A. Factual details of freeze/thaw events

Question A1: Provide details of the impacts of events on your network / customers using the attached tables (please complete both sheets). We are requesting information from the period 14 February 2018 to 14 March 2018. Please specify on which dates your company considered it was managing events rather than business as usual (the end date should be no earlier than all customers being back on supply). If you consider it appropriate, you may extend the date range (eg to the start of February) and explain why additional dates are relevant. You may not reduce the date range.

1. We have attached completed versions of Tables 1 and 2 covering the period 16 February 2018 to 14 March 2018 which are the dates specified in the Ofwat data tables. We were managing multiple freeze/thaw incidents rather than business as usual over the period 4th to 9th March 2018, although there were a number of customers in rural Derbyshire who experienced intermittent supplies beyond this period. As a result of prolonged and freezing weather, we triggered a 'Bronze' level operational response on 1st March which was escalated to Strategic level on the 4th March until 9th March. Section B explains our incident management structure and approach.

Question A2: Beyond the issues highlighted in Tables 1 and 2, please provide details of any further impacts your network or customers (by customer type) experienced that your company had to respond to?

2. Some customers in rural areas faced intermittency after water supplies to their area had been restored, as a result of airlocks that had developed during the interruption. We have captured these customer impacts by including them within the interruption numbers provided in Table 1. The implications that airlocks had for our incident response work are considered further in our response to the questions in Section C.

3. There was a further, localised freeze/thaw incident on the 7th March in parts of rural Derbyshire. This resulted in additional network and customer pipe bursts. Also, some areas experienced heavy snowfall (including snowdrifts) in the days that followed the 4th March thaw. This hindered our efforts to locate and address problems.

Question A3: Details of how responding to the incident impacted on your wider business's "business as usual" operations during the incident period. Where possible provide an indication of the scale and nature of these impacts.

4. The redeployment of resources in order to increase response capability is an integral part of our strategic incident management plan. This can inevitably mean that incident responses result in other work being rescheduled. This included planned maintenance work (e.g. reservoir inspections) and other non-essential activity.

5. Our incident response had other consequences for other parts of our service provision for customers, including:
   - Billing activities: diversion of staff away from our annual 'main billing' period resulted in some deterioration of service levels in our inbound customer contact centres related to billing enquiries.
   - Credit collection: we ceased outbound calls to customers related to credit collection for one week.
   - New development services: the redeployment of staff away from work that connects new developments to our network may have resulted in delays to project timelines.

Question A4: What have you judged to be the cause of the issues, particularly water supply interruptions, for your customers (by customer type) during this period? What factors were relevant?

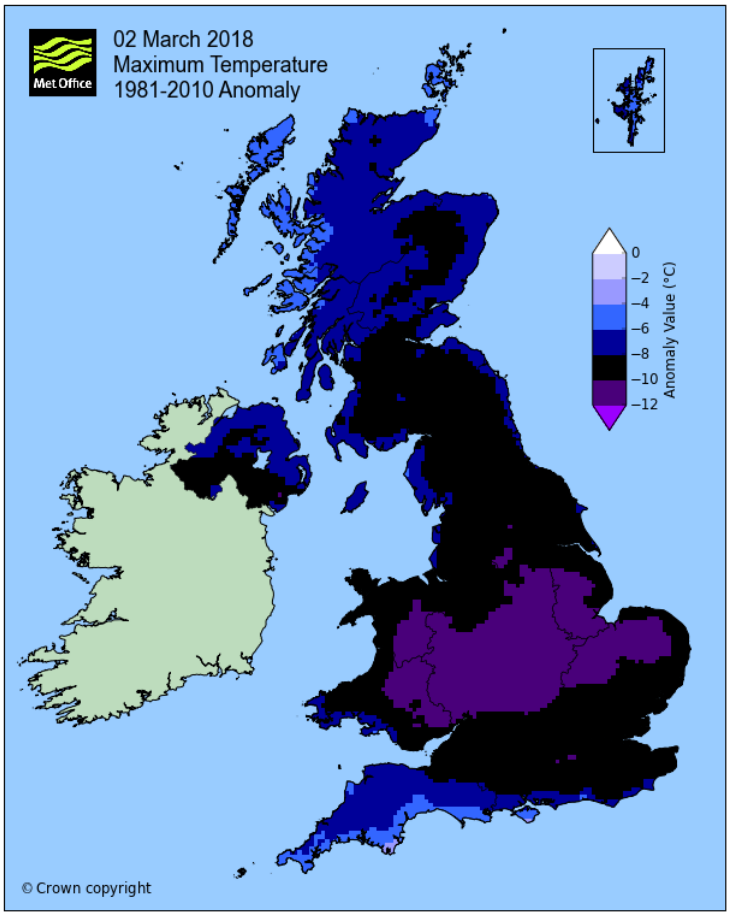
6. We recognise and apologise for the extent of disruption and inconvenience that the loss of supply causes for our customers, and have sought to thoroughly and rapidly investigate and understand the factors that resulted in the interruptions that were faced. The following sets out our assessment of the cause of the issues that arose for our customers.

