Freeze Thaw Action Plan and response to Ofwat

September 2018

FINAL

Southern Water

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Foreword

We are proud to have the responsibility for supplying water to 2.3 million customers across the South East of England and we take this responsibility very seriously. In late February to early March 2018, we experienced a Freeze/Thaw event. This led to 7,700 (0.33%) of our customers being out of supply for up to four hours and 2,246 (0.1%) of our customers being out of supply for up to three days. In our recently submitted PR19 Business Plan, we described our ambition to create a resilient water future for customers in the South East of England, defined by five key long-term outcomes; Resources; Environment; Economy; Communities; Value. These are underpinned by five transformational programmes described in Chapter seven of our business plan and it starts by **being brilliant at the basics.**

We recognise the issues raised in Ofwat's "Out in the Cold" report and letter dated 19th June 2018, and also our lessons learnt from previous experiences, and we are implementing key improvement programmes in the current AMP period to deliver step changes in our organisation and improve overall operational resilience.

We have put resilience at the heart of our business and we are transforming as an organisation, developing innovative approaches and best practices to improve our operational resilience. The improvement actions we have put in place are designed to cover both Freeze/Thaw and broader challenges, including other extreme weather events.

These programmes and initiatives will contribute to a significant improvement in our planning, incident management and overall communications with our customers and stakeholders. Our customers should expect fewer supply interruptions, have confidence in our response and speed of response, be informed and empowered before, during and after a supply disruption event.

In developing this action plan, we have consulted with the CCG, (including Sussex Chamber of commerce) and CCW and continue to share improvements in our incident management plan with the Local Resilience Forums. We appreciate the time, effort and feedback from these parties and look forward to sharing our progress.

It is in this context we respond to the challenges identified during the Freeze/Thaw event in February/March 2018. Our response describes improvement actions completed since the event and those which are ongoing, Many of our improvement initiatives were in flight before the Freeze/Thaw event and approximately 40% of our plan has been completed. Examples of completed activities include our new incident management framework and the increase in our contact centre capacity by 100%.

In addition, we demonstrate how these align to longer term plans described in the PR19 Business plan. Our plan has been externally assured and we have coordinated with other companies to share best practice.

We have great confidence in our ability to continuously innovate to solve the challenges we face as an industry and believe collaborative working with others in the sector and beyond our traditional sector is key to unlocking some of the opportunities for our customers. We continue to collaborate with other organisations and Water UK in areas such as mutual aid, non-household retail, stakeholder engagement, bulk supplies, and bottled water provision.

Ian McAulay, Chief Executive Officer

1.0 Executive Summary

In late February to early March 2018, we experienced a Freeze/Thaw event. This led to 7,700 (0.33%) of our customers being out of supply for up to four hours and 2,246 (0.1%) of our customers being out of supply for up to three days.

We acknowledge the issues raised in Ofwat's "Out in the Cold" report and letter dated 19th June 2018 and have further clarified these issues by listening to our customers and other stakeholders. We have since carried out an internal review to understand the root causes. Some of the challenges we faced are being addressed by programmes and initiatives in flight prior to the Freeze/Thaw event. In other areas, we have learnt lessons and are re-scoping our transformation programmes to respond directly to specific challenges identified by the Freeze/Thaw event review. In addition, we are working with Water UK to collaborate more broadly on issues such as bulk supply, bottled water, non-household retail and mutual aid.

In May 2018 we carried out an internal review to understand the root causes of the issues related to Freeze/Thaw and we launched several specific initiatives to address these issues. Our action plan discusses how we are bringing all these activities together to align them with our longer-term plans with clear executive commitment. In addition, we are rescoping some of our programmes to cover improvements specific to the Freeze/Thaw event.

Our plan responds directly to each of the six areas raised in Ofwat's report and describes how these are being addressed. Where improvements are ongoing, we state when activities will be complete with clear ownership identified including an executive sponsor. The plan focuses on immediate key priorities which will deliver meaningful results for our customers; examples include implementing near real-time operational measures to enable better preparedness and proactive stakeholder engagement and customer contact, and the merger of our customer teams to double the number of staff available during an event. We were also one of the first water companies to introduce an enhanced compensation scheme for customers experiencing water shortages as a result of this extreme event. Longer term initiatives are described in our PR19 Business Plan.

Systems of Systems

Recognising that resilience is provided by an enhanced understanding of how our assets work together as a system we have piloted a zonal resilience approach in three of our 10 water zones; Thanet, Isle of Wight and Brighton. This will be rolled out to the remaining seven water supply areas in our region by May 2019. Another initiative to enhance our resilience is our Smart Networks pilot in Rownhams utilising real-time monitoring and artificial intelligence improving our ability to predict and manage incidents. Our longer term planning incorporates improved interconnection of our systems to further enhance resilience and provide a more secure water future and improved management of water resource in the South-East of England.

Ensuring delivery through appropriate governance and executive sponsorship

The two key improvement programmes in flight are Water First and Operational Excellence (see Appendices 3.0 and 4.0). In addition, in September 2017 we launched an improvement programme to develop a new Incident Management Framework for Operations and earlier this year we created a new role in the organisation to focus on building our business wide security and incident management framework.

There are clear governance structures in place with executive sponsorship mainly through our two improvement programmes; Water First and Operational Excellence. The structures within these programmes will provide day to day responsibility and management of the actions and, where we

have standalone actions, they will be managed through appropriate accountability routes. To support this we have named an executive sponsor for every action in our Action plan (see Appendix 1.0).

Last year we strengthened our Executive Leadership Team (ELT) with three new members from within our business leading new directorates – Compliance and Asset Resilience, Wholesale Water and Wholesale Wastewater. Additionally, we have appointed executives from beyond our sector with experience of delivering large transformation programmes and leading organisations through culture change. We have broadened the scope of our drought governance group by establishing an Operational Resilience governance group with members from our executive leadership and our senior management teams.

Stakeholder engagement

In developing our action plan, we have engaged with CCG members (including the Sussex Chamber of Commerce) and Consumer Council for Water (CCW) to capture their inputs early on and share the action plan we have developed. Key lessons for us was the focus on constant education, communication and engagement with our customers to ensure communications is continuous, timely and up to date, giving our customers clear information before, during and after an event. We will continue to work with them just as we have extensively engaged them in developing our PR19 Business Plan, we will focus on building our relationships and working arrangements to ensure we deliver good customer outcomes today and in the longer term.

Customer communications

We want to ensure active customer ownership and participation in working with CCG and Southern Water to develop and design solutions in how we best support customers during an incident. In addition to that, we would launch our incident tracking tool to identify the most successful engagement channel for our customers and once complete, our customer segmentation model would enable improved tailoring of messages by better understanding of where attention and support is needed during an incident.

Wider industry collaboration

As part of our approach to developing this action plan, we have coordinated with South East Water, Thames Water and Severn Trent to share lessons learnt, solutions and best practices. Some of the issues raised in Ofwat's "Out in the Cold" report require a collective industry approach to resolve them more effectively, to that end, we are working collaboratively with Water UK on the key areas identified in Jim Marshall's letter of 2nd Aug 2018. Southern Water employees including members of our ELT already contribute actively to key groups within Water UK and we will continue to lead and support these efforts to drive effective solutions across the sector.

As requested in Ofwat's letter, we have engaged Jacobs to externally assure our report; they have scrutinised our plans and engaged with our action owners to evaluate the credibility of our approach and have provided a supporting report.

1.1 Our approach

We have applied a four stage bottom up approach to collating our action plan and have engaged ELT, our CCG, CCW and an external assurance party to ensure that our plan is achievable.

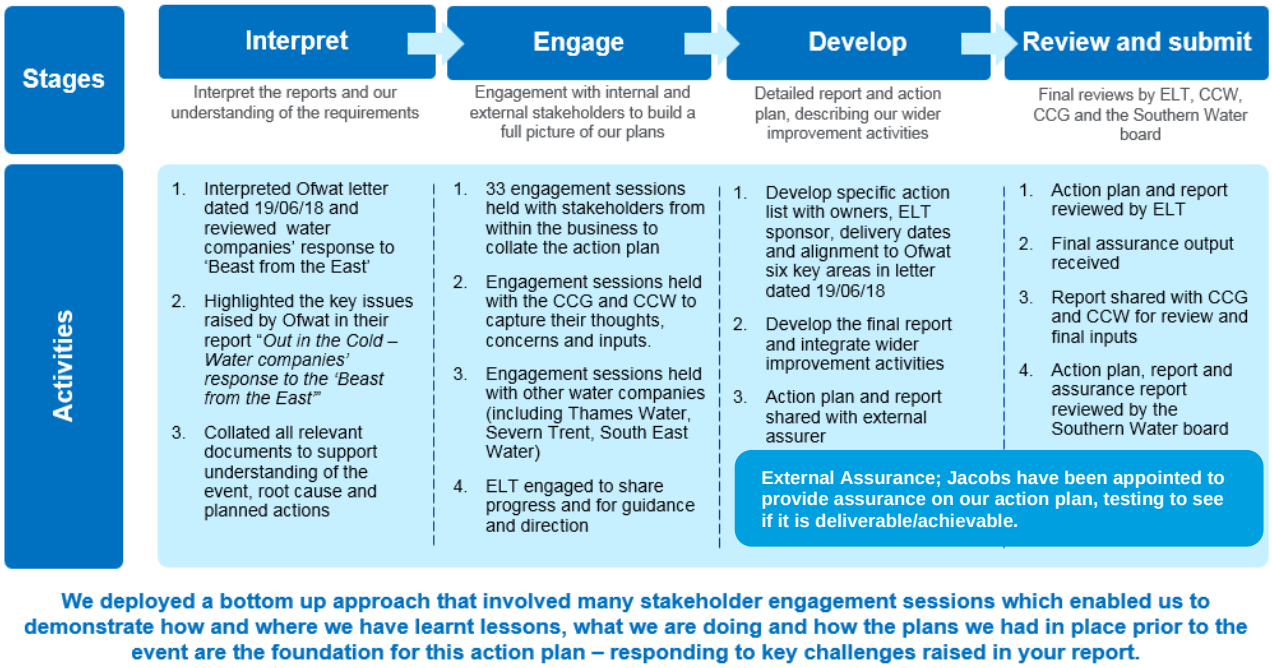

Figure 1.0 – our approach to developing the report

Key considerations in developing the report;

Before the freeze/thaw event

Southern Water had established a programme of transformation activities in 2017, recognising that improvements were needed in the service provided to its customers. Lessons learnt from previous incidents were in the process of being implemented into action plans, when the freeze/thaw event occurred. For example, we had already engaged Jim O'Connor to help improve our management of incidents and response to customers. Jim had been instrumental in establishing incident response improvements in Scottish Water and his experience has been invaluable in bringing lessons learnt from another organisation. Having already embarked upon the Water First initiative provided a head start in enhancing actions and activities to respond to the lessons from the freeze/thaw incident.

