures.

2.2 2022-23 Context

2022-2023 developed against a backdrop of exceptional weather conditions across the Anglian Water region. The summer of 2022 brought prolonged periods of hot, dry weather, culminating in record breaking temperatures that placed sustained pressure on both water resources and the wider supply system. The highest temperature ever recorded in the UK was in our region - Coningsby, Lincolnshire at 40.3°C (19 July 2022).

As the dry spell continued into early autumn, groundwater levels fell to some of the lowest points observed in recent years. In several locations, the absence of up-to-date observational groundwater data made it increasingly difficult to track the rate of decline, highlighting the limitations of relying solely on external datasets during rapidly changing conditions.

Surface water sources were similarly affected. Reduced river flows and elevated environmental pressures meant that abstraction had to be carefully managed, particularly in sensitive catchments such as the Wensum, where gauging uncertainties created additional operational challenges. At the same time, raw water quality challenges emerged, most notably rising nitrate concentrations in the Great Ouse and Grafham Water, requiring additional monitoring and operational management.

Conditions began to improve in March 2023. March 2023 produced the highest number of March rain days on record and was the 5th wettest on record. 2023 ended up being one of the wettest years in our 132-year record for the Anglian region. The period from September 2022 to February 2024 was the wettest 18-month period on record for England. The Environment Agency formally moved all areas that were in “Recovering Drought” to “Normal” status on 20 November 2023.

2.3 Lessons Identified from 2025 and 2022-23

In response to the emerging environmental droughts in 2025 and 2022-23, we strengthened our operational coordination, enhanced monitoring, modelling capabilities, collaboration with external partners and drought permit readiness. The environmental droughts also highlighted areas of improvement to this iteration of the Drought Plan and our future drought response.

Despite the prolonged lack of rainfall and the record-breaking temperatures, our ongoing investment in resilience (for example Ruthamford resilience) and industry leading demand actions (including use of our smart meters) helped to manage demand effectively and aided the recovery of resources. This meant that we kept our water resource situation secure without the need for drought permits in 2025 and 2022. This is important as it means we did not put additional pressure on an already stressed environment.

The review highlighted several areas of success that strengthened our response during these periods:

- Our customers responded to our ask to reduced demand. We saw an 8% reduction in peak demand in summer 2025 in comparison to summer 2022.
- We continued our investment in drought resilience; continued progress on our new reservoir programmes, strategic interconnectors and leakage reduction.
- We improved our readiness for TUBs, should they be required.

The review also highlighted several areas of improvement or continuous improvement, which will aid our readiness for future droughts:

- To improve raw water quality monitoring and telemetry to allow closer tracking of the water resources situation and water quality. For example, in 2022 a combination of a reliance on external groundwater data and inconsistent availability of data resulted in supplementary dips being taken, which put extra demand on operational teams at a time of high demand on operational resources. This reinforced the need for improved internal monitoring capability, which is being explored throughout AMP8 (2025-2030).
- Continue to collaborate with regulators and regional and national groups - WRE, WRSE, WReN, NDG, Water UK to align planning and share best practice.
- Continue to explore and develop schemes, options and drought innovations that could feed into future drought response especially in relation to extreme actions.
- We need to plan for faster, more volatile drought periods, and understand the impact of both quantity and quality on our water resources position. Actions include bringing water quality outages into forecasts and ensuring water quality considerations are more effectively represented within water resource modelling systems. Refinement of our rainfall runoff models (e.g. River Wensum) to better reflect low flows. These improvements are being made as part of our next WRMP.

A review of the events also helped identify improvements that have been made to this iteration of the Drought Plan. Some of these improvements include:

- Adding indicative drought levels to our direct river sources, with associated drought permit options, to give a clearer picture on when actions may be required.
- Updating our indicative drought levels on the observation groundwater sources as well as increasing the amount of observation sources that we monitor. This provides a more accurate representation of the appropriate actions that may be required in the associated supply system.
- Incorporating the updated UKWIR Code of Practice findings such as the aligned restriction exception tables.
- A full review and update of all drought permit documentation and processes including environmental assessments, environmental monitoring and application document templates has been completed. This also supports our drought permit readiness.
- Updating our drought management structure to align with our revised approach.

