

Southern Water: December 2022 freeze thaw

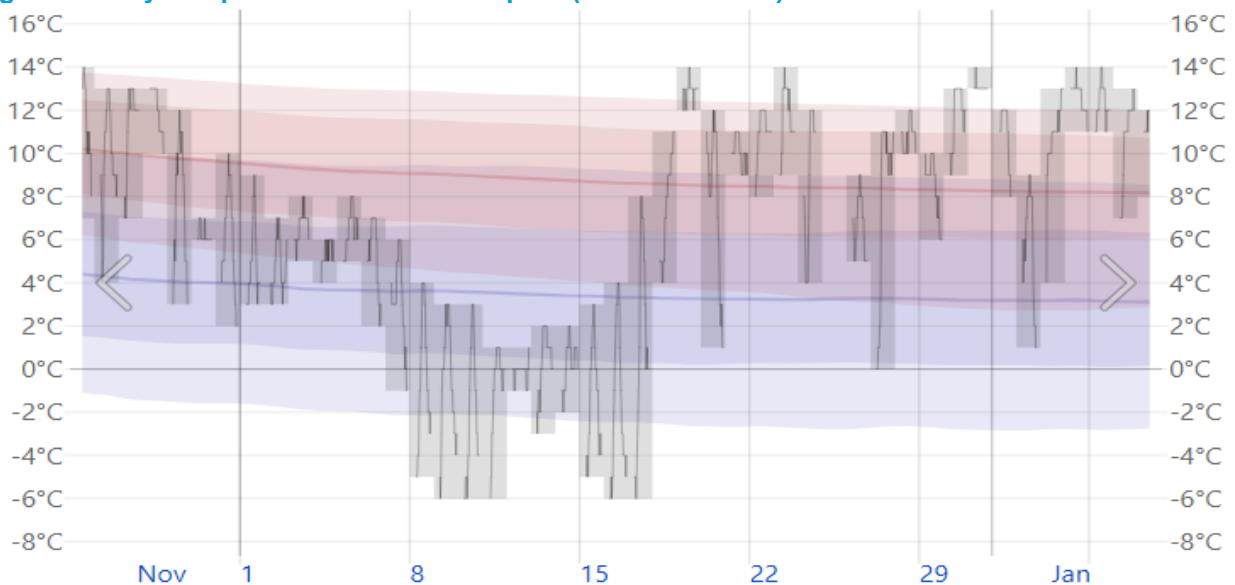
a) Details of the impact of the freeze thaw in your company area, including: underlying causes of any impacts; numbers of properties and customers experiencing problems; length of time to resolve outages; etc.

1. Underlying causes of impacts

A significant freeze thaw event occurred between the 14th and 19th December 2022. A 'Level 3' cold weather alert was issued by the UK Health Security Agency on 5th December 2022 ending at midnight on Sunday 18th December 2022¹. During this period, the Southern Water region saw a low temperature of minus 6°C, which was quickly followed by a rapid rise in temperature to 14°C in the days before Christmas.

The extremes of temperature can be seen clearly in Figure 1 below, which shows the daily temperature for Southampton in December 2022. The faint red line represents the average daily high temperature, and the faint blue line represents the average daily low temperature. The chart shows a low of minus 6°C on the 17th December, followed by a high of 14°C on the 19th December, both of which are well outside of the average temperature ranges for December.

Figure 1: Daily Temperatures for Southampton (December 2022)



Source: [Southampton December 2022 Historical Weather Data \(United Kingdom\) - Weather Spark](#)

¹ <https://www.gov.uk/government/news/cold-weather-alert-issued-by-ukhsa>

2. Impact of freezing and thawing on water infrastructure and demand

Such rapid fluctuations in temperature can cause water mains to leak, crack or burst. This is due to the pipes expanding and contracting with the large temperature changes. Table 1 shows our burst mains per month for the years 2021-22 and 2021-22. In December 2022 we saw an increase of 368 bursts compared with the previous month, which meant we struggled to meet customer demand due to the increase in leakage.

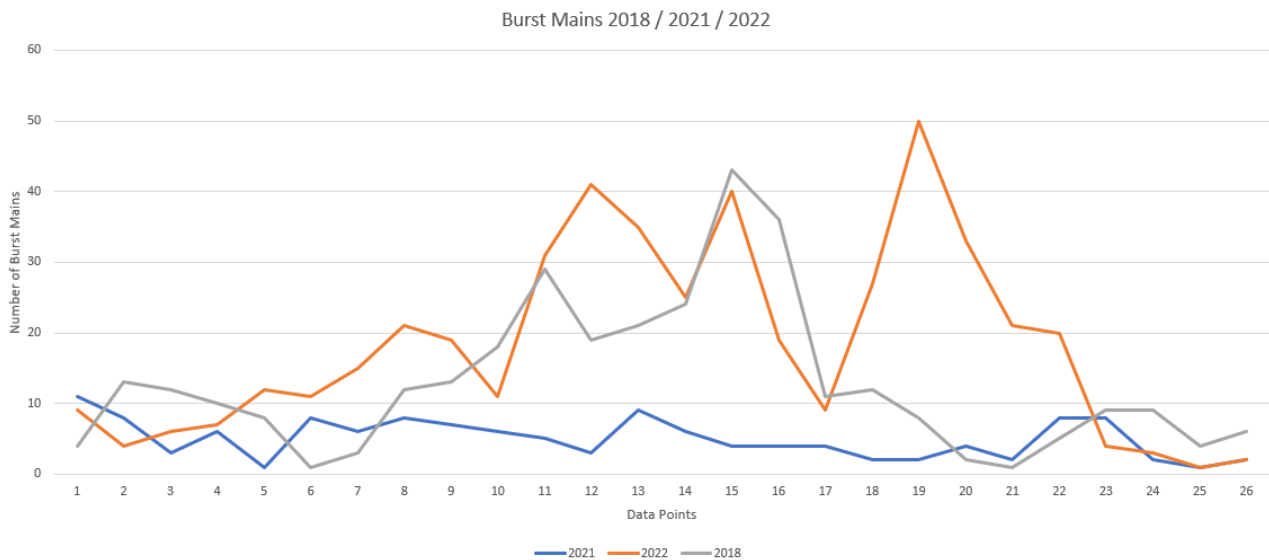
Table 1: Cumulative burst mains per month

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2021-22	120	202	312	417	515	624	725	862	1,002	1,186	1,292	1,383
2022-23	80	159	250	396	618	812	955	1,083	1,451	-	-	-

The number of bursts that occurred peaked on the 20th December with 50 being recorded on that day. The volume then continued to fall after this date until we saw a return to business-as-usual numbers at the end of the month.