Wider internal and external engagement

A key element of our wider engagement approach was the high level of engagement internally and externally. Externally, we have engaged with the CCW and CCG (including Sussex Chamber of Commerce) to capture their inputs and in addition, we have discussed the Freeze/Thaw with our own customers through a customer research activity to understand their experience before, during and after the event. To ensure we share best practice, we have discussed our response with other water companies including Thames Water, Severn Trent and South East Water and we will continue to coordinate through Water UK.

As part of our incident management framework development, we have reviewed our end to end engagement processes and are working with our Local Resilience Forums. We have described in Appendix 6.0 the key lessons learnt from each engagement and how best practice has helped shape our actions.

Incorporating actions into existing improvement programmes

Our existing improvement programmes which were in flight prior to Freeze/Thaw have already delivered relevant capability improvements. In some cases, the improvement programmes needed to be accelerated or re-scoped to ensure we address the challenges we face.

Longer term transformation

These improvement programmes have provided a solid foundation to transform our business, delivering a step change in performance. They support our vision to create a resilient water future for customers in the South East, starting by being brilliant at the basics. The actions described in our plans are further strengthened in our PR19 Business Plan by our five transformational programmes.

External Assurance

The action plan and report have been externally assured by Jacobs who have said in their report; *"We consider that the plan appears to be deliverable with the resources identified, has clear ownership and accountability at a senior level and that it has been produced through a process with appropriate governance, controls and management scrutiny".*

1.2 Summary of our Action Plan

Responding directly to Ofwat's six key themes, we have developed a detailed action plan with over 100 actions, and approximately 40% of these actions have been completed. For every action, we have identified an action owner, executive owner, governance route and delivery date. A detailed action plan has been developed which specifically addresses the improvement areas. The detailed plan is available as a separate document and a summary view is provided in Figure 2.0 below.

Workstream	Business challenge identified	Action Plan
Planning and Preparation	Failed to anticipate the scale of the impact	Deliver improved forecasting and early warning capability
		Improve performance of network monitoring assets
	No contingencies for planned maintenance outages	Revise and ratify Safe Control Operations (SCO) process
	Delay in restoring supplies following power outages and asset unavailability	Rollout Operational Excellence Hubs in in all three regions Deliver brownout mitigation measures Deliver outage management plans
	Limited interconnectivity between supply systems	Deliver connectivity schemes and agree contingency connections with other companies
	Incident management framework not rolled out	Develop and rollout Operations incident management framework
Incident Response	Response was reactive and fell short	Embed Operations incident management framework, and update contingency plans
	Inadequate alternative supplies and logistics	Define strategy, increase alternative supply assets and water bottles, tender & award contract
Customer Comms	Reactive domestic and business customer comms	Improve proactive and incident communications content, process, systems and competence
	Customer calls went unanswered	Improve customer contact data, process & competence. Increase contact centre capacity
Stakeholder Comms	Communication with LRFs was patchy and reactive	Proactive collaboration with LRFs including co-creation of response plans
		Deliver coordination training to Incident Managers and Resilience Advisors
Vulnerable Customers	Approach was reactive and did not adequately identify or support vulnerable customers	Improve data, process and competence to enable rapid identification and engagement Deliver 'Support and Reach 'programme for a more accessible and aligned service
Compens-ation	Uncertainty of eligible customers, slow process	Improve identification of eligible customers and efficiency of payments(details awaited)
Other initiatives	Operational resilience	Complete Zonal Resilience assessment (Water)
	Organisational resilience	Rollout business-wide Security and Incident Mgt Framework (H&S, IT Business Continuity)

Figure 2.0 – summary action plan with owners

The action plan prioritises immediate key priorities which deliver meaningful results for our customers, and these critical short-term improvements are either complete or are scheduled for completion by December 2018.The summary timeline below represents the key delivery dates.

Many actions and improvements were previously identified through the Water First initiative, prior to the request from Ofwat to submit an action plan. As a result 40% of the actions are now completed with improvements embedded within our organisation.

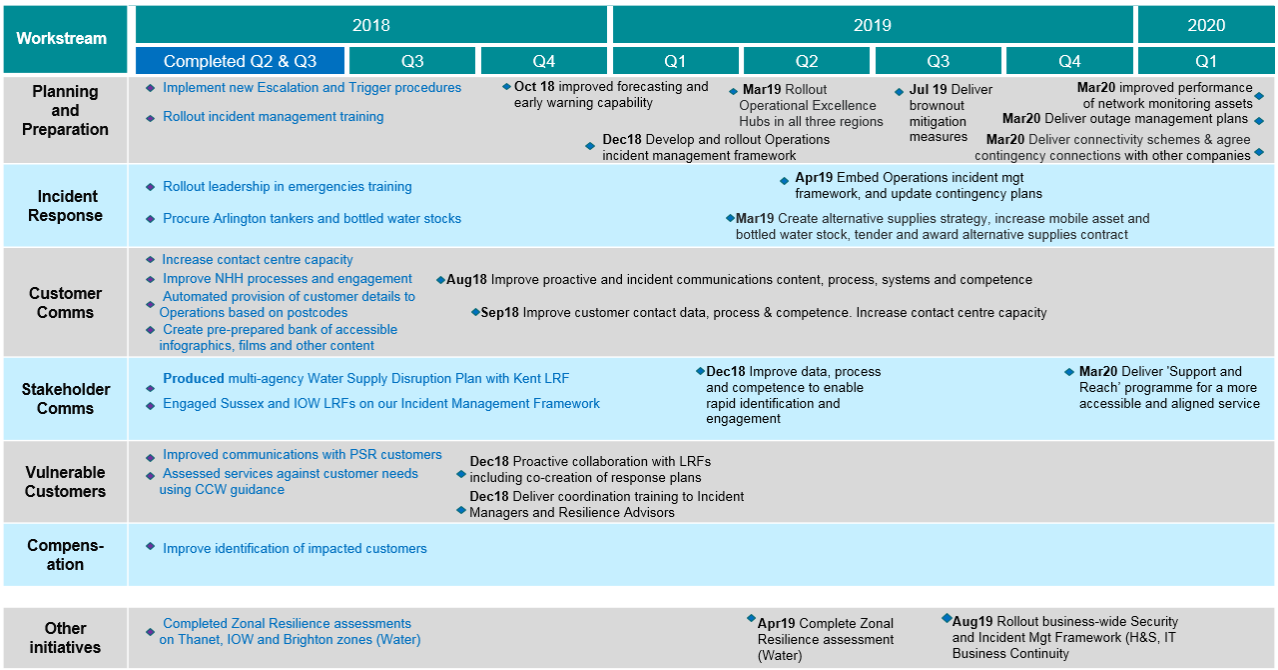

Figure 3.0 – summary timeline of action plan

Alignment with PR19 Business Plans

Our action plan and existing improvement programmes align well with our PR19 plans and resilience framework helping us to drive operational resilience improvement and applying a system of systems approach with an understanding of the customer outcomes. These initiatives have provided a solid foundation to transform our business, delivering a step change in performance. They support our vision to create a resilient water future for customers in the South East and starting by **being brilliant at the basics**. In addition, these improvement programmes and actions are further strengthened in our PR19 Business Plan by our five transformational programmes. We are committed to making the improvements in the action plan now and they are not dependent upon the outcome of the PR19 determination.

Ofwat report key themes and our response in summary

Ofwat's letter contained six key themes which have been used to structure our response and they are described in the following text:

Planning and preparation; failure to anticipate and prepare for the event.

Summary of our response; As part of our Water First programme, we have designed and deployed a reservoir forecasting tool to predict declines in reservoir levels. A new horizon scanning process to assess risks of extreme weather events as part of our new incident management framework is also being implemented.

In addition, we have invested in a smart networks scheme at Rownhams and as described in our PR19 business plan, we will continue this investment to drive overall performance in AMP 7 and beyond.

To better manage the power outages challenge, we have set up a 'brown out' working group to formalise our approach for remote re-start of supply sites and identify sites for pilot. Improvement to our emergency procedures have been completed and are now being implemented successfully in Weirwood WSW.

We have also participated in dry weather group calls across Waters Resources South-East to better understand trends of water resource levels in our region. We have participated in drought planning scenarios as an exercise to test the capacity of our service to respond to extreme events.

Incident response; response and insufficient supplies

Summary of our response; a new incident management framework is being implemented and embedded in the business. We started in September 2017 and have been working with an external consultant to bring in best practices from the Oil and gas industry. Our management of the summer heatwave is an example of how we have since improved our performance in managing extreme weather events.

In addition, we have increased our bottled water supply stocks from 430,000 litres to 610,000 litres, 210,000 of which are held directly in stock and available immediately and 400,000 held in stock on our behalf by Water Direct and available within four hours. In addition to the 610,000 litres in stock, a rolling stock of 200,000 litres is available to be called upon within 24 hours.

Customer communications; reactive domestic and business customer communications

Summary of our response; we recognise that our customers are all individuals with different needs and preferences. Following the event, we carried out our own customer research to better understand their needs and as part of our communications improvements. Furthermore, we want our customers to participate actively on an ongoing basis and we are developing a number of initiatives to enable that and ensure ongoing engagement. Working together with CCG, we will develop a Customer Action Group to focus on solution design and development. In addition to that, we will launch our incident tracking tool to identify the most successful engagement channel for our customers and once complete, our customer segmentation model would allow better tailoring of messages during an incident. In the short term, we have increased the number of fully trained and available staff by 100% and significantly increased the pool of staff available to field calls during incidents.

In December 2018, we will be hosting a crisis communications exercise with our media stakeholders to understand best approaches to sharing information and simplifying our messages.

As part of our Water First programme, we have automated our customer identification system helping us to more accurately pinpoint which customers may be impacted by the incident. To support our non-household customers, we have confirmed a new non-household incident management lead within our incident management framework and revised our engagement process and policy.

In addition, we have created a pre-prepared bank of infographics which can be distributed within 30 minutes of the event trigger. We recognise our online platform is key, hence by March 2019, we will have delivered the next stage of development bringing a more intuitive customer experience.

Stakeholder communications; communications with stakeholders was reactive

Summary of our response; our goal for stakeholder communications is to develop long-term relationships and build a culture of ongoing engagement. As part of our incident management framework development, we have reviewed our end to end engagement processes and are working with our Local Resilience Forums (LRFs - Kent, Sussex and Hampshire) to develop Water Supply Disruption plans, to be in place by March 2019.

The LRFs have also been engaged on development of our incident management framework. In addition, we have set up dedicated stakeholder panels to better understand our customers.