The weather conditions that were faced in our region over the period.

7. The underlying driver of the interruptions that our customers faced was an extreme weather event. The combined effect of Storm Emma and the 'Beast from the East' meant that weather conditions across the UK were severe from 23rd February to 5th March. There were three key aspects to this within our region:

   a. **Freezing conditions for a prolonged period**: We experienced a multi-day period of freezing weather across our region, with eleven consecutive days when the minimum temperature was below freezing. These temperatures were around 10°C lower than the average for that time of year (based on data for the past 30 years). This is illustrated in Figure A1 below.

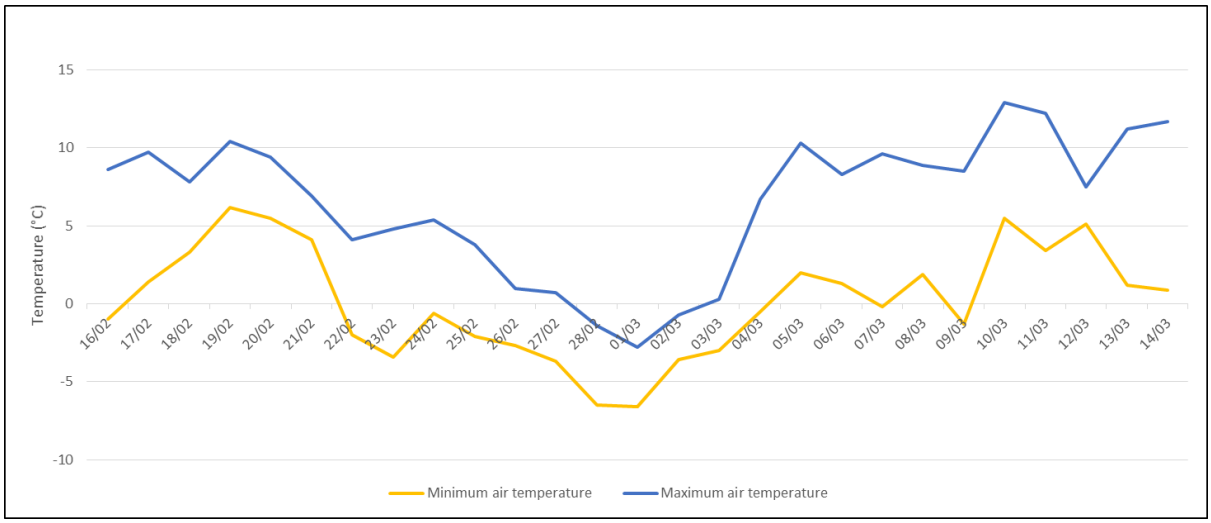
Figure A1: Maximum temperatures compared to long term average



Source: Met Office, https://www.metoffice.gov.uk/climate/uk/interesting/february2018-snow

b. **The speed and extent that the temperature increased from freezing:** As shown in Figure A2, the maximum temperature across our region increased by 10 degrees from freezing on the two days following March 3rd. While we had been expecting a thaw event, the scale of this change was much greater than had been forecast in the preceding days, whilst not dissimilar to that experienced in 2010.