For comparison, Figure 2 below shows the number of bursts recorded during December for the years 2018, 2021 and 2022. The highest volume of bursts we experienced in a 24-hour period in 2021 was on the 1st December 2021. On that day, we experienced 11 bursts, which was significantly less than what we experienced in December 2022.

Figure 2: Recorded number of bursts for December 2018, December 2021 and December 2022



As a result of the level of mains bursts experienced, during December 2022 we had a peak water demand of 647 MI/d on one day. This is above our typical peak August demand of 642 MI/d. December daily demand was, on average, 33 MI above the 2021 daily average for December. This pattern of higher demand was seen across all three of our supply areas, as shown in Figures 3-5 below.

The 'Beast from the East' freeze thaw event in 2018 saw a maximum peak flow of 700 Megalitres/day on the 3rd of March, above the 647 MI/d we saw in December 2022.

Figure 3: Western area demand

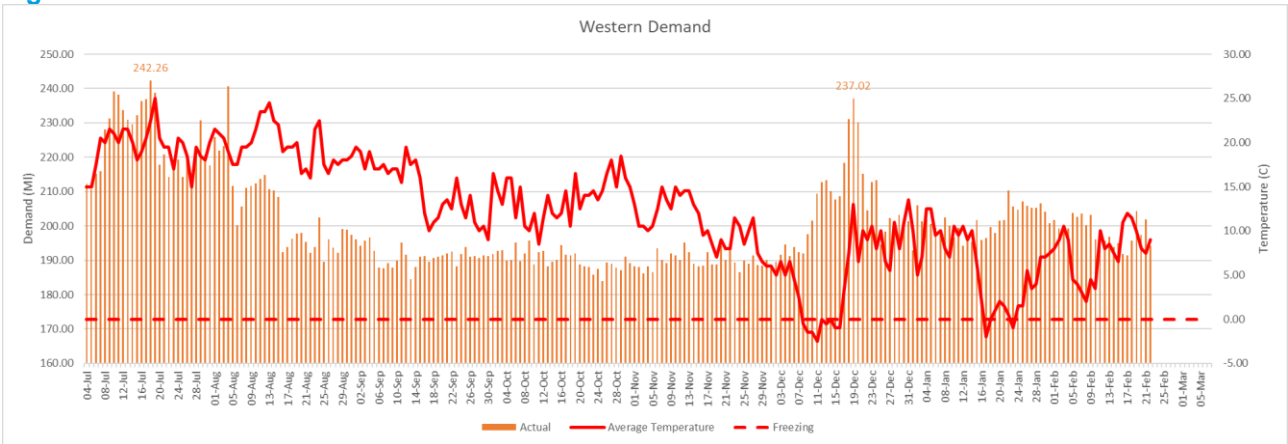


Figure 4: Central area demand

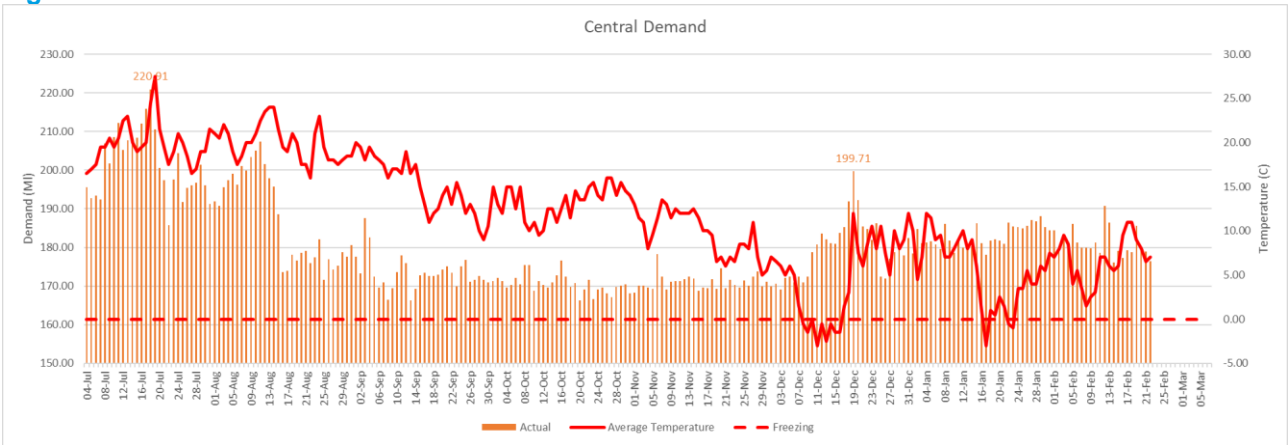
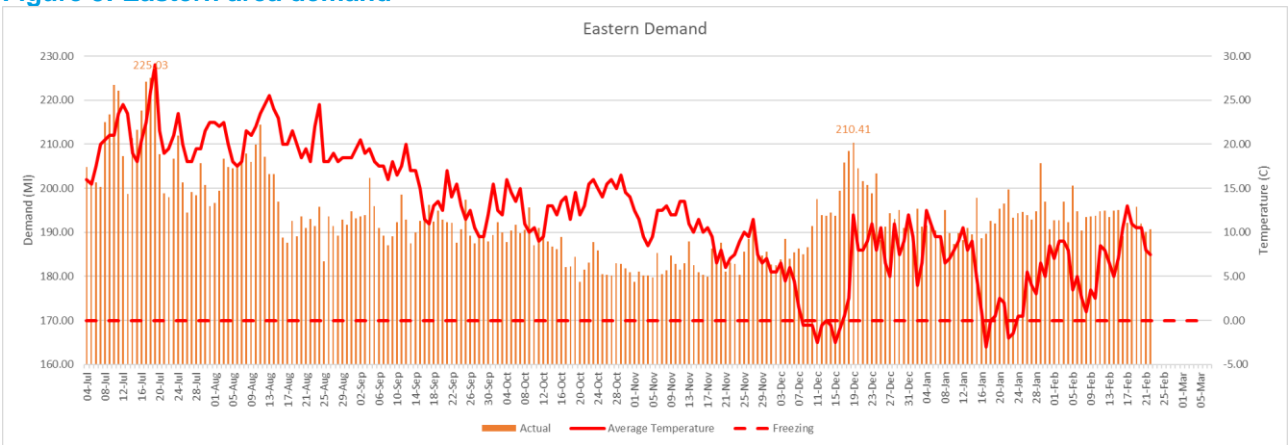


Figure 5: Eastern area demand



During this incident, we had 26,405 customer contacts, which is significantly higher than the comparative time in December 2021 where we had 14,165 contacts. We also had c.13,000 contacts and mentions on social media, again far higher than our average level of contacts which is c 2,000 a month.