Vulnerable customers; approach did not adequately support vulnerable customers

Summary of our response; we have assessed the services we provide to our vulnerable customers against their needs using CCW guidance and our Support and Reach programme will address the challenges raised, scheduled to deliver and embed all its outputs by 2020. The key outcome is providing a better aligned service to customers and to make our services more accessible. It also includes setting up a customer inclusion panel with Age UK, Local Authorities and other stakeholders.

In the short term, we have provided refresher training to all our customer contact staff, cleansed our Priority Services register list and we are working with the Local Resilience Forums to develop water supply disruption plans which includes processes to identify vulnerable customers. This is being supported by the setup of multi-agency vulnerable cells within the LRF's.

Compensation; uncertainty of eligible customers

Summary of our response; we were proactive and one of the first organisations to identify impacted customers and make compensation payments in excess of the GSS compensation levels as described in Ofwat's letter from 19th June 2018. As part of the overall improvement in customer communications, we have completed improvements to identify customers due compensation.

Demonstrating improved performance during the summer 2018 heatwave
Some of the actions we have progressed such as our incident management framework have already had a significant impact during the summer heatwave.

During May to July 2018, the heatwave event, the second driest on record in England and Wales, caused a water shortage crisis across the UK due to lower than normal rainfall and soaring temperatures. For example, the Isle of Wight received 2% of normal rainfall in June. As a result, the levels in groundwater reserves were at 'severe drought' levels.

We took actions prior to the event to implement our early warning triggers using several factors including weather reports and demand data. Our newly implemented incident response structures with a standby team for monitoring and pre-planning were put in place as well as our new escalation procedures. Our preparedness with our alternative response meant that we had alternative bottled water supplies available on standby during the heatwave period. Early engagement with Local Resilience Forums demonstrated that we took a proactive approach with our stakeholders. Effective and frequent communication with DEFRA via weekly calls was also a great success.

During the event, we were able to successfully resolve the issue of low groundwater reserves in the Isle of Wight by pumping an extra 12 million litres a day from Hampshire via two large undersea pipes under the Solent that separates the Isle of Wight from the mainland of England. Our key water efficiency messages were delivered effectively to retailers and our business customers and we briefed national and regional journalists.

Customer benefits

The action plan delivers ten key elements of business improvement which are summarised in Figure 4.0. Each of these business improvements feeds directly into one of three customer benefits.

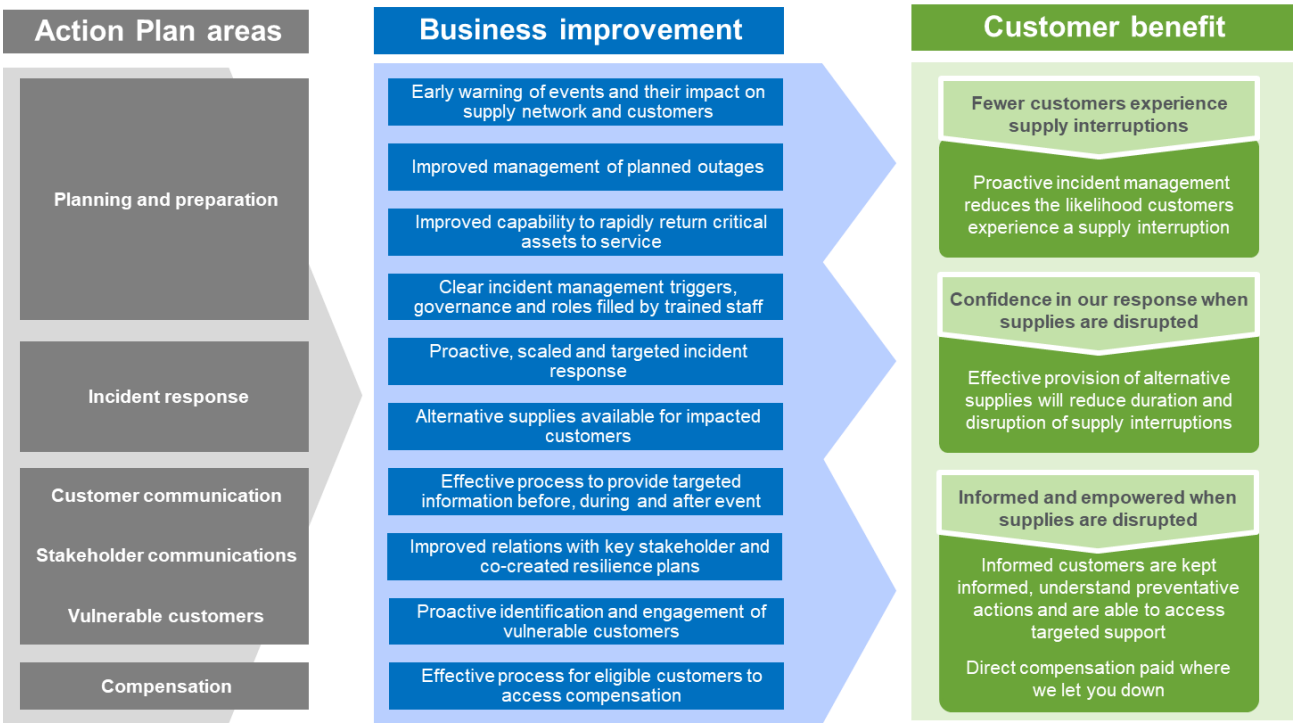

Figure 4.0 – customer benefits

- **Fewer customers experience supply interruptions**: proactive incident management reduces the likelihood customers experience a supply interruption
- **Confidence in our response when supplies are disrupted**: effective provision of alternative supplies will reduce duration and disruption caused by supply interruptions
- **Informed and empowered customers**: customers are kept informed, understand preventative actions they can take and are able to access support. Direct compensation is paid where we let customers down

2.0 Transforming our business

Our existing transformation programmes and key initiatives

As part of our transformation journey we have established two improvement programmes, Water First and Operational Excellence. These programmes have delivered capabilities which have improved our resilience to an adverse weather event particularly during the summer 2018 heatwave. We are re-scoping these programmes such that a significant amount of the action plan will be governed by the existing structures and processes within these programmes.

In addition, we have also carried out a benchmarking exercise on resilience, against the BS65000 standard to inform and direct the wider continuous improvement of resilience within our organisation.

Water First is a long-term improvement programme which started in 2017 and will continue into AMP7. It is helping us to be one of the most improved water and sewerage companies in the UK through a focus on improving our ways of working and embedding a public health culture at the heart of everything we do. It is embedding a more collaborative, effective and transparent work practice alongside improvements to our policies, processes and reporting. The programme is co-sponsored by the Directors of Wholesale Water and Compliance & Asset Resilience. Programme benefits include improvements in information analysis, culture and capability, and risk management. Appendix 3.0 shows the original scope of Water First and the outcomes it is intended to deliver.

Operational Excellence is developing the capability that will underpin stable, repeatable processes, simplify the way we work and focus our attention where it matters the most. Through this, we are improving teamwork, collaboration and coordination of activity. At the heart of our Operational Excellence approach are Performance Hubs where cross-functional teams come together to review performance, focus resources and systematically manage operational risk and target improvements. In February 2018 we launched pilot Hubs in Sussex, in both operations and maintenance for Water and Wastewater, and already this cross-directorate collaboration has resulted in reduced levels of plant out of action, fewer alarms and a reduction in the level of supply site outage caused to water quality shut down events. Over the coming 18 months we plan to implement over 80 performance hubs across our core operational teams in Water and Wastewater.

We will continue to embed Operational Excellence in AMP7 and anticipate these improved ways of working will continue to deliver productivity benefits, reduced compliance risk and improved employee engagement. It also lays the foundations for frontline innovation capability by providing the operational framework for developing and testing new ideas, assessing their impact on performance and sustaining their implementation. We will build on this with our **bluewave innovation programme**.

In addition to these programmes, two examples of major initiatives we are implementing are:

Incident management framework development which commenced in September 2017 with a purpose to improve our Operational incident management framework and emergency response. Through this, we have improved our relationship with the Local Resilience Forums and implemented new processes and procedures. Prior to the event, over 100 of our managers and senior managers had undergone training and a new ROTA system has been put in place to ensure we have the capacity and capabilities required to better manage such events in the future. The development of this has been supported by an external consultant with strong experience of preparing for and leading adverse weather events in Scotland. In addition, the newly designed framework brings best practice from beyond the sector, applying the Mission Command approach developed by the US Coastguard and incorporated into the US National Incident Management System. It is being adopted within the UK and widely used by the oil and gas industry across the world.

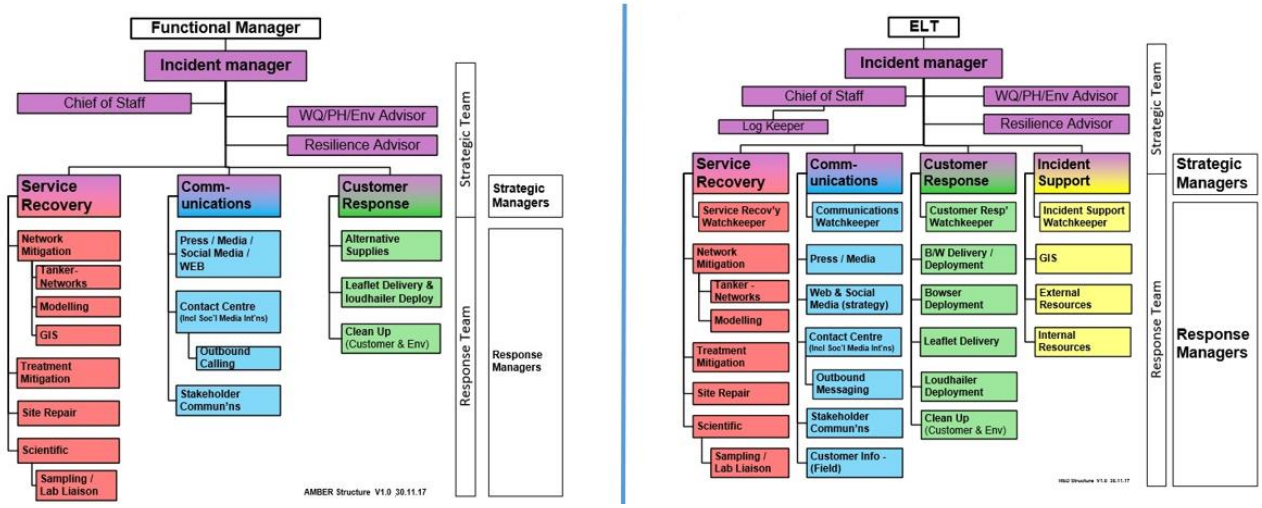

Figure 5.0 – unity of command – the new incident management framework

Zonal Resilience Assessment pilots commenced in October 2017 in the Thanet Water Supply Zone (WSZ). This is a consequence-led assessment to quantify resilience by developing metrics which help us understand potential outcomes of an extreme event, i.e. the number of properties (customers) potentially at risk in the event of a hazard occurring. The approach brings best practice from beyond sector, taking the J100 framework for resilience applied across utility sectors in the US and developed by the Department of Homeland Security and the UK cabinet Office 4R's of resilience combining these two approaches in a single methodology. We have since applied this in two further WSZ's and have a plan to roll this out to all WSZ's by end of May 2019. This will help us plan better, proactively identifying where our customers are most at risk within a WSZ and prioritising where we invest with a focus on customers. As an example, within our Water Horizons document and PR19 business plan (Chapter 11), we have described how this resilience quantification is helping to shape our future investment in Brighton WSZ to improve customer outcomes.