Figure A2: Maximum and minimum air temperatures

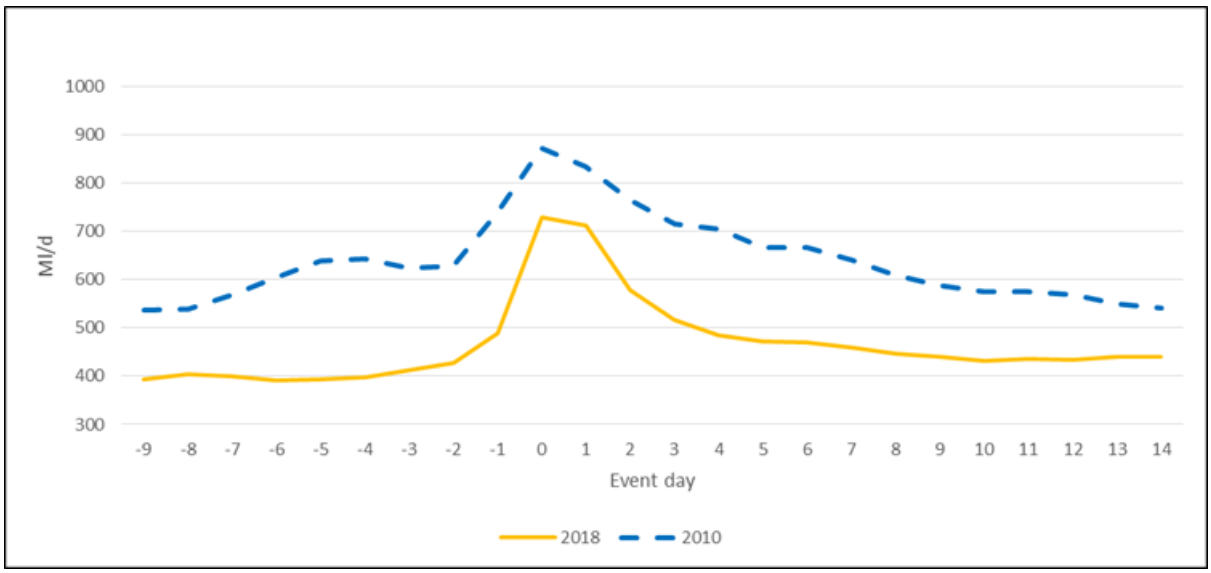


c. **Repeated poor weather in some rural areas:** some parts of our region experienced repeated poor weather that affected the time it took to resolve some of the supply problems our customers faced. In particular, rural areas in Derbyshire experienced heavy snowfall (including snowdrifts) in the days that followed the 4th March thaw. Some photographs illustrating the extent of the snow on the ground in rural areas are provided in Appendix L1.

The impacts that the weather conditions had on our network

8. In the two days leading up to the thaw, a considerable number of pipe bursts occurred, resulting in a significant increase in demand on our network because of an approximate 70% (300 Ml/d) increase in losses of water (leakage). This was a more rapid increase than we experienced in the 2010 freeze-thaw incident, when leakage increased by approximately 40% over a similar two day period in terms of temperature increase.

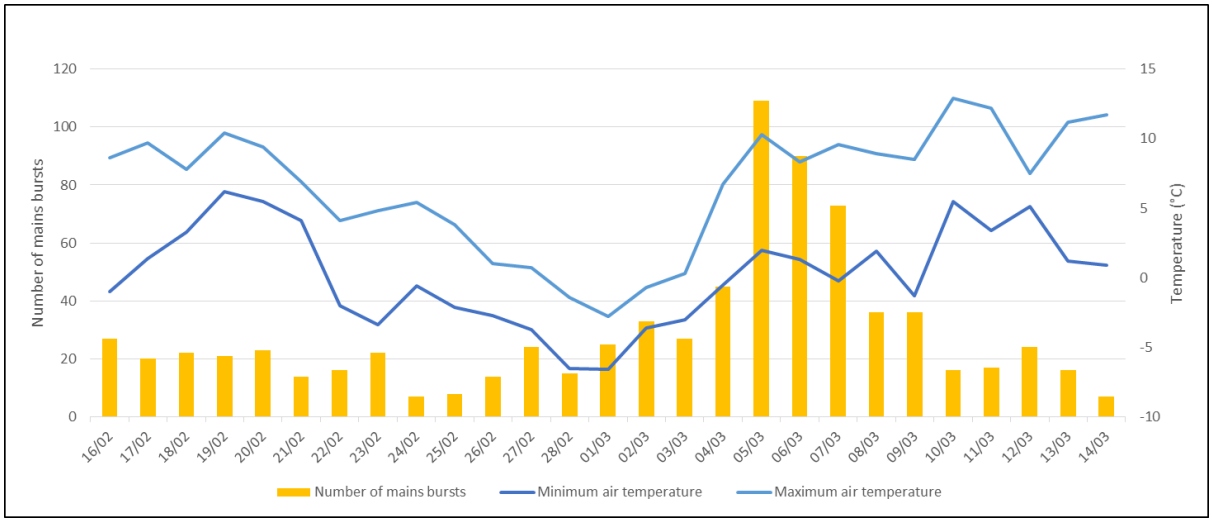
Figure A3: Freeze thaw comparison leakage (2010 and 2018)



