1.2 Drinking Water Services Report 2023 Operations Supporting Evidence

March 2023

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1 EXECUTIVE SUMMARY

This document details and evidences the operational actions and outcomes aligned to South West Water's Drought Plan (the Drought Plan) and in support of the Drought Permit application.

The document covers the following aspects

- Operational changes implemented to avoid future drought-related issues
- Proposed approach to water shortages in the Roadford Water Resource Zone (WRZ)
- Updated approach during periods of high demands/low rainfall to minimise impacts on supply and/or demand
- Further changes to operational practices to reduce the likelihood of future drought related issues
    - Evidence of Level 1 Drought Plan: Network optimisation
    - Evidence of Level 3 Drought Plan: Carrying out treatment works maintenance to increase output capacity.

2 OPERATIONAL APPROACH

2.1 Operational changes implemented

South West Water has appointed a Water Systems Manager to oversee improvements to production scheduling, demand management and strategic network operations. This role is accountable for 'source to tap' optimisation of South West Water's potable water operation and is a key interface between Water Resources, Operations and Service Support Centre functions.

2.2 Proposed approach to water shortages in the Roadford area

As detailed in subsequent sections of this report the approach to dealing with projected shortages is based on enacting the interventions as set out in the Drought Plan.

In addition to these interventions, South West Water has an internal Alternative Water Supplies (AWS) team that have access to a fleet of 13 tankers, Arlington tanks and bottled water which can all be deployed in the event of a supply interruption. The team is split geographically to offer cover to all of Devon and Cornwall with depots in Newquay, Plymouth and Exeter.

South West Water also has access to Mutual Aid through the recognised water industry arrangements. In the event of a significant issue the request for assistance would be communicated through South West Water's Service Support Centre and coordinated by the Event/Incident response teams.

Proactive control of South West Water's production and distribution assets is key to effective use of available resources. South West Water has a Central Process Control Team who are responsible for balancing production and demand, utilising remote control and access through the iSCADA and smart networks systems. This resource is supplemented by a Strategic

Network standby team who are utilised to add additional resilience during high demand periods, events, or incidents.

The Central Process Control (CPC) team use various tools to understand the supply and demand balance position, both for discrete areas and for the wider strategic distribution network. The iSCADA system is the primary tool utilised to monitor and manage production, storage and distribution of potable water in near real time.

The CPC team is able to access 'smart network' controls which enable remote operation of key pumps and valves, this in turn enables potable water to be transferred between supply zones as and when the need arises. Other analytical tools, such as the Service Reservoir report are used to provide insight into the longer-term impacts of supply and demand and further inform the target operating strategy and production forecasts.

3 ACTIONS TAKEN IN LINE WITH THE DROUGHT PLAN

3.1 Updated approach during periods of high demands/low rainfall to minimise impacts on supply and/or demand

In line with the Drought Plan, South West Water has increased its leakage control, enhanced pressure management activities, and optimised the network as detailed in the next section.

In addition, during high demand periods South West Water has increased resource in its Service Support Centre. The Strategic Networks team have been operating on a 24/7 basis during these periods with the key objectives of maintaining a stable supply demand balance, optimising available resources, and minimising the impact of outages on network storage/customer supplies.

This resource has been supplemented by a Senior Management wraparound support arrangement. Again, this has operated on a 24/7 or extended hours basis. Senior Managers have been present in the Service Support Centre to aid effective deployment of resources (water and human) and close management of supply demand pinch points.

During these peak times South West Water has increased manning levels at key Water Treatment Works (WTW), either 24/7 or over extended hours. This allows for continual monitoring and optimisation of processes and offsite pumping as well as rapid response to issues that might ordinarily lead to extended outage.

Finally, South West Water has implemented emergency standby rotations for alternative water supplies coordination, MEICA support, Operational Technology support and supply chain M&E support. This has provided South West Water with additional layers of resilience should multiple or concurrent issues arise which would exhaust its internal resource and potentially lead to extended periods of outage.

These actions have optimised operation of our available water resources to conserve supplies in the Roadford area as far as possible.

3.2 Further changes to operational practices to avoid or reduce the likelihood of future drought related issues

Evidence of Level 1 Drought Plan: Network optimisation

Making changes to the network to “re-zone” the water supply system

Drought Plan: Demand on a particular water resource or treatment works may be reduced and reallocated to a resource/treatment works which is under less pressure. South West Water's Strategic Networks Team has developed area plans which sets out the available options to make urgent changes to a local network in such circumstances. An example of this occurred in the summer of 2019 during a period of high temperature and high demand. South West Water's system is normally managed to use water from its Tiverton treatment works to support the North Devon area, but in 2019 it reversed flows to Tiverton at a time when North Devon had surplus water available.

Roadford 2022/3: Distribution areas have been re-zoned to reduce demand on Northcombe Water Treatment Works (WTW) and increase demand on Tamar WTW.

The network at East/West Putford has been reconfigured to decrease supply from the Roadford zone, supported from Tamar system and offset flow from Northcombe WTW - estimated 0.3Ml/d.

Tamar WTW is maximised to allow reduced pumping volume to enter Hersham from Brandis Corner – estimated 2Ml/d.