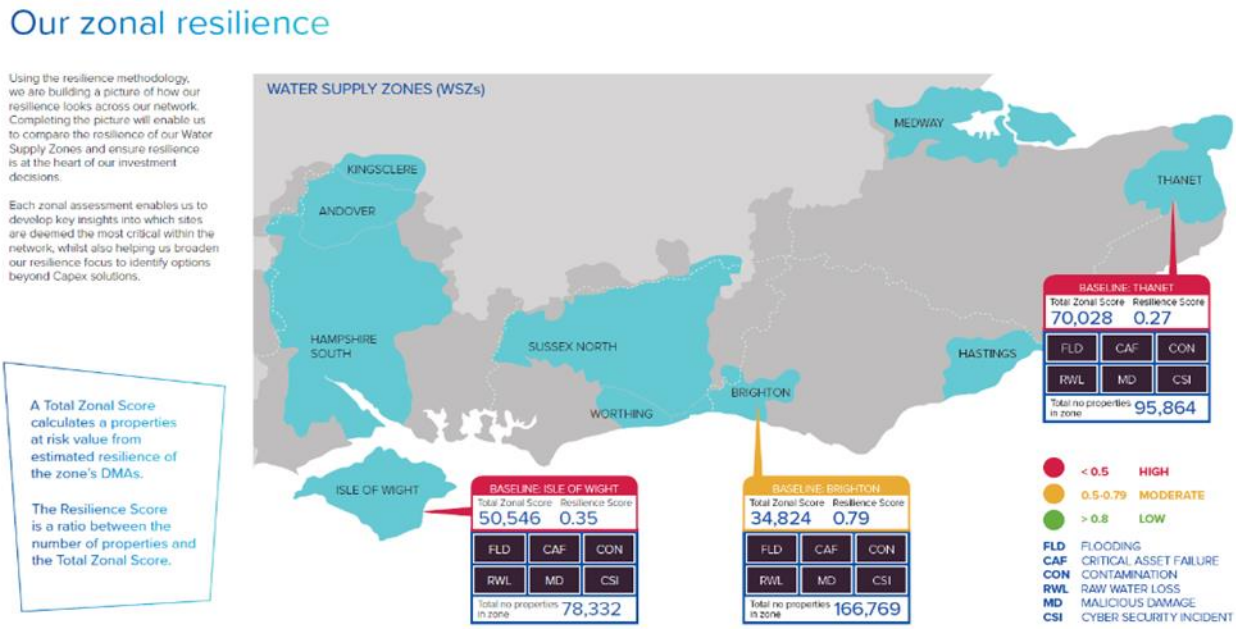

Figure 6.0 – zonal resilience assessment

Aligning to our longer-term Business Plan

The improvement programmes and frameworks described provide a solid foundation to transform our business, delivering a step change in performance, encouraging a more collaborative and system of systems approach, which are key elements of our resilience framework as described in our PR19 Business Plan.

The initiatives support our vision to create a resilient water future for customers in the South East, starting by **being brilliant at the basics**. The actions described in our plan is further strengthened in our PR19 Business Plan by our five transformational programmes.

Figure 7.0 – five transformational programmes in our PR19 business plan

Helping to move the sector

Southern Water is actively engaging in wider community initiatives and promoting the importance of water in a thriving and sustainable community.

The Greater Brighton Infrastructure Panel - Under the umbrella of the Greater Brighton region, an Infrastructure Panel brings together experts to discuss and promote new cutting-edge ways of maintaining energy and water supplies. Two working groups have been tasked to report back in January with proposals for new methods to cut use, reduce emissions while also keeping bills down for consumers.

> The panel's chairman, Chief Executive of Southern Water, Ian McAulay said:
> 'We need to make sure we build a resilient future for water and energy to allow us to continue to enable growth of the economy here in the South East.'

Water Futures 2050 – A longer term review of the industry developed and published jointly with Stantec (Southern Water's Strategic Solution Partner)

This strategic, long-term review explores the critical driving forces and 'high impact' uncertain variables within which Southern Water operates, from global to community levels. Interpreting how these may interact and play out over time creates the initial framework within which present-day decisions can begin to be made. Some macro-level variables, such as demographics, are relatively predictable. Others are highly uncertain. The changing relationships between them will have far-reaching and unpredictable consequences. The overarching challenge and opportunity is to create flexible strategies that will work in any future scenario, no matter how extreme.

The National Drought Group – Southern Water is an active member of the National Drought Group which was established as the period of dry weather extended into this summer. A strong focus on resilience and preparedness are clear ambitions for the group.

Some areas of learning we identified following our internal review

Our internal review of the Freeze/Thaw event helped in our understanding of the root causes and lessons learnt, the key areas of learning are aligned to those in the Ofwat report. Some areas of learning we identified include;

- **Communication** – delivering improvements already in flight to improve capacity and ability to reach our customers with consistent messages.
- **Early warning** – improvement in our capability to predict and prepare for extreme weather events.
- **Monitoring and escalation** – improvement in our ability to manage the consequence of the event.
- **Provision of alternative supplies** – improving our bottled water and alternative supply arrangements including improvements to alternative supply command on the incident management structure.
- **Liaisons and coordination with Resilience organisations** – build our relationships with the Local Resilience Forums.

3.0 The Freeze/Thaw event

Context

Following the Freeze/Thaw event in March 2018, Ofwat carried a review across the industry on how water companies responded to the event and worked with CCW to understand what happened, assess water company performance and make sure lessons are learnt and changes take place so that improvements are put in place for the future.

This review was published by Ofwat in the report "Out in the Cold" on 19th June 2018. On the same day individual letters were sent to affected water company CEO's including Southern Water. The CEO letter describes key areas where lessons need to be learnt and requires that Southern Water develop an externally assured action plan and submit this by 28th September 2018.

The Freeze/Thaw event

A period of cold weather persisted over the area supplied by Southern Water for a period from around the 21st February 2018 up to the Thursday 1st March. Daytime temperatures barely rose above zero degrees during the day and dropped to as low as minus seven degrees centigrade during the night.

Temperatures rose significantly from Thursday 1st March. By Saturday 3rd March demand in the water network rose dramatically resulting in a number of areas being under stress to meet the supply / demand balance. The situation was exacerbated in certain areas due to Weirwood Water Supply Works, which supplies part of Sussex, being off-line for refurbishment and a power cut (brown out) on the Saturday morning that affected many works in Kent and East Sussex. In addition, operational problems and restrictions on storage in the Hastings areas meant that the supply was vulnerable.

Consequently, 7,700 (0.33%) of our customers were without water for four hours and 2,246 (0.1%) of our customers were out of supply for up to three days over the period from mid-afternoon on Saturday 3rd March until late on Tuesday 6th March. Our field staff undoubtedly worked well to manage the system and repair bursts and keep as many areas in supply as they did.

4.0 Our action plan

We have provided here a description of our action plan against the headings within the “Out in the cold” report and Ofwat’s letter. The full list of actions is provided as an attachment.

Governance of actions

Each element of the action plan is shown against its executive owner (denoted on the summary action plan by the initials of the accountable director). The detailed list of actions provides details of the governance arrangements for each individual action. This governance route is the mechanism through which each action is planned, delivered and monitored. These governance arrangements are the means through which progress is reported and risks are escalated to the executive. The governance routes identified are:

- Water First and Operational Excellence transformation programmes
- Operational Resilience Steering Group
- Compliance and Asset Resilience Executive Leadership Team
- Water Leadership Team - Water Supply
- Asset Lifecycle Process (capital delivery process)
- Section 18 Steering Group

Planning and Preparation

A cornerstone of our planning capability is the Water Risk Framework, which governs how we identify risks to customers, prioritise improvement schemes to mitigate these risks and optimise solutions. The Water Risk Framework ensures our investments in the source-to-tap water supply system are targeted to improve resilience and reduce the impact of extreme events to our customers.

