1.3 Drinking Water Services Report 2022 – Operations Supporting Evidence to 1.1 Description of the Proposals

November 2022

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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. This document outlines the steps taken to assist the Colliford WRZ, for which this permit application supports.

The document covers the following aspects

- Operational changes implemented to avoid future drought-related issues
- Approach to water shortages across the Colliford WRZ
- Approach during periods of high demands/low rainfall to minimise impacts on supply and/or demand
- Enhanced 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: Treatment works optimisation

In summary, we have undertaken the following measures:

- Rezoning & utilising strategic network supply options, which provides a maximum benefit of 16.5Mld
- College WTW to Stithians transfer, which is expected to provide a maximum benefit of 2Mld
- Reducing treatment works losses, which has provided a benefit of c.1.5Mld
- Tankering in response to the peaks in demand driven by the two heatwave periods.
- Enhanced maintenance activities at WTWs in the Colliford WRZ, which has ensured operation at optimal efficiency.

2 DESCRIPTION OF THE PROPOSALS

2.1 Operational changes implemented to avoid future drought related issues.

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 Colliford WRZ

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.

Due to the size of the WRZ it would not be feasible to mount an effective AWS effort for any appreciable length of time.

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 ("**CPC**") 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 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 accordance with our Drought Plan, South West Water has increased its leakage control, enhanced pressure management activities, and optimised the network as detailed in the next section prior to implementing a temporary use ban.

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.

South West Water has implemented an emergency standby rota 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 resulted in no extended periods of outage and an optimised operation of our available water resources to conserve supplies in the Colliford WRZ and supply area as far as possible.

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

3.2.1 Making changes to the network to "rezone" a water supply system

Our Drought Plan states:

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.

Support to balance demand within the Colliford WRZ is dependent on water in storage at supplementary Reservoirs and rivers (Drift Reservoir, Stithians Reservoir and River Delank). All sources are managed in line with abstraction licences and reservoir control curves.

The Water Resources Review Group (WRRG) provides governance for the management of resources in accordance with our WRMP and long term strategy. Liaison with Operations and Central Process Control (CPC) is managed through monthly WRRG meetings, chaired by a representative from the Water Resources Team, and attended by all key stakeholders and are formally recorded and minuted.

In times of extreme dry weather or forecast long term heat, a weekly Supply/Demand group is convened, this is Director led with cross functional representation. In 2022 these meetings were convened on 13th May and initially held fortnightly and moved to weekly from 10th June as risk increased.

A weekly 'Gold' preparedness meeting structure is in place was also implemented. Cross functional calls, hosted by the rostered duty Gold Manager, were held each Friday to

assess actual or forecast risks across weekend periods. This group is also stood up reactively on receipt of amber or red weather warnings.

In accordance with our drought plan the frequency of management meetings has increased as Colliford Reservoir level passes through drought trigger levels; Silver meets daily Monday to Friday with twice weekly Gold meetings, representative from Drinking Water Services sit in both of these meetings. The executive are briefed daily upon progress.

Strategic network options are listed below, these are operated flexibly throughout a given year as and when water is available and demand conditions dictate available headroom at supporting WTWs.

Increased flow from De Lank to Racecourse Service Reservoir (SR) and onward to Beacon SR. This reduces demand on Fox Park SR, which is normally supplied from Restormel WTW, maximum benefit of 3Mld.

Increased flow De Lank to Bears Downs SR via Tin Farr valve – operation of an automated valve to maximise flows from De Lank WTW into Bears Down SR. This reduces demand on Fox Park SR which is normally supplied from Restormel WTW, maximum benefit of 1Mld.

Stithians support to Threemilestone area – operation of a manual valve at Kerly to rezone the Threemilestone supply zone and provide support to Kilaganoon SR. This reduces demand on the Cornwall Spine Main, normally supplied from Restormel WTW, maximum benefit of 2Mld.