9. These changes in leakage levels are shown in Figure A3 above. As can be seen, our typical leakage levels are substantially lower now than they were in 2010, but the scale of the leakage increase experienced in the rapid thaw period (days -2 to 0 in the above graph) was significantly greater in March 2018 than it was in December 2010.

10. We have reduced the number of burst mains on our network over the last 8 years, which has resulted in lower leakage levels. As can be seen in Figure A4, the rapid thaw resulted in a significant number of pipe bursts on our network. Our analysis shows that these bursts accounted for around 30% of the overall increase in leakage that occurred.

Figure A4: Number of mains bursts



11. However, we estimate that 70% of the increase in leakage resulted from bursts to customer pipes. We are as yet unclear why the weather conditions resulted in such a high level of customer pipe bursts, and – as set out in Section F below – intend to ensure this issue is thoroughly investigated, and an appropriate response identified and implemented.

12. Our Strategic incident status was triggered on March 4th, and we implemented a series of operational responses rapidly to try to ensure that customer supplies remained uninterrupted. This included increasing the amount of water into supply by 22% to 2,200 Ml/d, and mobilising additional field staff to find and fix leaks. As a result of our response, 98% of our customers remained on supply.

13. However, we experienced localised issues where a combination of factors meant that we were unable to maintain piped supplies to all of our customers. The combination of circumstances in each area was different which meant that we were, in effect, concurrently handling several separate incidents. These incidents were in the following four geographic areas:
    - South West Birmingham (Northfield)
    - Rural Derbyshire
    - Rugby, Warwickshire
    - Rural Leicestershire

South West Birmingham (Northfield)

14. In the South-West part of the Birmingham area, the thaw resulted in a number of bursts across the distribution system within the city, known as the Northfield system. This increased the level of leakage on the Northfield system by 120%, causing a rapid decline in water levels in the reservoir. Severn Trent teams were deployed to find and fix bursts in the area, subsequently repairing 23 burst mains and 14 communication pipe leaks across the entire area, eliminating 30% of the total water demand increase. The remainder of the increase in demand was driven by pipe bursts within the boundaries of customer properties. The increase in demand resulted in some intermittency in the operation of pumps that feed the Northfield reservoir, and this exacerbated the supply challenge.

Rural Derbyshire

15. The water distribution network in rural Derbyshire is extensive and complex, due to the geography and topography of the area (especially in and around the Peak District), and the relatively low population density and disparate spread of rural communities. During the initial thaw event a 75% - 100% increase in loss of water (leakage) was experienced in various parts of rural Derbyshire. Despite deploying additional front line field engineers to the affected areas, only a limited number of bursts were found on our network, confirming the extent to which the increase in losses of water was driven by customer pipe bursts. Our ability to respond to the significant increase in demand was diminished because of burst to a 12in main on the inlet to Breamfield reservoir on the morning of Monday 5th March. Breamfield is a reservoir in Derbyshire that feeds a network of 11 additional small reservoirs in a very rural area. The level dropped significantly within a short period of time and consequently a number of the smaller reservoirs that feed off the Breamfield system ran empty. Supply was restored within six hours through the alternative feed into the reservoir, and the main was repaired within 21 hours, despite extremely challenging weather conditions. All reservoirs in the area were being supplied by the evening of the 6th March, with the exception of Uppermoor which was supplied 1 day later.