3. Impact on services to customers

During this freeze thaw period, we had two large customer supply interruptions, one in Broadstairs, Kent and the other in South Hampshire.

(a) Broadstairs

On the 19th of December just before 4am, we suffered a significant burst main in Broadstairs in Kent, with the water backfilling into the service reservoir.

The burst happened on Southern Water land around the Rumfields Tower and flooded the external areas of some nearby properties. This incident was not due to the freeze thaw but was caused by a fracture on a 15-inch main, which could have occurred at any time. The attending Field Performance Manager confirmed that they believe the burst was a result of corrosion due to ageing infrastructure.

Figure 6: Photo of the burst main



The burst led to supply disruption to 19,000 properties, either with an immediate loss of water or significantly reduced pressure. We also identified 3,302 Priority Services Register (PSR) customers for bottled water delivery. Customers were back into supply as the network recharged at 2pm on 20th December.

(b) South Hampshire

The only large-scale incident linked to freeze-thaw was in South Hampshire.

The incident impacted a total of 10,620 customers, for a duration of up to 48 hours (with two customers being impacted for 72 hours). The total number of customers, and the duration of the interruption they experienced, can be seen in Tables 2 and 3 below, which shows the GSS payments made to our household and non-household customers in respect of the incident in Hampshire.

Table 2: Hampshire Interruption to supply – households

	GSS payment	Total no. households	Total payments
12 hours	£30	898	£26,940
24 hours	£60	2,096	£125,760
36 hours	£90	2,034	£183,060
48 hours	£120	3,768	£452,160
60 hours	£150	0	£0
72 hours	£180	1	£180
Total		8,797	£788,100

Table 3: Hampshire Interruption to supply – non-households

	GSS payment	Total no. non-households	Total payments
12 hours	£75	299	£22,425
24 hours	£150	285	£42,750
36 hours	£225	806	£181,350
48 hours	£300	432	£129,600
60 hours	£375	0	£0
72 hours	£450	1	£450
Total		1,823	£376,575

These customer interruptions were a result of demand outstripping supply because of elevated leakage from burst mains. Tables 4 and 5 below show the daily water demand for 2021 and 2022 respectively, along with the reservoir storage position. The day of maximum water demand during December 2022 was only 5.3 Ml/d below that of the peak demand seen in the summer heatwave. Although our storage position of 74% was below our target of 75-80% at the start of this incident, it was significantly better than it was during the 2018 freeze thaw event when they were at c.60%.

Table 4: 2021 Demand, abstraction and storage figures for Hampshire South

2021								
Date	Demand				Abstraction			Hants South %
	HSE	HSW	Rural	Winch	Testwood	Ott GW	Ott SW	
12/12/2021	82.71	32.48	6.99	17.98	50.31	35.94	23.13	80
13/12/2021	82.65	31.87	7.22	17.45	50.70	34.16	23.01	80
14/12/2021	80.44	32.01	6.97	17.69	50.28	31.77	23.06	80
15/12/2021	79.06	31.80	6.55	17.46	50.21	32.90	22.98	83
16/12/2021	80.11	31.83	6.89	17.50	49.49	33.24	23.01	84
17/12/2021	80.15	31.49	6.81	17.75	51.69	35.10	23.06	84
18/12/2021	78.99	31.41	6.96	16.97	50.57	32.45	23.12	85
19/12/2021	79.32	31.34	6.88	17.48	47.57	28.70	23.14	86
20/12/2021	80.82	31.70	7.05	17.33	51.40	33.23	22.35	84
21/12/2021	81.17	32.01	7.01	17.28	50.29	33.43	23.31	84
22/12/2021	79.04	32.08	7.08	17.43	51.90	30.16	23.36	85
23/12/2021	79.97	32.29	7.12	17.33	50.56	32.13	23.29	84
24/12/2021	80.25	33.34	7.41	17.72	49.74	35.39	23.21	83
25/12/2021	70.00	30.04	6.66	15.97	48.65	37.76	18.13	84
26/12/2021	73.45	30.43	6.94	16.37	46.39	31.44	17.86	87

Table 5: 2022 Demand, abstraction, and storage figures for Hampshire South

Date	Demand				Abstraction			Hants South %
	HSE	HSW	Rural	Winch	Testwood	Ott GW	Ott SW	
12/12/2022	88.94	38.37	7.50	20.39	55.39	41.05	22.92	74
13/12/2022	90.18	39.67	7.38	20.04	56.98	40.43	23.47	72
14/12/2022	88.29	37.98	7.56	20.20	56.00	38.98	23.37	72
15/12/2022	87.74	37.23	7.57	19.92	56.71	35.20	23.16	72
16/12/2022	87.88	37.18	7.88	19.30	56.39	38.97	26.02	72
17/12/2022	92.11	38.92	8.46	21.16	56.72	36.96	27.44	74
18/12/2022	99.91	40.41	9.29	22.69	58.86	42.30	25.69	72
19/12/2022	100.25	42.11	10.30	24.14	60.67	30.62	25.07	70
20/12/2022	98.72	41.81	9.39	22.37	50.47	31.41	25.09	60
21/12/2022	89.44	39.34	8.98	21.37	44.07	28.45	27.69	50
22/12/2022	83.47	35.42	9.57	21.09	49.05	31.57	27.69	44
23/12/2022	92.37	35.16	7.36	21.58	53.20	35.56	27.73	49
24/12/2022	89.93	35.56	8.06	21.46	53.31	33.90	27.45	54
25/12/2022	80.81	32.47	7.56	19.61	54.33	36.70	23.85	55
26/12/2022	82.56	33.10	7.72	19.34	54.33	28.46	26.12	66

The asset causing most concern during this period of high demand was our Testwood water supply works in Hampshire. The huge strain on the network due to the freeze-thaw event was compounded by heavy rain (>30mm of rainfall in 12 hours) causing a significant rise in raw water turbidity in the River Test. The turbidity exacerbated difficulties with drawing and treating additional water from the river.