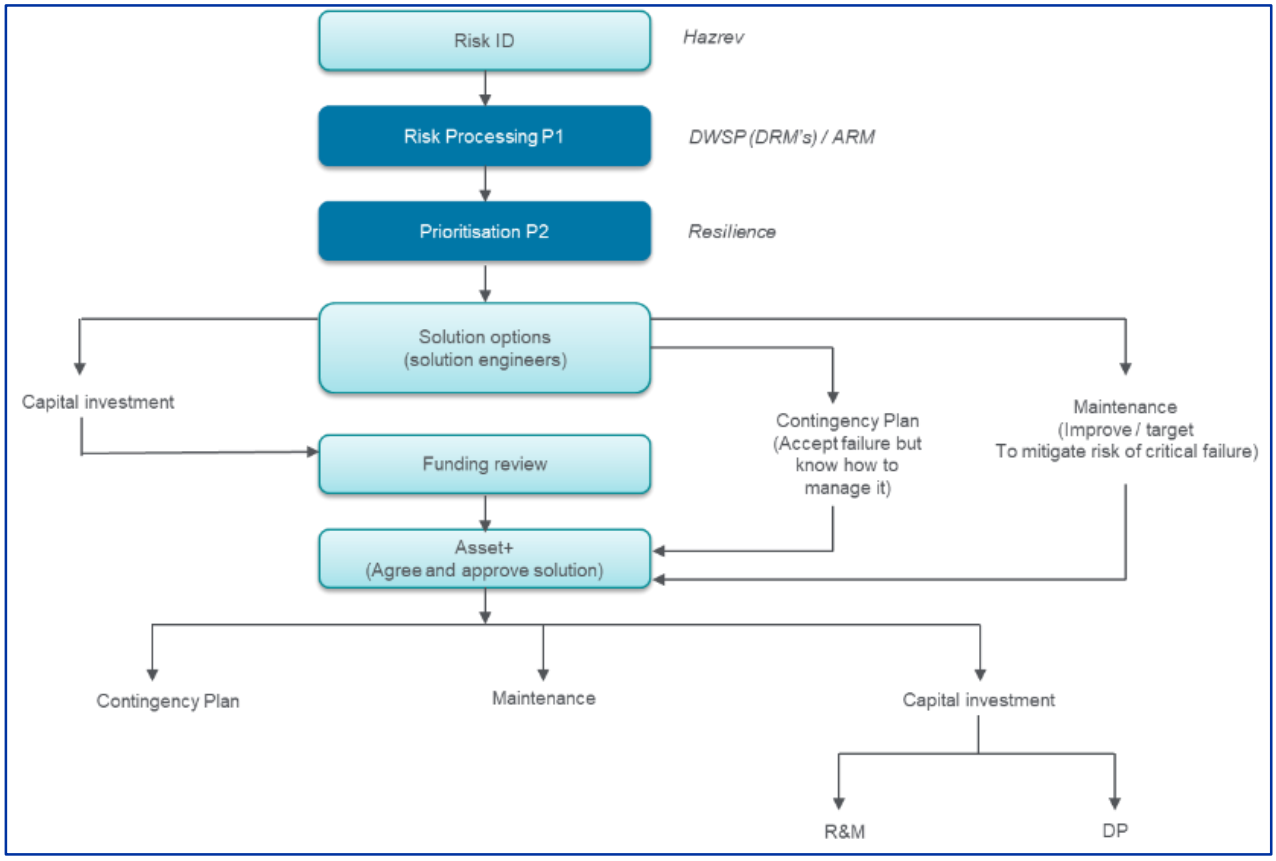

Figure 8.0 – conceptual view of the Water Risk Framework

The steps of the Water Risk Framework shown in figure 8.0 are continuously undergoing improvement. For example, the Hazard Review (HazRev) project, a key initiative of Water First, is undertaking an end-to-end review of asset performance at all supply sites, including an assessment of hazard containment and site recovery requirements. Through applying this framework approach we identified that additional funding would support the mitigation of key risks, and in December 2017 an additional £70m was allocated to the water portfolio budget to fund the mitigation of the requirements identified.

The following section summarises how we are further improving our planning and preparation capabilities against the sub-areas raised in Ofwat's report and letter.

Anticipation and preparation

Our early warning and monitoring system and key indicators, such as incoming customer calls, were not sufficiently joined up to enable us to plan and respond as effectively as we could. It meant that our cold weather continuity plans were not put in place early enough to fully mitigate the impact.

Improving our forecasting and monitoring capability through better information

As part of our Water First transformation programme, we have designed and deployed a Reservoir Forecasting Tool to predict declines in reservoir levels using the most recent demand data, with a feature to understand trends. Daily company storage reports are now produced by area which helps us understand how we are keeping up with demand. Going forward, we will integrate this information into our PRISM system for near real time monitoring of overall supply-demand balance. This will provide data to help us understand storage levels and provide rolling 24 hours changes in volume by area. This is a step change compared to our current daily monitoring and it will be in place and fully embedded by end of October 2018.

More broadly, we are implementing a new horizon scanning process to assess risks of extreme events. This process will be owned by our incident management team and will be aligned to our temperature impact assessment and the resilience assessment approach currently being deployed in our Water business to understand where customers are at risk of losing supply against hazardous events. The horizon scanning and temperature impact assessments will be in place by end of October 2018 and the resilience assessment will be rolled out to all water zones out by April 2019. This assessment will also support our investment planning.

We are also improving our source to tap connectivity mapping and improving our GIS mapping coordinates for abstraction points, water treatment works, supply points, reservoirs, zonal boundaries and area of appointment to a scale of 1.50,000. This will reduce the margin of error in our forecasting capability and ensure we are less reliant on individual knowledge. This will be delivered by end of September 2018.

Continued investment in our assets to improve our forecasting and monitoring capability

As part of our Water First programme, we have invested in a Smart Networks pilot scheme at Rownhams to increase network asset intelligence and use artificial intelligence learning to refine approach and prioritise where we invest. This pilot will be completed in 2020 and in our 2020-2025 Business Plan we have described how we will continue to invest in smart networks to drive our overall performance in AMP7 and beyond. We have described how we will bring together a single integrated approach for managing our water network and embrace latest technologies to improve our understanding and management of our assets.

In AMP6, we are reviewing and reprioritising our capital maintenance plan to ensure the most critical network monitoring assets provide the required flow data

Restoring supplies following power outages and asset unavailability

Our ability to respond effectively to the Freeze/Thaw event was further diminished by the power outages (brown outs) experienced in Kent in the early hours of Saturday 3rd March 2018 which

interrupted production levels across the area for a period, and in the case of Burham WSW, a strategic supply in Kent, for up to 18.5 hours. This was at the same time as demand was increasing significantly due to a combination of burst mains and customer-side leakage. Power interruptions (brown outs) are not an uncommon issue, particularly in the Medway supply area in Kent.

Managing unplanned outage risks (brown outs)

A brown out working group has been setup to investigate and formalise our approach for remote re-start of supply sites and identify sites for pilot implementation, which will be completed in October 2018. We expect this to reduce the time taken to re-start a site significantly and it will be rolled out to all critical sites by end of June 2019. This critical activity is now part of our Water First programme.

We will work with the industry to understand how the energy providers can be held accountable for resolving brown out issues and collaborate with the Water industry on remote re-start, particularly where there may be any water quality concerns.

Emergency planning procedures for planned maintenance outages

Prior to the event our emergency response planning was maturing. We were developing a new incident management framework with the support of Jim O'Connor, previously Head of Emergency Planning & Security at Scottish Water, who has direct experience of the challenges faced in the management of several severe freeze events. The new incident management framework (including emergency planning) was not completely rolled out at the time of the event. However, we had trained 120 managers and senior managers between January and February 2018 and the programme was progressing well.

We are carrying out a review of our Safe Control Operations (SCO) process to more effectively consider emergency planning requirements for significant and major site works, including a clear and specific focus on mitigating measures. There are also ongoing measures we have put in place to ensure all necessary internal and supply chain staff are compliant with the process.

To sustain changes and support our continuous improvement activities in this area, our Operational Excellence programme is driving cultural change, improving how we share information to support effective operation and maintenance of our assets, resulting in better risk management and improved resilience. Given the successes we have experienced we are working to roll out the Team Performance Hubs in Central, East and West regions by March 2020.

In Sussex, Turners Hill is under normal operations, supported by Weirwood Water Supply Works (WSW) and supported by Hardham WSW, however Weirwood (WSW) had been taken out of production to allow a major refurbishment of the plant to be undertaken. The plant was shut down in November 2017 and was scheduled to be recommissioned in June 2018. This period of closure was chosen given highest demand is normally in the summer months. Unfortunately, during the event, this contributed to 3,500 properties being out of supply for about 10 hours.

Weirwood WSW Alternative response – how we are successfully applying our planning procedures; Weirwood WSW in Sussex North WSZ is currently out of service due to the ongoing delivery of a programme of improvement actions. The planned works at Weirwood will make the site considerably more resilient by installing chemical dosing installation, enhancing turbidity monitoring and improving control panel interfaces. We have mobilised a cross-functional team including Planning and Resilience, Water Quality, Operations and delivery partners to focus on the completion of these works and return the site to service as a priority project.

For the duration of these works we have implemented an existing operational plan to ensure customer supplies remain unaffected and our preparedness for adverse weather is not compromised. We are supporting Turners Hill WSR using Hardham WSW and Hampers Lane WBS/WSR via Buchan Hill WSR, and are maintaining levels in all WSRs at above 80% wherever possible. We will utilise a bulk supply from Portsmouth to Hardham WSW when demand is forecast

to rise. This bulk supply is typically operated at 1 M/ld but will be increased to 15 Ml/d during periods of high forecast demand.

We continue to closely monitor the potential risks which the works at Weirwood may pose to our customers and a daily situational overview is provided by the Duty Manager. If any incident triggers are met, our escalation process as described in the Alternate Response timeline will be enacted. We have developed a specific resilience plan for Weirwood WSW, that normally supplies Turners Hill reservoir and in excess of 30,000 people, a summary of which is provided below.

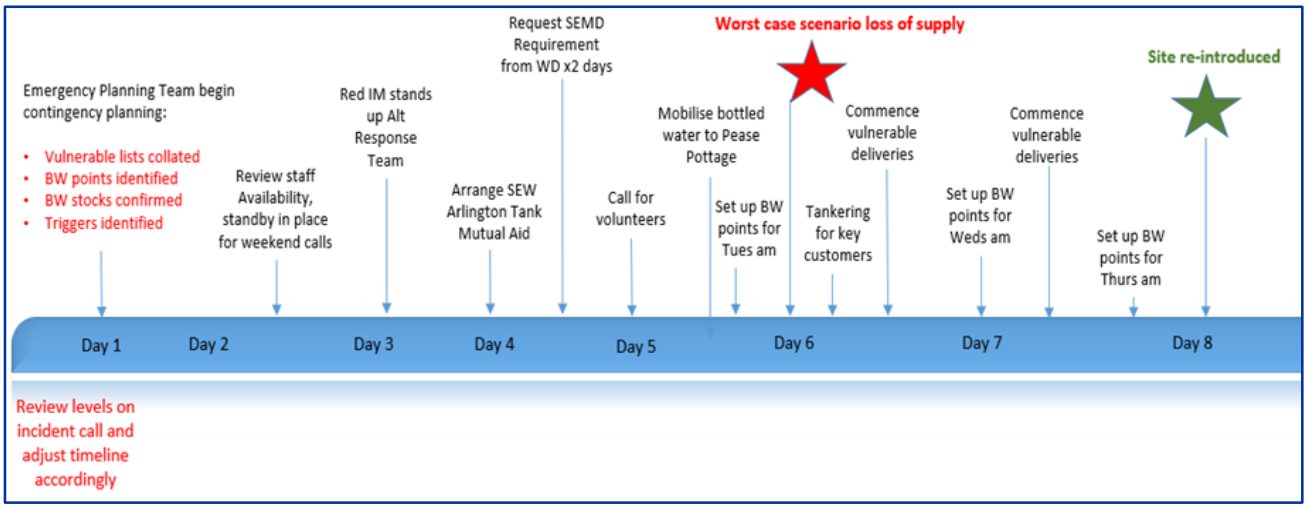

Figure 9.0 – alternate response timeline

In the case of an extreme weather event, there is a specific and detailed emergency response plan, that has been produced in April for Turners Hill WSR. The key elements of this contingency plan include:

- Three bottled water distribution points that can be used to make water available to our customers when the supply will be restored soon. These locations are centrally located and are ideal for bulk deliveries.
- 18 additional distribution points venues, which have been agreed with Crawley Borough Council to be utilised.
- 195 bowser deployment locations in the event that all DMA's from Turners Hill WSR are out of supply and this incident becomes protracted and it is necessary for static tanks (bowsers) to be deployed to provide water.
- 182 limited stock pallets of bottled water located at Timsbury and Burham, which will be used to provide water to our Priority Services customers.
- 208 pallets of bottled water that can be mobilised from our contracted bottled water supplier in the event of a major incident.
- Provision of supplies to 31 key customers including one hospital and seven schools, who would be unable to attend a water distribution point to collect water
- A red incident would be declared under the incident management plan after a loss of supply from Hardham WSW due to the number of customers served by Turners Hill WSR

Connectivity between supply systems

We acknowledge that with better interconnectivity between our different supply systems and improved network monitoring the impact on our customers could have been reduced. While many areas were put under considerable stress, most customers did not experience a loss of supply. The areas that did suffer a loss had additional contributing factors including the loss of power, reduced treatment capacity, or reduced storage capacity due to water quality issues.