These actions and insights have informed the development of this Drought Plan and continue to shape our approach to drought preparedness, operational resilience, and stakeholder engagement.

2.4 Case Study - Enhanced drought resilience and being drought permit application ready

Anglian Water did not need to resort to drought permits during 2025 and 2022. This was possible due to years of consistent investment on supply options and reducing demand for water through low leakage and water-wise customers. All helping us to protect the environment.

Owing to our long-standing focus on demand management, our per capita consumption (the amount of litres of water used by customers a day) is one of the lowest in the country - 10 litres below the national average in 2024/25 (national average = 138.3, Anglian Water = 128.7). Our consistent messaging and engagement have helped us to return demand levels to those seen pre-pandemic (where we had a big spike due to changes in lifestyle and work conditions) and we were classed as the 'Top Performer' for per capita consumption in Ofwat's 2024/25 performance assessment.

Despite not needing to apply or implement drought permits, we did enter into pre-application discussions with the Environment Agency and Natural England, which was the first time since 2011-12. This allowed us to carry out a thorough review of our drought permit application documents and make changes to improve our drought permit readiness. This included creating and updating the application document templates that we have for all drought permits, as well as updating the environmental assessments that support the applications.

2.5 Case Study - Lower Nene Working Group

At Anglian Water it is important to us that we support other users and the environment wherever possible. During dry weather events abstractors such as farmers may struggle to irrigate their crops due to licence condition restrictions. This led to the Lower Nene Working Group being setup several years ago.

As part of the group, we have built a good relationship with the agricultural users and eNGOs in the Lower Nene. At the start of the spring-summer periods, we collectively worked together alongside the Environment Agency, to review the resources situation in the Lower Nene and assess the need for river support for the downstream users during that summer. When a need is identified and we have available water in Rutland Water, we proactively reduce abstraction at our Wansford abstraction point on the River Nene to provide additional water downstream for agriculture and the environment during the key irrigation period.

The Lower Nene Working Group met throughout the prolonged dry weather periods of 2025 and 2022, when flows in the River Nene declined. In 2025 we reduced abstraction to allow an extra 875 Ml (875 million litres) of water to flow downstream. Via the same agreement, we also reduced abstraction to allow an extra 1132 Ml (~1.1 billion litres) of water to flow downstream in 2022. This water could then be utilised by the RSPB Nene Washes and Lower Nene agricultural abstractors.

3. 2018-2019

3.1 Context

The dry period of 2018-19 was classed as an environmental drought. This means that although we had spells of prolonged dry weather and higher demand, it did not have a significant impact on PWS resources. The 2018-19 period was marked by highly variable rainfall across the Anglian Water region, with cumulative totals over both 12-month and 36-month periods reaching exceptionally low levels by spring 2019. Between June 2018 and May 2019, the region experienced a full year of above-average Soil Moisture Deficit (SMD), reflecting the sustained dryness of soils and the limited opportunity for effective recharge.

During the winter of 2018-19, rivers across the region received little to no replenishment of baseflows. By January 2019, all monitored rivers were classified as below normal or lower for the time of year, with nearly half showing exceptionally low flows. At the same time, our supply network experienced prolonged periods of elevated demand during the summers of both 2018 and 2019, including several significant peak-demand days exceeding 1,400 Ml/d.

These combined pressures led to declining storage in several reservoirs, with Alton Water experiencing the most pronounced impact. Groundwater conditions also deteriorated, with levels dropping below normal at many sites during 2018. The lack of meaningful winter recharge resulted in some aquifers falling below the now superseded Drought Alert Curves.

By 2019, a clear regional contrast had emerged: the eastern part of the region continued to experience dry conditions, while the north benefited from considerably higher rainfall. This spatial variability influenced both surface water and groundwater responses and shaped the operational challenges faced during the period.

The prolonged dry weather experienced during 2018-19 required a coordinated and proactive operational response. In February 2019, the Drought Management Team (DMT) was convened to oversee the situation, supported by specialist sub-groups established to address specific operational and resource challenges. In line with the Drought Plan 2019, the Water Resources team increased the frequency and detail of monitoring, forecasting, and reporting for affected sources to ensure that timely and appropriate actions could be taken.