Testwood Water Supply Works has a typical output of 55-58 MI/d during December. However, the turbidity in the raw water restricted the performance of the treatment process, meaning output was reduced by up to 15 MI/d during this incident.



b) A full and candid explanation of your company's response to any impacts, including: communication with customers; mutual aid with other companies; distributions of bottled water; and identification of vulnerable customers and the support provided for them.

1. Planning and preparation

Since the last major freeze thaw event in 2018, we have significantly enhanced our incident management capabilities. Improvements include:

- Establishing a dedicated 12-strong Emergency Planning Team, which continuously reviews, tests, and verifies that all department's emergency plans are up-to-date, robust and fully tested.
- Identifying a large number of pre-scoped bottled water sites in strategic areas to ensure rapid mobilisation when required.
- Creating of an in-house tankering team, consisting of six fully staffed clean water tankers, increasing our incident response resilience and pace.
- Contracting with Water Direct to provide eight tankers available within 4-24 hours.
- Enhancing our internal bottled water stores, which hold between 115,000-190,000 litres of water, supplemented by access to further bottled water stock of 350,000 litres with Water Direct.
- Establishing an enhanced 'Gold' level incident management structure to manage complex or high impact incidents.
- Creating detailed winter thaw preparedness plans.
- Enhancing our operational response by keeping our reservoir levels higher than ~60%. We aim to operate at 75% and 80% across a 24hour control period.

2. Adverse Weather Plan

Since the 2018 freeze thaw event we have created a fully documented Adverse Weather Plan that details how to prepare for a severe weather event. This includes creating a specific incident response team called a Weather Impact Assessment Team.

We have also amended our approach to reservoir storage since 2018, with the aim of achieving 80% storage across the company, a target that is reported and reviewed daily. To support this, we have also increased the volume of operators and network inspectors.

Based on our monitoring, it was clear that freezing weather during December 2022 was becoming more likely. We therefore initiated our winter preparedness and adverse weather plans. An incident for adverse weather preparations was stood up on 14th December 2022, with regular incident calls being held with key stakeholders including representatives from Production and Network Operations, Customer, Communications, Health & Safety, and Operational Control, with actions being completed in preparation for the predicted adverse weather.

Staffing resilience levels were strengthened across frontline operational teams and Operational Control to ensure we had the maximum number of available resources to help us minimise the impact on our customers. A priority response list of our water supply works was reviewed and circulated detailing the order to recover sites in the event of failure. We also pre-emptively identified 21 volunteers to support with distributing bottled water beginning 9am on Friday 16th December, with availability for the whole weekend arranged. This was in addition to our normal rota incident support for roles within our incident management structure.

During this period, we participated in a large number of media interviews and provided statements to local media outlets, both in advance of the freeze thaw event and during incidents which we were responding to, primarily in the areas of Kent and Hampshire. This media work was designed to initially support the education of what might be to come, and then to keep our customers informed about the progress of the incident, the support we were providing via Priority Service Register deliveries and bottled water stations, as well as what to expect as water returned.



3. Incident Technical Network Response

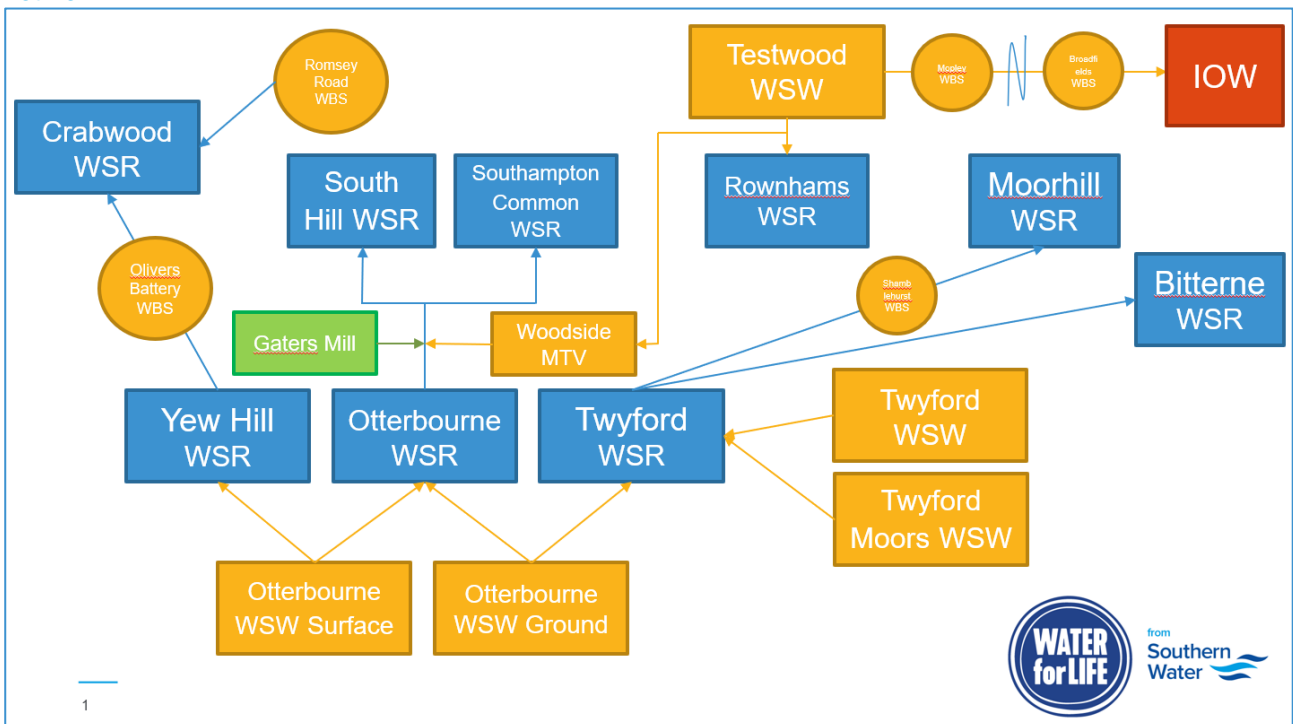
On the 20th December 2022 we became aware of issues at our Testwood and Otterbourne water supply works. This was an issue triggered by heavy rainfall resulting in raw water turbidity across the Otterbourne borehole abstraction and Stream 3 clarification at Testwood Water Supply Works. Overall there was a ~25ML/d impact to supply. This impacted the amount of water we were able to treat and thus how much we were able to provide to our customers.