However, our planning approach relied upon systems which provide lagging data such as Prism, LMARS and Watercore. As this information was not near real time it did not enable us to be as proactive as we should have been.

There are ongoing activities to improve our asset connectivity, including Phase 1 of the WRMP Hardham Winter Transfer scheme. In addition, the Gaters Mill scheme, which will improve connectivity with Portsmouth Water, will be available in manual operation in September 2018 and automated by the end of AMP6.

More broadly, prior to the Freeze/Thaw event, we were, through the Water Resources Management Plan (WRMP) process, identifying, appraising and selecting schemes to improve the interconnectivity of our water resources zones and with neighbouring water companies to provide additional resilience to drought events as well as other incidents which impact supply availability. For example, in our draft WRMP submitted to Defra in December 2017, we included a new grid system in Hampshire to allow supplies to be transferred between our water resources zones in south and north Hampshire. We also included a new transfer pipeline in East Kent enabling us to import supplies from South East Water, to provide us with additional supply in drought and to provide resilience to other incidents. Following the Freeze/Thaw incident and the public consultation on the draft WRMP between March to May 2018 we have looked to increase the level of resilience in our revised draft WRMP by seeking further inter-connections with neighbouring water companies where possible. Consequently we have included a new scheme to import water from Bournemouth Water into our south Hampshire supply area and we have committed to investigate the opportunities for further transfers in future.

In the short to medium term, we are improving how we capture and monitor reservoir levels to ensure there is near real time information. Mid to longer term, we are engaging with South East Water and other neighbours to identify viable locations for inter-company connections to provide contingency resource options. As described in our Water Resource Management Plan, we will also work collaboratively with water companies in the South East to deliver more connected and resilient supply system.

Incident management procedures

As previously described, prior to the event we identified the need to improve our incident management framework including our procedures. Our programme of improvements started in September 2017. However, the process was not fully embedded, we were moving through the next phase to identify staff to fill in the roles within the new structure and there had not been an opportunity to go through full consultation with our employees. In addition, a planned exercise to test the procedures and provide identified staff with an opportunity to practice the procedures was scheduled for the 23rd March 2018 but had to be postponed due to the Freeze/Thaw event.

We have continued to progress with the roll out of the incident management framework in Operations and this is due to complete by the end of 2018. This work has been supported by Jim O'Connor who has brought in best practice experience from Scottish Water, applying methods and approaches being used in the Oil and Gas industry and developed by the US Military.

We have reviewed our categorisation of incidents and developed triggers, establishing thresholds that reflect the appropriate level of response. The trigger and escalation procedures have been implemented and training has been rolled out across Operations. We are currently carrying out consultation on the new Area Manager ROTA which is expected to be completed by early September 2018 and embedded by February 2019 across our business.

Ahead of that, we are testing our incident management response structure in an exercise at the end of September 2018 to ensure it is fit for purpose and to learn lessons to help us continue to improve.

Other ongoing improvements we are making include a review of our contingency plans, development and roll out of our new adverse weather plan and roll out of standby arrangements for incident response teams. These activities will be completed by March 2019.

Taking lessons from the Freeze/Thaw we have expanded our planning function to include county-based emergency planners and Subject Matter Experts and by January 2019 we will have rolled out and delivered role-specific training to our Water Network field event co-ordinators on the new rota.

Incident Response

Our incident response framework

As described previously, the delivery of our new incident management framework has been accelerated and is being embedded across the business to ensure we are better placed to manage extreme weather events in the future. We are also reviewing our business-wide approach to business continuity and incident management.

A key part of this is a new appointment who is now responsible for the business-wide incident management capability and is building a team applying industry best practice approaches.

Members of our executive team have recently received training on industry best practices for leading an incident response and we are committed to continuous learning and improvement through wider collaboration directly with other water companies to share best practices and through Water UK.

Using data to drive a proactive response

As part of our Water First transformational programme (within the Customer Contact workstream), our Production Planning team is improving how we capture and monitor our reservoir levels by calculating the historic average demand profile for each reservoir. This information can be used in the short to medium term as key reference information during an incident – it creates new data sets and utilises existing data to generate useful insight to support incident response more proactively.

This capability is due to be in place by November 2018 and it aligns with our longer-term solution for Smart Network monitoring as described in our PR19 Business Plan. As part of this improvement, we will also investigate how we can incorporate historic average reservoir demand profiles as alarms on our PRISM system. This solution will be in place by March 2019.

Our people during an incident

We typically experience strong support from our people during an incident, but we recognise the need to do more and put structures in place to ensure our culture and processes promote the most effective response.

We have completed several initiatives to embed capability improvements within our business. These include delivering incident training across the business, including the first wave of volunteer pool training to provide surge support during an incident. Key volunteer training activities for specific roles have been identified and training will be completed by end of October 2018. Our Workplace system (a “social media” for work places) has now been deployed and will expedite the communication of key messages to our colleagues in the future, which is a key part of the innovative approaches we are putting in place to continue to build a more resilient culture within our business.

We have also reviewed how we organise ourselves, and we are increasing the capacity of our field response team to attend reservoir and booster sites during an incident in order to reduce response time. This programme will be completed in September 2018.

Our processes (during an incident)

We have reviewed our procedures and our updated incident management procedures will be rolled out fully by December 2018. Our situational monitoring procedures will be in place by October 2018, and this is being driven and delivered by our Operational Control team.

In addition, we are working with our Delivery partners to agree a live repair approach and roll this out by August 2019.

These activities form part of our Water First programme, for which there is a clear governance structure and executive leadership commitment to help drive outcomes and secure a more resilient water and wastewater system for our customers.

Alternative supplies

We recognise the immediate challenges faced during the event were further exacerbated by ongoing improvements to incident management that were not yet fully embedded in the business. We also recognise our approach to providing alternative supplies fell short, including failing to ensure sufficient bottled water supplies reached affected customers when they needed them.

We have taken immediate action to increase our bottled water supply from 430,000 litres to 610,000 litres, 210,000 of which is held directly in stock and available immediately and 400,000 held in stock on our behalf by Water Direct and available within four hours. In addition to the 610,000 litres in stock, a rolling stock of 200,000 litres is also available to be called upon within 24 hours every 24 hours.

Our experience during the event was similar to others in the industry who use the same supplier and we are reviewing our contract position with Water Direct. Gaps have already been identified with the capacity and capability of Water Direct to sufficiently support us during an extreme weather event. We will work collaboratively with others in the industry to fully review our requirements and we plan to have a new contract in place by September 2019. In the short term, we have procured six Arlington tankers to maintain supply during an emergency or whilst planned works are ongoing. The training on use of the Arlington tanks will be completed for all field operators in each county by end of October 2018.

To support this deployment, we have completed an update of the Alternative Supplies strategy and plan which covers tankering, bowsers/Arlington tanks and bottled water. This will also include how we work with key stakeholders including Mutual Aid and Local Resilience Forums. As part of the wider incident management framework development, we are already working with the Local Resilience Forums.

As part of this strategy and as of end of August 2018, we now have pre-identified bottled water distribution points, starting in Crawley in conjunction with WSCC and going forward we will put in a risk-based process to roll out bottled water distribution points in other strategic and critical locations.

Stakeholder Communications

Enhancing our communications by building better relationships with our stakeholders

Our goal for stakeholder communications is to develop long-term relationships and build a culture of ongoing engagement.

As part of our incident management framework development, we have reviewed our end to end engagement processes and are working with our Local Resilience Forums (LRFs - Kent, Sussex and Hampshire) to develop Water Supply Disruption plans, to be in place by March 2019. The LRFs have also been engaged on development of our incident management framework. We are building

much closer relationships with our LRFs, proactively working on joint plans through our emergency planning practitioners, which enables better future communications. To continue to reinforce our messages longer term, we have engaged with our LRF's to sponsor community resilience events – this initiative has been rolled out by Sussex Resilience Forum and it is being adopted widely as best practice. This roll out will be completed in October 2018.

In addition, we have created strategic and tactical coordination groups, consisting principally of Southern Water incident managers and resilience advisors. They are undergoing training which is due to be completed in November 2018 and December 2018 respectively.

We have improved the content to be shared with stakeholders during an event, and we have created a bank of accessible media materials and content for use under various agreed scenarios. When incident triggers are reached we now have effective processes to rapidly share this information with key stakeholders, promoting a joined-up response and enabling stakeholders to share these messages further.

We have sought to clarify our role on the Water UK Mutual Aid Scheme and will continue to work with Water UK and lead on this as part of its review of the Mutual Aid. We will support this review at the meeting on the 19th September 2018.

Customer Communications

We recognise that the strength of our relationship with our customers is vital and we are making wider improvements beyond Freeze/Thaw to transform how we operate with and better engage our customers. Starting by recognising our customers as individuals, we are introducing customer journeys, team restructuring and dedicated stakeholder panels. We are driving a step change in how we communicate, and it is in recognition of this that we carried out our own research following the Freeze/Thaw to better understand our customers experiences, needs and preferences.

Our customer research

It is vital we use our insight and accurate customer data to communicate through a range of different channels and provide a range of targeted, accurate and accessible content during an incident. As part of our learning from the supply interruption events in February and March 2018 we ran some research to get the direct views from customers who had been impacted. We already knew that supply interruption is a high priority for our customers and that the impact can be very different depending on the individual circumstances of the customer. So, we designed the research around the customer to ensure we could gather this informed view. We used qualitative techniques to get to the depth of insight we needed. We ran two focus groups with customers in Sittingbourne and Hastings and recruited a spread of customer types and duration of the interruption, from 16hrs up to 53hrs. We used pre-tasks to capture individual perceptions ahead of the research and to aid recall of the event, so it was top of mind. In addition, we boosted with an additional 2 depth interviews with customers from our Priority Services Register (we had aimed for more but were unable to recruit with the sample available), so we could better understand their induvial circumstances and the impact of the event.

> *"The modern functions need water, you need to drink, you go to the loo - everything is water based so if you haven't got it... If the lights are not on, it doesn't matter, you can have a candle. If the gas is not on, use electricity. There's always an option but with water, slightly different."*
> Sittingbourne Customer

Our Insight

Customers want their water service to be reliable, so **unexpected interruptions can cause significant inconvenience or distress, especially when it occurs at critical times to customers'**

circumstances. During the event customers used a range of coping mechanisms such as using electric heaters (when the boiler does not work), having a shower at work or choosing meals that don't require much washing up.