Stithians support to Trevu SR – operation of an automated valve to divert flow from Lanner Hill SR via Dulcoath Water Booster Station (WBS) into Trevu SR. This reduces demand on the Cornwall Spine Main, normally supplied from Restormel WTW, maximum benefit of 4Mld

Wendron support to Tregonning Hill – pumping from Trelissick WBS to increase flow from Wendron WTW into Tregonning Hill SR. This reduces the need to pump from Trevelyan SR and reduces demand on the Cornwall Spine Main, normally supplied from Restormel WTW, maximum benefit of 1.5Mld.

Carnmenellis SR support to Wendron – operation of a manual valve to increase flow from Carnmenellis SR into Wendron WTW. This further reduces the need to pump from Trevelyan SR and reduces demand on the Cornwall Spine Main, normally supplied from Restormel WTW, maximum benefit of 1Mld

Increased flow from Drift WTW into East Penzance – manual valving to increased supply areas fed from Drift WTW, additional properties in East Penzance supported. This reduces demand on the Cornwall Spine Main, normally supplied from Restormel WTW, maximum benefit of 1Mld.

Drift support to Ludgvan SR – automated valving to support Ludgvan SR, via Kerris SR. This reduces demand on the Cornwall Spine Main, normally supplied from Restormel WTW, maximum benefit of 2Mld.

3.2.2 Temporary booster stations

Our Drought Plan states:

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 10 such temporary booster systems available with varying pumping duties to meet a range of required flows.

South West Water are currently delivering an engineering scheme to facilitate transfer of water from College WTW to the Stithians Reservoir thereby supporting the Colliford WRZ. This project will enable pumping of a maximum 2Mld. Upon recovery of levels within Stithians Reservoir this will allow the volume of water released to be deployed into the wider Colliford WRZ as per the options detailed in section 3.2 of this report. (Stithians – Threemilestone and Stithians - Trevu).

As detailed in section 3.2 of this report, there has been historic investment in network interconnectivity in the Colliford WRZ, and network transfers are primarily achieved by the re-configuration of existing assets, as opposed to the use of temporary boosters.

3.2.3 Reducing treatment works losses

Our Drought Plan states:

South West Water is fortunate that the majority of its treatment works experience very 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.

During winter 21/22 South West Waters engineering maintenance team carried out a review of all WTW losses and subsequent remedial works. At Restormel, Stithians, Drift and Delank WTWs all filter run times, works flow control, filter drain down times and sludge decant systems were optimised to allow increased production output. In addition, all filter outlet valves were inspected and replaced where defective or passing volumes of treated water, this water in turn was made available for the Colliford WRZ supply area c.1Mld.

At Stithians WTW we reduced sample flows, which run to waste after passing through online instruments and replaced traditional centrifugal pumps with more controllable peristaltic pumps, saving an estimated c.0.5Mld which in turn was made available for deployment.

3.2.4 Tankering to service reservoirs

Our Drought Plan states:

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.

During 2022 has only been implemented at a tactical level and is response 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.

In extreme circumstances the Water Industry operates a 'mutual aid' arrangement whereby assistance can be sought from other companies. In all 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

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

Our Drought Plan states:

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'

South West Water's programme of winter maintenance across all of the WTWs, including Restormel, Stithians, Drift and Delank was completed during winter 2021/22. 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.

As a component of South West Waters' 'transformation programme' a dedicated internal team of Process and Maintenance Engineers has been tasked with implementing an in depth site based risk action plan (SBAP) which identifies resilience enhancements across the entire site asset base. This process has been completed at Stithians WTW and is currently in progress at Restormel WTW. The outcome of the programme is an improvement in site resilience as reflected in our unplanned outage performance.

At a more tactical level South West Water has at peak times redeployed its internal 'MOT' maintenance teams to focus on the continual optimisation of process and plant at Restormel, Stithians, Drift and Delank. At Lowermoor WTW operational enhancements have been delivered to ensure broader functionality for the use of Hawk's Tor Pit water.

In addition, South West Water has sought support from the supply chain and its internal Operational Technology (OT) 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 resulted in Restormel, Stithians Drift and De Lank operating at peak capacity as required during throughout drought period.

As a result of the above actions South West Water's rate of unplanned outage, as illustrated elsewhere in this report, remain consistently amongst the best in the industry.