The incident was quickly escalated to a Red incident on our Incident Management System and, when the full scale of the incident became clear, it was further escalated to a Gold incident (Represents our highest level of management for an event – Usually led by the Chief Operating Office), due to the significant impact to our customers’ supplies. It was also identified that this incident needed a bespoke incident response structure given the complexities of the demand and supply issues, and the risk that these posed to our customers. This allowed us to be more agile to ensure we were monitoring and responding to these risks appropriately.

At the same time, we were monitoring and responding to other emerging risks across our region, including high turbidity at both Timsbury and Horsebridge water supply works, and low water levels in our Broughton Water Service Reservoir.

On 21st December, despite the output from Testwood Water Supply Works increasing to 38 ML/d, we needed to ensure we were protecting supplies, so just before 4am we made the decision to shut Woodside valve to fill up Rownhams Water Service Reservoir; this ensured we protected supplies to 18,328 properties and preserved supply to major hospitals, including Southampton General Hospital. The simplified visual schematic below shows the asset connectivity within this region.

Figure 7: Visual Schematic of the assets within the Otterbourne and Testwood Water Supply Works network



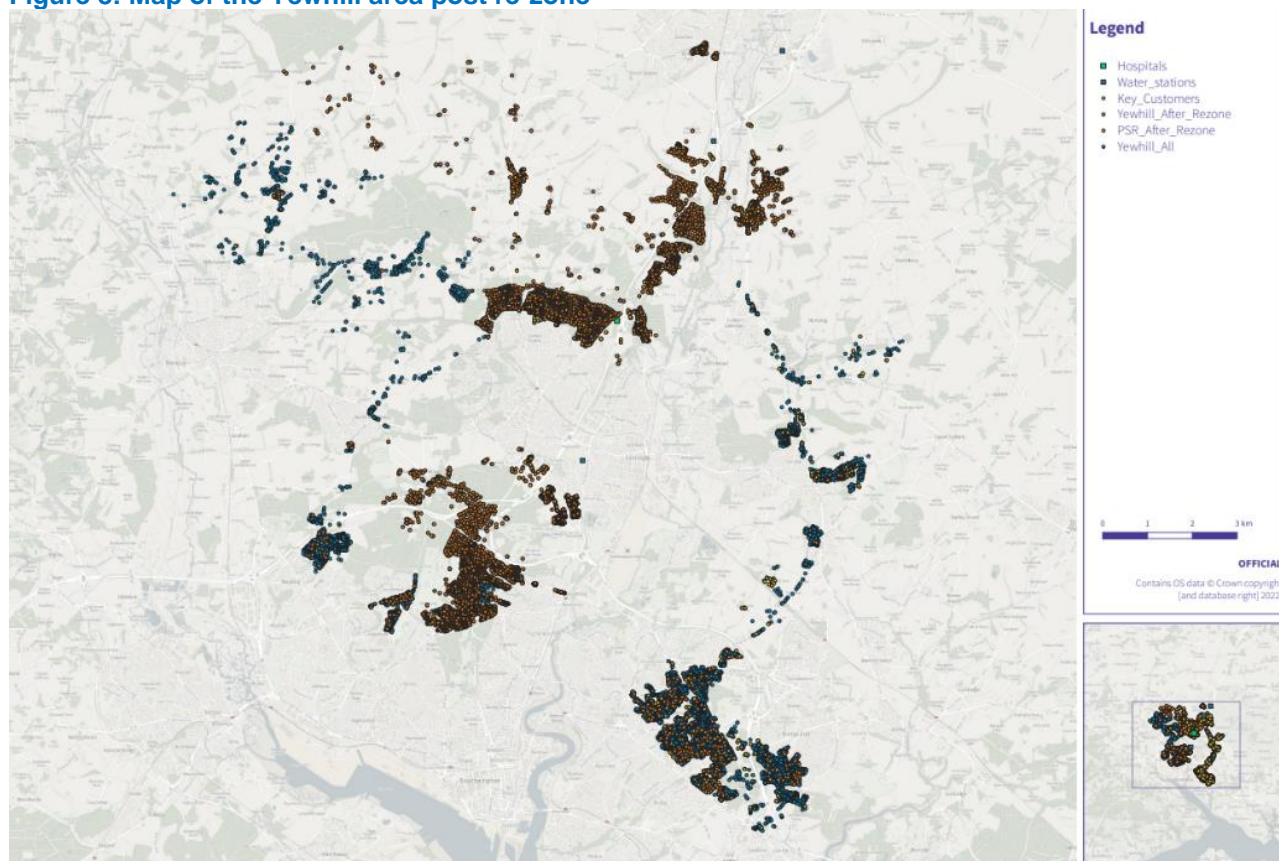
Following the shut in of Yew Hill Water Service Reservoir, we identified that three District Metered Areas (DMAs) serving c.5,087 properties could remain in supply and receive water via Moorhill WSR. Further valve closures were implemented to shut in these DMAs and ensure the plan to protect the part of the supply system containing the hospitals could be implemented fully. The industrial line at Testwood, which feeds the Fawley Esso oil refinery and the Isle of Wight, was stopped to keep Rownhams WSR at a higher storage level.

At around midnight on 22nd December the inlet valve of Lyndhurst Water Service Reservoir was opened allowing the reservoir and downstream Emery Down Water Service Reservoir to recharge, and the Woodside transfer was then re-opened. Works were completed to bring online a temporary pump at Romsey Road Water Booster Station, which allowed supplies to be transferred to Crabwood Water Service Reservoir to keep it in supply.

Portsmouth Water also made available the Gaters Mill transfer on 22nd December. This was unable to be used prior to the 22nd December due to planned capital maintenance, which was not easily reversible. Before being put in to supply the transfer had to be flushed, and two sets of samples taken to ensure wholesome water, with the sampling completing on 22nd and 23rd December.

Just after 4.30pm on 24th December the outlet valve on one cell of Yew Hill Water Service Reservoir was opened, and the network was then being supplied as normal by the reservoir. All areas of the supply system subsequently returned to normal supply by 25th December 2022.

Figure 8: Map of the Yewhill area post re-zone



4. Vulnerable customer support

We encourage our eligible customers to register on our Priority Services Register (PSR), and we proactively gather this information so that it can be used during an incident to support our customers with alternative supplies of water, particularly if they are unable to travel to our bottled water stations.