Customers feel it should be part of Southern Water's ethos to help facilitate a community response and to ensure the reach of our support is available to the most vulnerable. They would prefer a cautious/realistic message to allow them to plan for the worst.

In response to the February and March interruptions **customers were generally understanding of the severe conditions that Southern Water faced. They were largely happy with the engineering response to resolving the supply interruption** and had sympathy for the people on the ground fixing the problem.

However, they felt **there was some disconnect between the central contact centre and on-the-ground teams**. At the time customers required more proactive information about the situation and clarity on the support offered. It was felt that the replacement supplies of bottle water were inconsistent and considered slow, with the need for more clearer signposting for vulnerable customers about how to get support during an interruption.

When an interruption event does occur, clear communication is the primary need for our customers. Customers are looking for proactive information about the situation:

- To understand what has happened and why
- To have clarity on resolution to understand when the issue will be fixed
- Guidance on what support they might receive and how

"[We wanted] communication, especially to someone that's vulnerable, so that they can make decisions on how much water they need to get in, and to me it's the early warning which is more important than anything else." Priority Service Register Customer, Hastings

Active participation of our customers in how we design our solutions

One of the key feedback themes from our engagement with the CCG is active customer participation, we also want to ensure that our engagement is beyond the customer research and to that end, we are developing a number of initiatives to respond directly to this feedback.

Customer Action Group: focusing on incident management – this is as proposed in our Future Engagement & Participation Strategy for PR19.

We will recruit panels of customers to participate in the design of solutions. Our plan is that each time solutions move into delivery, the panel reconvenes with new members, with the group actively participating in language, tone and messaging. All those recruited would be customers who have had incidents in the past and we would regularly review members to refresh with customers who have had interruptions more recently.

Southern Water and CCG would directly engage with the group. The output would be to co-create communications, evaluate and refine proposed solutions and help identify new opportunities within communities to ensure we can provide the right messaging and support when an incident occurs.

This would be launched in November 2018, and we will follow up with a review and develop (with CCG) in February 2019.

Customer segmentation

As part of our customer segmentation currently in development we will build a dimension that identifies customers' capability to manage with an interruption to supply. This will be based on issues such as vulnerability but also support network and location of accessible services.

Using this dimension we will then be able to tailor and focus our efforts across those customers most at need of support and look to pre-engage those customers who would be most at risk with pre-emptive educational communications and advice.

Customer segmentation is currently in development and due to complete in March 2019 (however, we could run a temporary segmentation based on our insight from the action group and launch this in December 2018).

Incident tracking

Following any major incidents we would use our new business as usual insight programme to actively engage customers in the moment of an incident occurring. We are building a brief and internally approved approach, which will be co-created with the CCG, that means when an incident happens we would launch insight immediately.

By running this incident tracking we are able to monitor and inform the success of improvements of solutions to customers, placing focus on those most successful.

We would work to co-create this with CCG by December 2018 and lunch in February 2019.

Our capacity to manage calls during an incident

As part of a reorganisation within the business, we have completed a restructure of our customer contact teams, merging our operations and billing teams. This has increased the number of fully trained and available staff by 100% and significantly increased the pool of staff available to field calls during incidents.

We have trained the new combined teams on proactive outbound calls and emergency planning. By the end of September 2018 our social media volunteer pool from the customer contact team will have completed their training to support extreme events.

Enabling proactive Customer contact before and during an event

As part of our Water First programme, we have automated the process which identifies customers by their post codes and improved the visibility of this information to incident management staff. This means incident teams have continuous access to details of affected customers which enhances our communications and operational response.

We can now quickly identify which customers are likely to be impacted prior to/during an event and proactively contact at-risk customers to provide advice and facilitate access to alternative water supplies if required.

In addition, we have created a pre-prepared bank of infographics, films and other accessible content for use under various agreed scenarios. These are available for distribution through print, broadcast, online and social media, and we have embedded a process whereby content can be distributed to communication channels and media outlets within 30 minutes of the event trigger.

All our critical media content will be cloud based by end of September 2018 which provides capability to access and share media content with our partners and agencies very quickly. To ensure we have the confidence that information we send out during an event is reaching its target audience, we have procured a service to help track issues and media coverage on a continual basis during an incident.

Enhancing our online platforms

We have improved our website content management system to make it easier for anyone to find incident information and provide a more intuitive customer experience, including the addition of incident banners, a map frame clearly showing affected areas, and Twitter feed.

By March 2019 we will have delivered the next stage of our website development which brings associated website content into one place, provides suggestions of related content, and delivers a more intuitive customer experience.

Working with our media partners – continuous improvement

To further improve engagement and relationships with media stakeholders, in December 2018 we will be hosting a crisis communications exercise where we will work with media outlets to understand the best approaches to sharing information and simplifying our messages. The feedback from this event will be fed into our Incident Management Framework as part of our continuous improvement process.

Non-household customers

To support our non-household customers, we have confirmed a new incident management lead within our Incident Management Framework and revised our engagement process and policy. In addition, we have formalised our process to hold calls with retailers prior to, during and after events, to support retailers in publishing the right messages at the right time. Also, as part of our ongoing working relationship, we provide retailers with regular bulletins on water resources.

We will be working with the industry through Water UK to collaboratively improve our protocols for interaction with retailers and customers. Together we will clarify what powers we have during an incident and we also believe there is a role for Ofwat to play to provide further clarification and build a more robust working framework for the future.

Vulnerable Customers

We have assessed the services we provide to our vulnerable customers against their needs using CCW guidance and are developing a strategy to address the challenges we have identified. More broadly, we have a programme called Support and Reach which will address the challenges raised, scheduled to deliver and embed all its outputs by 2020. The key outcome is providing a better aligned service to customers and make our services more accessible. Key strands of this programme includes;

- **Data;** we are revising our existing Priority Service Register (PSR) ensuring the information is up to date by cleansing our data, identifying gaps, reviewing the training needs based on new data and developing appropriate communications materials to support. This is an ongoing activity beyond our Support and Reach programme and we will complete a first revision by the end of 2018. In addition to that, we will work with EDF and SSEN on cross-sector data sharing trials (whilst also complying fully with GDPR).
- **Support services;** we are integrating water efficiency offering into our vulnerable customer package and developing a protocol for offering water efficiency visits.
- **Delivering with partners;** we are implementing a community engagement strategy and working with other water companies to align social tariff.

- **Improved processes;** as previously mentioned, we are bringing in a customer journey approach.
- **Evaluation;** we are setting up regular reporting to ensure ongoing monitoring.

In addition, we are setting up a customer inclusion panel with Age UK, Local Authorities and other stakeholders.

The challenges we face on the PSR are industry wide, so we are developing bilateral data sharing agreements with relevant utility companies as described above and other organisations. We will also continue to collaborate through Water UK to develop a utility wide Priority Services Register. By 2020, we aim to have aligned the Needs codes to reflect those agreed through Water UK and the energy/water working group.

In parallel to our data cleansing work and to ensure our PSR list is up to date, we are deploying a refresher training programme to ensure our Customer contact centre staff can continue to identify potential vulnerable customers. In addition to that, we have strengthened links between our operations centre and customer services teams to ensure a smoother approach to helping our vulnerable customers during an incident.

As part of our work with the Local Resilience Forums (LRF), in July 2018 we completed development of Water Supply Disruption plans. Included in these plans are processes to identify vulnerable customers. This is being supported by the setup of multi-agency vulnerable cells within the LRF's.

Compensation

Southern Water, we were proactive and one of the first organisations to identify impacted customers and make compensation payments in excess of the GSS compensation levels, as observed in Ofwat's letter on 19th June 2018.

Additional payments to schools were aligned to STEM (science, technology, engineering and maths) subjects, a programme we understand has potential to support future local and national economy.

Our compensation process is transparent and available on our company website. We will continue to improve the awareness that our customers have of this process and contribute actively to the consultation on the GSS process Ofwat has recently initiated.

In March 2018, after the Freeze/Thaw conditions had ceased, a burst main on the Isle of Wight caused a supply interruption. We have a clear process in place, managed through the Operational Services function, to ensure that customer properties identified as affected by an interruption to supply are logged, and analysis is undertaken where an event is in excess of three hours. As this incident was not related to the Freeze/Thaw event, the compensation claims were managed separately, however there was a delay in handing details over to our Customer Service directorate for compensation payments to be made. A review of the existing process will be completed by the end of November 2018 which will ensure that appropriate governance control points are in place. In the meantime, we have put in place a new approach to further improve identification of impacted customers.

Appendices

1.0 Action plan (a separate attachment)
2.0 External Assurance Report (submitted separately to Ofwat)
3.0 Water first programme
4.0 Operational excellence programme
5.0 Zonal resilience assessments
6.0 Examples of how our engagement has shaped our action plan and response
7.0 Collaboration with other water companies

Glossary

Appendix 3.0 – Water First

Our Water First improvement programme is driving us towards becoming one of the most improved water and sewerage companies in the UK by improving our ways of working and embedding a public health culture at the heart of everything we do.

The Water First approach is to embed more collaborative, effective and transparent working practices alongside delivering improvements to our policies, processes and reporting which reduce operational risk and improve the experience of our customers.

As a result of capability improvements delivered through the Water First improvement programme:

- **We will be in an ideal position to achieve Upper Quartile performance for the Compliance Risk Index (CRI) in AMP7 and become an industry leader on CRI by 2030 and beyond.**
- **We will also become an Upper Quartile company for interruptions to supply and significantly increase our resilience.**
- **We will have the ability to analyse performance in real time to predictively identify future interventions.**
- **We will have embedded water quality awareness and public health training across the company.**

Appendix 4.0 – Operational Excellence

The Operational Excellence programme will improve our customer experience by promoting collaborative working to improve the reliability of our supply works and networks. Our Performance Hubs will accelerate and sustain collaborative and evidence-based problem solving by building the capacity of operational managers.

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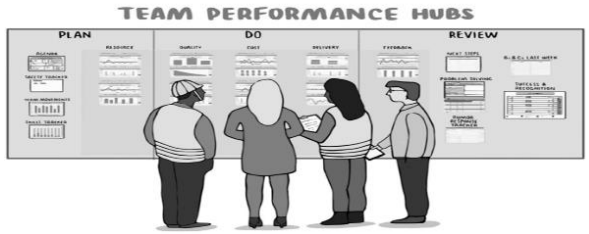
The 12-week site implementation plan provides support by Operational Excellence team members for the first 8 weeks and the last 4 weeks are leader-led. Through the Hubs, we are helping frontline managers to get the best from their teams and prioritise activity.



The Hubs promote and embed improved working practices such as effective meeting management, collaborative problem-solving techniques and regular Plan-Do-Review cycles to monitor performance and ensure new ideas are tested and implemented.