Recovery began in October 2019, when a succession of storms brought substantial rainfall across the region. The winter of 2019-20 delivered 140% of the Long-Term Average (LTA) rainfall, with all areas receiving exceptionally high totals. This sustained wet period enabled rivers, reservoirs, and aquifers to recover, bringing the dry weather event to an end.

3.2 Lessons identified from 2018-19

The Lessons Learned review highlighted several areas of success that strengthened our response during the period:

- Targeted communications were delivered in areas such as Colchester during summer 2019, providing water-saving advice, information on local water sources, and access to water-efficiency devices.
- Operational activities, including eel-screen installation, were rescheduled to maximise abstraction opportunities and support reservoir refill.
- Improved collaboration with key stakeholders, including the National Farmers Union, Internal Drainage Boards, RSPB, and Natural England through groups such as the Lower Nene Working Group.
- Adaptation of groundwater source rehabilitation practices. During dry periods, we worked with the Environment Agency and local agricultural users to identify opportunities for discharged water to be used for irrigation rather than being returned to watercourses or tankered to treatment works.
- Strengthened joint working with Affinity Water on demand-forecasting scenarios and weekly operational coordination, particularly relating to Grafham Water exports and Ardleigh Reservoir.
- Development of a retail situation report for non-household customers, providing clearer insight into the prevailing water resources position.

Following the 2018-19 event, we undertook a comprehensive review of data, operational decisions, and outcomes to identify key lessons and areas of good practice. Principal lessons learned that were embedded into our drought response and Drought Plan 2022 after the 2018-19 event included:

- The need to refine dry-weather indicators to better differentiate between drought types. As part of this work, we collaborated with the Environment Agency to align drought management levels and associated actions.
- The importance of updating groundwater drought levels, such as the formerly used Drought Alert Curve (DAC). These improvements were incorporated into Drought Plan 2022.
- A clearer understanding of how weather variability can influence the scheduling of planned operational activities.
- The value of balancing proactive and reactive communication to ensure consistent and timely messaging.

3.3 Case Study - Communication and Engagement

2019 provided valuable insight from customers about our tone of messaging and was valuable in planning future customer communications. In 2019, email targeting by supply area was trialled for the first time. This was successful and led to a positive response in open rates and click through data. Over 65,000 emails were sent out across Ipswich and Colchester with an average open rate of 31%. Feedback from online community groups was positive. Customers also responded well to targeted communications at a local level, relevant to their communities. Online, our customers engaged well with data-related content such as water resources levels and demand graphs, demonstrating that there is a good level of interest in this kind of information.

There were improved external communications on the dry weather, including taking part in local news programs, updated website, social media rainfall charts and videos illustrating groundwater conditions to support customer understanding.

4. 2011-2012

4.1 Context

This event is our most recent PWS drought. The drought of 2011-12 developed following an extended period of exceptionally low rainfall across the Anglian region. By July 2011 the region had experienced nearly six consecutive months of markedly dry weather with Soil Moisture Deficit (SMD) levels at record highs. The prolonged dry conditions of both 2010 and 2011 significantly reduced flows in the River Nene, limiting opportunities to refill key strategic reservoirs at Pitsford Water and Rutland Water. In response, and as a precautionary measure to protect future supplies, we applied for two drought permits on the River Nene. These were granted in December 2011 and remained in place until April 2012, enabling us to maximise the water available for abstraction during a critical period.

Conditions continued to deteriorate into 2012. By March, the preceding 18 months were being described as the driest on record, and reservoir storage remained well below expected levels. Low river flows across the wider Anglian region further constrained refill opportunities, while the area affected by drought began to extend into groundwater sources. With resource pressures intensifying, we introduced a TUB on 5 April 2012, this was our first in two decades, alongside several other water companies in the south and east of England.

At this stage, there was growing concern about the potential consequences of a third consecutive dry winter. Without decisive action, there was a risk that supplies to customers in the Ruthamford WRZs could come under severe pressure. In response, we implemented a series of measures to strengthen resilience and mitigate the emerging risks.