Our PSR reach has increased significantly in advance of this incident, providing much greater protection to our vulnerable customers. At the start of AMP7, 1% of our customers were on our PSR; this has now increased to 7.4% as of the end of January 2023.

During incidents we also liaise with our Local Resilience Forums (LRFs) to get information from them about priority vulnerable customers. Our PSR database will then be enhanced with the LRF lists to give us a more complete view of key customers for direct doorstep deliveries. Ideally, we would prefer to have this information in advance of any potential incidents, however there are concerns from the LRFs on data protection and security. We are continuing to collaborate with our LRFs with the aim of agreeing a suitable way to improve this process, which will enable a more efficient response for our PSR customers during incidents.

Any customers that find themselves struggling to get to bottled water stations are also encouraged to reach out to get priority deliveries throughout our incidents. This means our priority lists consist of pre-registered customers, information from the LRFs and customers who call in requiring support during the incident.

We had pre-identified 4,163 Priority Service Registered customers impacted by the South Hampshire incident. A re-zone of the network was completed as part of the Network Emergency Response Plan, which reduced the impacted number of PSR customers known to us to 1,141.

During the incident we communicated with the LRF to ensure that we had accurate data relating to vulnerable customers, some of whom may not have self-identified themselves to us. Following these conversations, 167 additional customers were identified to us by Hampshire County Council (other customers provided to us were already on our PSR). A further 58 vulnerable customers were identified to us through conversations with Southampton City Council.

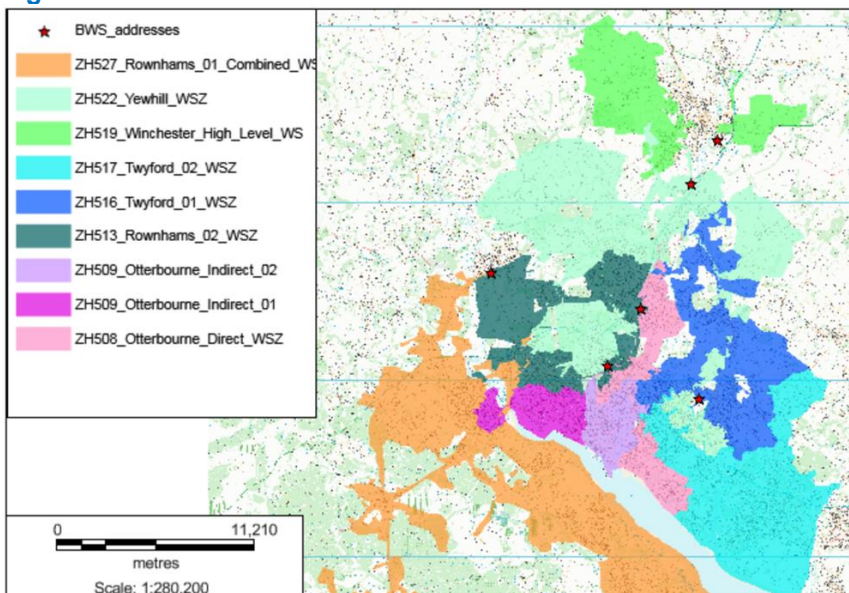
In total, we arranged for water deliveries to 1,783 customers, which included 417 vulnerable customers who identified themselves to us directly during the incident in Hampshire. We also delivered bottled water to 19 care homes (totalling over 450 pallets), six farms and one hotel.

Deliveries occurred at multiple points throughout the incident to ensure we were meeting our customers' requirements.

5. Bottled water stations

An alternative water response was initiated throughout the 21st December which included three bottled water stations stood up by 3pm with siting based on proximity to the affected areas, customer density and logistics (e.g. access for deliveries). An additional three bottled water stations were stood up on 22nd December, bringing the total number of bottled water stations to six, the locations of which can be seen in Figure 9 below.

Figure 9: Locations of bottled water stations



Lessons learned from previous freeze thaw events enabled us to have a greater availability of bottled water which we could deploy in a more timely manner. As part of our emergency planning, four of the bottled water stations stood up in this event had been scoped by our partners MTS Cleansing prior to this incident. These were:

- East Winchester Park and Ride
- South Winchester Park and Ride
- Places Leisure
- Romsey Rapids

In addition to the pre-scoped bottled water station locations, we worked with the LRFs to seek guidance and support as to where additional bottled water stations should be located. The two locations set up in collaboration with the LRFs were:

- Ageas bowl
- Cantell School

Also building on lessons learned from past events, we now have a bottled water tracking system which is updated monthly, showing an accurate record of how much water we have within our stocks, where it is stored and the expiry date.

In total throughout this event, we provided c.1.3m litres of water in bottles, which was a combination of water held by Water Direct on our behalf, and water held in our internal stores. At no point throughout this incident did we run out of bottled water stocks.

6. Customer communications

In advance of the freezing temperatures our contact centre was briefed, and our contact centre contingency plans enacted. This included additional resources to answer customer calls, social media messages and requests, to help ensure we were correctly triaging customer calls relating to leaks and bursts.