In summary these network changes have provided c.2.3 Ml/d of sustainable benefit to the Roadford supply zone. Available water from Tamar WTW has been utilised to reinforce supplies to the Roadford supply zone and therefore reduce the demand on Northcombe WTW and Roadford Lake.

Temporary booster stations

Drought Plan: Because of experience of the 2018 prolonged dry period, South West Water has seen how the tactical use of temporary booster pumping stations can permit improved water transfers between supply areas. South West Water has developed a series of boosters within mobile containers (known as “Hogs”) and installed connection points at potential drought pinch points in the South West Water network across the region. They can be rapidly deployed to an area as needed. There are currently ten such temporary booster systems available with varying pumping duties to meet a range of required flows.

Roadford: In preparation for summer demand peaks and in anticipation of prolonged dry weather, mobile booster ‘hogs’ were deployed at George Hill and Dennis Down. The temporary booster stations made provision for the transfer of water from Pynes WTW (Wimbleball Water Resource Zone (WRZ) in support of Prewley/Northcombe WTW (Roadford WRZ).

In summary these supply system changes have provided a further c.3Ml/d of sustainable demand reduction in the Roadford supply zone therefore relieving pressure on abstractions from Roadford Lake.

Reducing treatment works losses

Drought Plan: South West Water is fortunate that the majority of its treatment works experience incredibly low works losses (or process losses) as a result of previous investments and improvements in site operation. This includes the re-use of backwash water which is now a common feature of South West Water's operations. However, during times of drought, South West Water looks at opportunities to reduce losses further if feasible. There is currently a programme in place to identify and signal which treatment works have an above average loss of water and this allows South West Water to target sites particularly if it identifies deterioration in performance during droughts.

Roadford: Through Winter 2022/23 the engineering maintenance team conducted a review of all WTW losses and conducted a programme of work to optimise these where appropriate. At Northcombe WTW all filter run times, works flow control, filter drain down times and sludge were optimised to allow increased production output, this water in turn was made available for the Northcombe supply area.

Tankering to service reservoirs

Drought Plan: If necessary, South West Water has capacity to tanker treated water from a treatment works or a service reservoir into a neighbouring network as a temporary measure. This intervention is normally only employed as a result of an unplanned outage, or significant mains burst, but it is an option should South West Water experience unprecedented demand. Tankering is not normally considered a standard response for periods of high demand, but it can be considered as an option in specific circumstances.

Roadford: Tankering has been implemented when responding to the peaks in demand driven by the two heatwave periods. This type of intensive tankering operation is labour intensive and impacts on South West Water's ability to use its internal fleet of (13) tankers to respond to supply interruption events.

Tankering of potable water has significant limitations and should only be seen as a supplementary measure capable of transmitting relatively small volumes of water (max c.1 Ml/d). The South West Water Alternative Water Supplies (AWS) team is a regional team consisting of 18 full time employees and thirteen dedicated potable water tankers (3x30M3 and 10x15M3) delivering a regional service on a shift rotation basis, their primary focus being the mitigation of supply interruption events. Deploying these resources on an around the clock basis, taking into account the impact of British domestic driving hours legislation, maintenance requirements and sampling obligations, is extremely resource hungry and difficult to maintain over an extended period. Support from the supply chain is utilised wherever possible but the limitations on suitable fleet (hygienically sound) and trained staff provide further barriers to this being a long-term method of mitigation.

In extreme circumstances the Water Industry operates a ‘mutual aid’ arrangement whereby assistance can be sought from other companies. In those cases, where support is offered it can only be relied for relatively short periods of time (days rather than weeks).

3.3 Evidence of Level 3 Drought Plan: Carrying out treatment works maintenance to increase output capacity

Carrying out treatment works maintenance where there is potential to increase works output capacity

Drought Plan: As key treatment works processes are put under higher load their performance may decline and this may lead to a slight reduction in the works' ability to output at its design rate. South West Water's in-house capability to carry out non-routine filter and clarifier cleaning has been specifically set up to minimise downtime of key plant and limit the impact on the treatment works. This has proven a major advantage, particularly during periods of high demand, and contributed to low rates of both planned and unplanned outage'

Roadford: South West Water's programme of winter maintenance across all of the WTW, including Northcombe was completed during winter 2022/23. This programme focuses on the cleaning and maintenance of key process units and is followed by flow trials to ensure the works can meet its design deployable output ahead of the summer peak season.

Investigations by South West Water's internal Process Engineer identified the potential for an increase in peak deployable output from Northcombe WTW. Following an in-depth process assessment and trial period the deployable output from the WTW was increased from 52 – 55 Ml/d.

At a more tactical level South West Water has redeployed its internal 'MOT' maintenance teams to focus on the continual optimisation of process and plant at Tamar Lakes and Bratton WTW. In addition, South West Water has sought support from the supply chain and its internal Operational Technology team to bolster its emergency response capability and further mitigate the time and volume impact of any unplanned outage.

The above pro-active maintenance has meant that Northcombe and the other WTWs that may support the zone have been able to operate at peak capacity during throughout drought period. South West Water's rate of unplanned outage, as illustrated elsewhere in this report, remain consistently amongst the best in the industry.