Specific outcomes from the trials of Performance Hubs undertaken with teams from water and wastewater include:

- **Water Treatment Centre alarms activation reducing by 50% and the average age of unresolved alarms reducing by 60%**
- **Visibility of critical asset condition improving and informing operational and maintenance priorities**
- **Significant reductions in potential ammonia and turbidity issues at sewage treatment centres**
- **Water Treatment Centre alarms reducing by 50% and the average age of alarms down by 60%**
- **A 50% reduction in water quality shut down events and improving adherence of water production plans to within 1% of target**

Appendix 5.0 – Zonal Resilience – Brighton Case Study

The Resilience Assessment of Brighton WSZ has been completed using the Southern Water Resilience Assessment Procedure document.

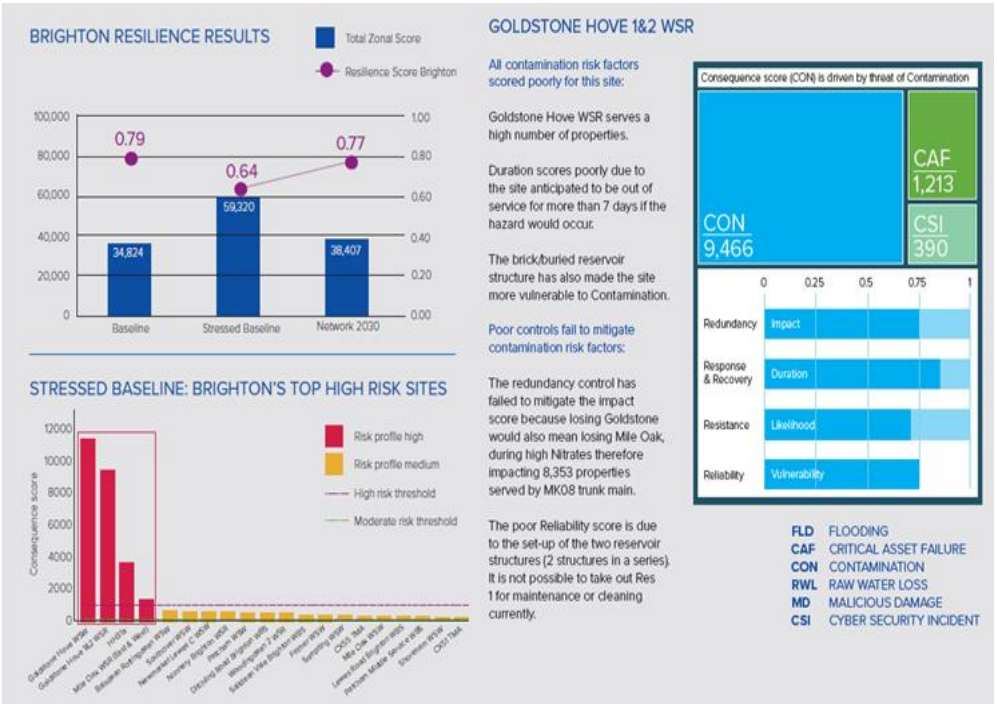
Our methodology frames resilience within a risk and controls environment and uses a customer outcome metric to understand resilience.

A number of extreme hazard events are considered in this assessment using different scenarios.

It enables us to better understand the risk drivers, i.e. scale of impact, duration, likelihood or vulnerability, and target appropriate resilience, i.e. the four Rs of Resilience are Redundancy, Response & Recovery, Resistance and Reliability.

Brighton's resilience does worsen under a scenario of high nitrates and high demand, but the overall interconnectivity of the network (Redundancy) has a moderate to good ability to cope with these stresses.

The results show that most of the total zonal risk is being driven by Goldstone Hove WSW and WSR. This is largely driven by limited connection between Middle Service and the MK High Service area, and the limited capacity to blend with Mile Oak WSW during high nitrates and high demand. Installing a new booster station near Locks Hill valve could significantly improve Brighton's overall resilience even further.



Appendix 6.0 – Examples of how our engagement has shaped our action plan and response.

Who	Key lessons / share	Examples of areas where this engagement and the lessons learnt has shaped our response
Local Resilience Forums	- Better planning and preparation - Improved communication	As part of our incident management framework development, we have reviewed our end to end engagement processes and are working with our Local Resilience Forums (LRFs - Kent, Sussex and Hampshire) to **develop Water Supply Disruption plans**, to be in place by March 2019. The LRFs have also been engaged on development of our incident management framework. We are building much closer relationships with our LRFs, proactively working on joint plans through our emergency planning practitioners, which enables better future communication – ***this is a key lesson from our Freeze/Thaw internal review.*** To continue to reinforce our messages longer term, we have engaged with our LRF's to sponsor community resilience events – this initiative has been rolled out by Sussex Resilience Forum and it is being adopted widely as best practice. This roll out will be completed in October 2018.
CCG (including the Sussex Chamber of Commerce) and CCW	- Improved communication - better support for vulnerable customers - Active participation of customers	As part of a reorganisation within the business, we have completed a restructure of our customer contact teams, merging our operations and billing teams. This has increased the number of fully trained and available staff by 100% and significantly increased the pool of staff available to field calls during incidents. Furthermore, we want our customers to participate actively on an ongoing basis and we are developing a number of initiatives to enable that and ensure ongoing engagement. Working together with CCG, we will develop a Customer Action Group to focus on solution design and development. In addition to that, we will launch our incident tracking tool to identify the most successful engagement channel for our customers and once complete, our customer segmentation model would allow better tailoring of messages during an incident. We are revising our existing Priority Service Register (PSR) ensuring the information is up to date by cleansing our data, identifying gaps, reviewing the training needs based on new data and developing appropriate communications materials to support. This is an ongoing activity beyond our Support and Reach programme and we will complete a first revision by the end of 2018. In addition to that, we will work with EDF and SSEN on cross-sector data sharing trials (whilst also complying fully with GDPR).
Jim O'Connor	- Improved incident management structure - Better preparation for extreme events not just Freeze/Thaw	To develop our new incident management framework, we have been working with Jim O'Connor, previously Head of Emergency Planning & Security at Scottish Water, who has direct experience of the challenges faced in the management of several severe freeze events. In addition, the newly designed framework brings best practice from beyond the sector, applying the Mission Command approach developed by the US Coastguard and incorporated into the US National Incident Management System, it is being adopted within the UK and widely used by the oil and gas industry across the world.

Thames Water, Severn Trent Water, South East Water	- Considering incidents broader than Freeze/Thaw	We engaged with other organisations (Thames Water, Severn Trent Water, South East Water) to understand their approaches to improvement post Freeze/Thaw – key areas we all agreed on are; - the improvements should focus on events beyond Freeze/thaw. - to further collaborate beyond Ofwat response and work with the Water UK on the interdependencies with the Power/energy industry particularly on power outages, vulnerable customers (priority services register)

Appendix 7.0 – Collaboration with other water companies.

Collaboration has occurred between a number of the water companies impacted by the Freeze/Thaw event, Southern Water engaged with South East Water on the 18th July 2018, Thames Water on the 21st August 2018 and Severn Trent Water on the 3rd September 2018 to share our approaches and lessons.

Plans and approaches have been discussed between water companies and as an initiative to maintain proactive collaboration a number of actions have been agreed as listed below, with each topic being owned by one of the companies.

1. **Customer Communications** including winter lagging campaigns and crisis communications – **Lead: South East Water**
2. **Situational Awareness** covering use of data and visualisation techniques to better support decision making and identification of impacted customers – **Lead: Severn Trent Water**
3. **PSR / Vulnerable Customers** including collaboration with other utilities / service providers and practical innovation to increase coverage and level of support – **Lead: Thames Water**
4. **Regional Collaboration and the establishment of a Regional Gold Command** for Water Resources South East – **Lead: Southern Water**

Glossary

Abbreviation	Definition
AMP	Asset Management Plan - the five-year period covered by our business plan.
CCG	Customer Challenge Group - an independent group of customer representatives and stakeholders that advises, provides challenge and assurance to our plans for us on the quality of our customer engagement.
CCW	Consumer Council for Water - a group that represents water and sewerage consumers in England and Wales and takes up unresolved complaints.
DEFRA	The Department for Environment, Food and Rural Affairs - Government department responsible for safeguarding our natural environment, supporting our world-leading food and farming industry, and sustaining a thriving rural economy.
DMA	District Metering Areas - a defined area of a water distribution network.
EDF	Électricité de France Energy - energy company that provides electricity generation and the sale of gas and electricity to homes and businesses throughout the United Kingdom.
ELT	Executive Leadership Team - Leadership team in Southern Water.
GDPR	General Data Protection Regulation - a regulation in EU law on data protection and privacy for all individuals within the European Union and the European Economic Area.
GIS	Geographic Information System - a computer-based tool that analyses, stores, manipulates and visualizes geographic information in a map format.
GSS	Guaranteed Standards Scheme - compensation that is paid to our customers when we fail to meet the minimum standard of service
HAZREV	Hazard Review - a fully integrated review of catchment and operational and asset based hazards of assets.
LMARS	Leakage Monitoring and Reporting System - a programme used by our leakage team to retrieve data from flow loggers.
LRFs	Local Resilience Forums - a group which plans and prepares for localised incidents and catastrophic emergencies.
PR19	Price Review 2019 – process that will set prices for water customers for the period 2020 to 2025. The last Price Review was held in 2014 and was therefore known as PR14.
PRISM	A visual network management tool that is used to understand the supply-demand balance of our reservoirs in real-time. It shows metres depth, % level full and calculated storage and includes a calculated rolling 24 hour change in volume storage by reservoir and area.

PSR	Priority Service Register - A list of our customers who have self-registered as requiring priority service during an incident, e.g. unable to attend a water distribution point to collect water.
SCO	Safe Control Operations - Process which considers emergency planning requirements for significant and major site works, including new levels of sign-off for alternative supply plans and mitigation measures
SME	Subject Matter Experts - Individuals within our company with specific knowledge and experience of a topic.
SSEN	Scottish and Southern Electricity Networks - Energy company that provides both electricity transmission and electricity distribution to 3.7 million homes in central southern England and north of Scotland.
STEM	Science, Technology, Engineering and Mathematics - Subject areas
WBS	Water Booster Station - A pumping station that pumps water directly into a system or distribution network.
WRMP	Water Resources Management Plan - our 25 year plan that sets out how we will maintain balance between the demand for water in our supply area against the available water supplies, while ensuring that the environment is protected.
WSCC	West Sussex County Council - the local authority for West Sussex.
WSR	Water Service Reservoir - a storage of water that provides a suitable reserve of treated water to supply the shortfall in our distribution system.
WSW	Water Supply Works - a site which treats raw water and supplies potable water into our distribution network
WSZ	Water Supply Zone - a zone that represents the drinking water supply areas within the Southern Water region.