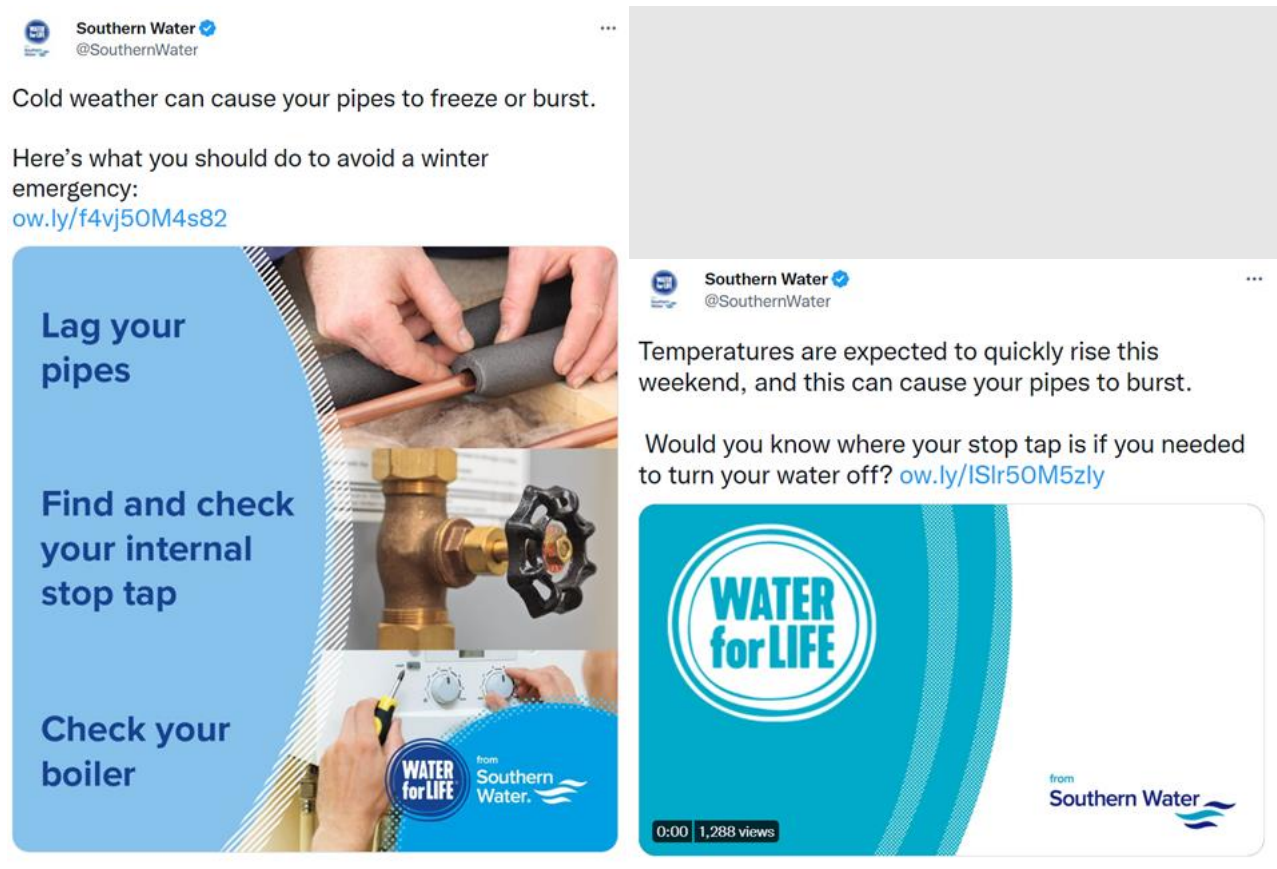
Proactive communication was shared on our website, as well as via social media, as we were trying to prepare our customers and forewarn them of what was expected, helping them to safeguard and protect any exposed pipes or outdoor taps. Messages online were shared on the 16th December and advised customers what action we were taking and steps they could take. [Southern Water Gears Up In Case the Big Thaw Turns in to Big Bursts - Southern Water: Water for life, Water and wastewater services for Kent, Sussex, Hampshire and the Isle of Wight](#)

Social media messaging covered guidance and advice for customers, including lagging pipes, checking internal stop taps and checking boilers. We shared videos demonstrating how to locate stop taps, and provided links to order pipe protecting packs. Proactive messaging began on the 14th December 2022.

Throughout this incident, we kept our social media channels regularly updated, showed the latest incident status on our online incident map, and provided updates to local radio and television. We also provided regular text messages to 11,000 customers each time there was an update.



Figure 10: Examples of social media customer communications



Social media messages varied from guidance on safeguarding against freeze thaw incidents to updates relating to those customers who had their supply disrupted. As the incidents were declared we immediately established a live area within our news site where we could place new updates on how the fix was progressing, provide information on how to register for PSR deliveries and access help, as well as provide locations and opening times for our bottled water stations.

As water came back into supply our messaging changed to remind customers not to leave taps switched on if they were either leaving the house or going to bed to avoid flooding, as well as what to expect in terms of pressure issues or bubbles in their water. Social media posts were used consistently to highlight new messages, signposting customers back to the website; text messages similarly pointed customers to our website for the more detailed information that they needed.

Subsequent independent research has shown that 78% of customers impacted by the South Hampshire incident received their updates via Southern Water channels. This demonstrates the learning and more structured approach we have adopted since the Isle of Sheppey incident in July 2022 is making a tangible, positive difference. For the Isle of Sheppey incident just 21% of customers said they received their updates from Southern Water when the same question was asked. The use of text messaging to keep customers updated was a key lesson learned from the Isle Sheppey incident, where text messaging was not used.



7. Tankering

On the 16th December, Water Direct was asked to relocate eight of its water tankers into the Southern Water area, to be held on standby at one of their nearest depots. We also stood up our internal tankering team, which in December consisted of five tankers operating 24 hours a day.

Tankering plans for key customer sites such as hospitals and prisons were activated to ensure these sites did not run out of water. Due to the success of our rezoning efforts, only one hospital (Nuffield Health Hospital) was within the final impacted area.

8. Mutual Aid

Mutual Aid was requested on 21st December at 5.27pm, following the procedures set out in the Water UK Mutual Aid Manual. However, most of the replies received were negative, or not suitable as other water companies were facing the same challenges. Portsmouth Water provided a bulk supply via the Gaters Mill transfer, though this took longer than desired due to an ongoing capital maintenance scheme; SES Water also offered two 11k tankers, however they had no available drivers.

One of the key lessons to be learned from this incident is to understand how national events impact our ability to call upon Mutual Aid. We have also identified ways to improve our staffing of large-scale incidents, with work being completed on rostering systems, both internally and externally.

c) Arrangements for compensation to impacted customers

The compensation household and non-household customers receive in respect of water supply interruptions is based on our Guaranteed Standards Scheme (GSS). This is set at £30 for every 12-hour period customers' water supply has been disrupted for households and £75 for non-households.

Proactive identification of customers impacted is determined by pressure readings from critical control points and manual checks undertaken off high / low points in the network. This analysis also enables us to determine the length of time customers are out of supply. It is carried out by our specialist water network control team using pressure and flow systems, pressure management equipment and data logging.

GSS payments were made to 8,797 household customers and 1,823 non-household customers well within the 20 days deadline, being paid on 18th January. We sent letters to household customers with information on their payment. For non-household customers, we informed their retailer of the GSS payment amount so they can credit the customers' account and advise accordingly.

d) Lessons learned from this experience and changes you intend to implement; and whether lessons learned from the 2018 freeze-thaw and recommendations from Ofwat's Out In The Cold review have been implemented.

1. Our response to 2018 freeze thaw event

In response to the previous freeze thaw event in 2018, we identified a significant number of improvement actions. These improvement actions formed part of our action plan to address the issues identified in Ofwat's letter of 19th June 2018, following its 'Out in the Cold' review.