The situation changed rapidly from April 2012 onwards, when an extended period of exceptionally high rainfall brought the drought to an end. Over the six months from April to September, record rainfall levels enabled reservoirs and rivers to recover, alleviating the pressures that had built up over the preceding years. As a result, we were able to lift the TUB on 14 June 2012, ten weeks after it was introduced.

4.2 Lessons Identified from 2011-12

In response to drought conditions, we carried out extensive communications campaigns before implementing the TUB for the first time in 20 years, alongside six other water companies in the south and east of England. For several years after the event, we invested significant capital expenditure to increase our resilience and protect customers' supplies. The capital programme considered investment opportunities to commission a number of our licensed abstraction sources, although the requirement to conform with the Water Framework Directive impacted the viability of some schemes.

Several successes to strengthen resilience and mitigate against emerging risks were identified during the lessons learned process, some of the key actions that were implemented are below:

- Reduced leakage to record low levels at the time.
- Launched our largest water-efficiency initiative at the time (the Drop20 campaign).
- Accelerated a £47 million capital investment programme to enhance system robustness.
- Played a leading role in the national response through active participation in the National Drought Group.

Lessons identified and implemented following the PWS drought of 2011-12 include:

- Work to enhance public knowledge of the current water resources situation and drought outside of periods of prolonged dry weather and drought through the Anglian Water communication channels.
- Key investments during this drought included new groundwater sources, a river augmentation main, booster pumps, Rutland Water refill schemes, leakage enhancement and pressure management.
- Enhanced the interconnection in the Ruthamford region through the Hannington to Pitsford link.
- Reviewed the need for new groundwater sources and investment.

4.3 Case Study - Pitsford Water and Rutland Water drought permits

The importance of collaborative working with key stakeholders was highlighted during the later stages of the summer of 2011. Regular drought liaison meetings between the Environment Agency and Anglian Water were instigated shortly after the region was announced as being in drought in July 2011. Concerns expressed by the Environment Agency regarding rainfall and river flows in the Nene catchment prompted detailed reservoir storage projections to be undertaken for a range of flow scenarios, which led us to take the precautionary step of applying for two winter drought permits.

We continued to work closely with regional contacts in the Environment Agency to ensure that we addressed all their concerns in a timely manner. We engaged in early discussions with Natural England and reached agreement on appropriate mitigation measures to ensure that we fulfilled Habitats Directive requirements. We consulted widely and further discussions were also necessary with a number of key stakeholders including angling clubs, district councils and internal drainage boards.

The timely and successful drought permit application, which enabled us to protect public water supplies while minimising environmental and user impacts, was significantly strengthened by the strong relationships we have with key stakeholders.

5. Conclusion

The insights gathered from recent and historic droughts demonstrate the importance of continually refining our operational, tactical, and strategic approach to drought management. Each event, whether an environmental drought affecting river flows and ecosystems, or a Public Water Supply drought placing direct pressure on customer supplies, has contributed to a deeper understanding of how our water resources respond under different conditions and how our interventions can be most effective.

Across the 2011-12, 2018-19, 2022-23 and 2025 events, several consistent themes have emerged: the value of robust monitoring and forecasting, the need for flexible operational planning, the importance of well-timed and measured communication, and the benefits of strong collaboration with regulators, other water companies, and local stakeholders. These experiences have also reinforced the need to maintain and enhance the resilience of our infrastructure, to improve the visibility and quality of data used in decision-making, and to ensure that environmental considerations remain central to our response.

Looking ahead, we will continue to strengthen our ability to anticipate and manage drought conditions through improved modelling, clearer internal decision pathways, and enhanced reporting for both internal and external audiences. The development of “off-the-shelf” operational action plans, updated drought levels, and improved drought permit readiness will further support a more agile and evidence-based response. Maintaining transparent communication with customers and stakeholders will remain a priority, helping to build understanding of the wider context in which decisions are made and reinforcing confidence in our approach.

Overall, the lessons captured across these events underline our commitment to continuous improvement and long-term resilience. By embedding these findings into future planning cycles, we will continue to strengthen our preparedness for both environmental and PWS droughts and ensure that our drought management strategy remains robust, adaptive, and aligned with the needs of the communities and environments we serve.

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