Table 4 below shows the challenges that were identified in our action plan, and the actions we committed we would implement. Completion of these actions was independently assured by PwC with oversight from our Board's Audit Committee. Assurance evidence can be provided to Ofwat if required.

Table 6: Challenges, actions and assurance

Workstream	Business Challenge identified	Action Plan	Completed	Assurance/Next steps
Planning and Preparation	Failed to anticipate the scale of the impact	Deliver Improved forecasting and early warning capability	Yes	External assurance completed in September 2019 by PwC
		Improve performance of network monitoring assets	Yes	External assurance completed in September 2019 by PwC



	No contingencies for planning maintenance outage	Revise and ratify Safe Control Operations (SCO) process	Yes	External assurance completed in September 2019 by PWC
	Delay in restoring supplies following power outages and asset unavailability	Rollout Operational Excellence hubs in all three regions	Yes	External assurance completed in September 2019 by PWC
		Deliver brownout mitigation measures	Yes	External assurance completed in September 2019 by PWC
		Deliver outage management plans	Yes	External assurance completed in September 2019 by PWC
	Limited interconnectivity between supply systems	Deliver connectivity schemes and agree contingency connections with other companies	Yes	External assurance completed in September 2019 by PWC
	Incident management framework not rolled out	Develop and rollout Operations incident management framework	Yes	External assurance completed in September 2019 by PWC
Incident Response	Response was reactive and fell short	Embed Operations incident management framework, and update contingency plans	Yes	External assurance completed in September 2019 by PWC
	Inadequate alternative supplies for logistics	Define strategy, increase alternative supply assets, and water bottles, tender & award contract	Yes	External assurance completed in September 2019 by PWC
Customer comms	Reactive domestic and business customer comms	Improve proactive and incident communications content, process, systems and competence	Yes	External assurance completed in September 2019 by PWC
	Customers calls went unanswered	Improve customer contact data, process & competence. Increase contact centre capacity	Yes	External assurance completed in September 2019 by PWC
Stakeholder Comms	Communication with LRF's was patch and reactive	Proactive collaboration with LRF's including co-creation of response plans	Yes	External assurance completed in September 2019 by PWC
		Deliver coordination training to Incident Managers and Resilience Advisors	Yes	External assurance completed in September 2019 by PWC
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	Yes	Internally assured in October 2019
		Deliver 'Support and Reach' programme for a more accessible and aligned service	Yes	Internally assured in October 2019
Compensation	Uncertainty of eligible customers, slow process	Improve identification of eligible customers and efficiency of payments (details awaited)	Yes	External assurance completed in September 2019 by PWC
Other initiatives	Operational Resilience	Complete Zonal Resilience assessment (Water)	Yes	External assurance completed in September 2019 by PWC
	Organisational Resilience	Rollout business-wide Security and Incident Mgt Framework (H&S, IT Business Continuity)	Partially	We have introduced an IT incident management framework, but further work required to scale across other functions

In addition to these high priority actions identified in our action plan, we also identified a significant number of supplementary actions that were implemented to improve our incident response. These included enhancements to our out-of-hours incident rotas, additional training for specific roles and activities, and increasing internal bottled water stocks at key locations.

2. Our learning from this event

In line with our normal practice to ensure continuous improvement in our management of incidents, we completed a number of debriefs following this event, separated into four workstreams, either in person or by questionnaire. Each debrief identified recommendations, areas for improvement, and areas of good practice.



All the recommendations, action owners, and dates for completion from the debrief sessions have been collated. Copies of the full debrief reports can be provided if required.

The debriefs showed that we had made some good progress in planning and responding to freeze thaw events, however, a number of strategic actions drawn from our incident review were identified. These covered:

- Preparation for the event
- Central control for South Hampshire
- Improvements in PSR and bottled water management
- Better end-to-end work management systems
- Resilience of our surface water treatment works

(a) Preparation for the event

In terms of preparation, the first lesson was that an incident should have been recorded within our incident management system earlier. Our freeze thaw response was initially co-ordinated as an event managed within our Operations directorate, without the involvement of the wider business and incident strands. When the event was raised to incident level under the Water Operations Director, other internal stakeholders were included which assisted in planning to respond and deal with the predicted weather.

Furthermore, we did not communicate sufficiently with the Local Resilience Forums prior to any incident occurring. We have received feedback on this point and will ensure better communication ahead of any foreseeable incident occurring.

(b) Central Control for South Hampshire:

We are in the process of building a plan to migrate the control elements of the Southern Hampshire Water Networks and Reservoirs to our Operational Control Centre in Durrington. Currently this area is being managed locally by Testwood Water Supply Works' controllers, with second shift patterns (implemented in 2022) in place to provide additional resilience. However, they are also responsible for the ongoing day-to-day operation of the site and elements of the control processes are closely linked to central processes. Therefore, we have identified the opportunity to improve the resilience of the control of this region and synchronise the detection, monitoring, control, and escalation of this area with our central business processes.

(c) Improvements in our PSR and bottled water management

Following the recent freeze thaw event, we have implemented dynamic teams that are working on identifying and implementing incremental improvements to our PSR deliveries and bottled water distribution sites management. These include a range of short-term improvements such as automating volunteer requests into bottled water site rotas, reviewing all rotas and increasing capacity within these, and improving the initial physical set-up of sites.

(d) End-to-end work management programme

With the support of external specialists in work management, we have commenced a transformational programme to enhance our end-to-end work management processes and procedures. This programme is designed to improve our field operations productivity, jeopardy management, and customer experience.

(e) Resilience of our surface water treatment works

It is clear that the resilience of our surface water treatment works is not currently sufficient, increasing the risks faced by customers served by these sites. Following detailed root cause analysis we have compiled comprehensive site strategies for our four critical surface water sites. These four sites include Testwood and Otterbourne, which were involved in the South Hampshire incident, along with Hardham in West Sussex and Burham in Kent. These site strategies have identified the process, power and control improvements required to improve the performance and resilience of these assets to help prevent future incidents from occurring.

For Testwood and Otterbourne significant investment of c.£500m is required to address around 180 identified needs. This activity and investment is vital to ensuring resilience supplies for our customers in South Hampshire in the long term as there is currently no headroom in our system to account for significant changes in supply or demand. This investment has commenced in AMP7 and will continue through AMP8 and will be part of our PR24 business plan.