16. There was a further secondary front of localised extreme weather event on the 7th March, which resulted in further network and customer pipe bursts, and subsequently a further significant increase in demand on the system. Extensive tankering helped ensure that all reservoir levels were maintained in a healthy position, despite the further extreme weather period. Unfortunately, some customers in rural communities in the area did experience prolonged periods of intermittent supplies. A combination of the geography of the area, land topography and continuing bad weather, including significant residual and fresh snow fall, hampered efforts to remove air locks from the water distribution network and full restoration of flows to customers. Alternative supplies were made available to customers through bottled water provision as detailed further in section C.

Rugby, Warwickshire

17. The thaw event resulted in an increase in water losses (leakage) of 125% across the Rugby area in Warwickshire as a result of pipe bursts. Additional field engineers were deployed, quickly identifying and repairing 14 pipe bursts across the network. This accounted for around 40% of the increased water demand, with the remainder being driven by customer pipe bursts. The network repairs and supplementary tankering of treated water into the area ensured supply was quickly restored to all customers. A bottled water station was established but not utilised due to the speed with which supplies were restored. Demand continued to drop as customers repaired bursts on their pipes.

Rural Leicestershire

18. The freeze/thaw incident resulted in in 100% increase in water losses (leakage) in parts of rural Leicestershire as a result of pipe bursts. Additional field engineers were deployed to the area, locating and repairing 15 pipe mains bursts and 3 communication pipe bursts, with this addressing about a third of the burst-driven increase in demand. An extensive tankering operation was established for the area, however there were continuing intermittent supply issues until demand reduced (as network and customer pipe bursts were repaired). Bottled water was made available to affected customers, with deliveries made directly to vulnerable customers.

The causes of the supply problems

19. As was highlighted above, the underlying driver of the interruptions our customers faced was an extreme weather event. The scale and pace of the temperature increase from freezing from March 3rd resulted in a considerable number of pipe bursts, with this causing a significant increase in demand on our network as a result of a c70% increase in losses of water (leakage). Around 30% of this increase in losses was attributable to bursts in our network, with 70% attributable to customer pipe bursts.

20. For 98% of our customers, supply was unaffected despite the extent of the increase in demand as result of pipe bursts. However, as highlighted in the above descriptions, customers in these four areas did experience supply interruptions because of the combination of two or more of the following factors:

    a. **The acuteness of the supply losses resulting from pipe bursts**: all four of the areas experienced around a 100% increase in leakage during the incident. For all areas, a high proportion (c70% or more) of this increase in leakage was attributable to customer pipe bursts.
    b. **Network bursts or other operational problems**: A burst on an inlet pipe to a reservoir in rural Derbyshire, and pump failure in Birmingham, exacerbated the supply challenge we faced as a result of the substantial increase in demand resulting from pipe bursts.
    c. **The weather conditions that followed the thaw**: in rural Derbyshire there was a second freeze/thaw incident which exacerbated the extent of leakage as result of pipe bursts, and snow levels hindered our repair and supply restoration activities.

B. Planning and preparation

Ofwat: We want to understand what steps companies took prior to the incident period to prepare in order to minimise the impact on customers.

Question B1: How did your established processes for gathering intelligence and insight into the potential effects of forecast bad weather on your network help you to prepare for this event? Did they highlight any particular risks and what did you do to mitigate these? (eg network preparation, communications with customers, increased engineering or call centre resources) Did you share insights with other utilities/services?

21. We have seasonal preparation plans to cope with adverse weather conditions, such as snow in winter and hot weather in summer. Our winter preparedness plans were reviewed, updated and approved in November 2017 by a member of the Executive Committee.

22. Our principal source of intelligence gathering concerning weather-related risks comes from Weatherquest, a company that provides detailed forecasting services for clients in many sectors.

23. Weatherquest provide us with a tailored daily report which identifies any Met Office weather warnings that are in place which affect our supply area, provides a weather synopsis for the UK, and provides short-term (today, tonight, tomorrow) and medium term regional (and to some extent sub-regional) forecasts. These forecasts inform our 'business as usual' operational decision making, but also feed into our overarching incident management procedures.

24. Our incident management procedures are designed to establish an escalation and response framework that provides an effective means of managing the broad range of risks that can affect our ability to deliver for customers. This is set out in further detail in Section B2.

25. We were monitoring the weather forecasts and preparing in accordance with our incident management plans from the 23rd February. We moved to formal Operational Bronze on the 1st March.

26. We anticipated and planned for a thaw as part of our Operational Bronze incident team, as detailed below. However, the Weatherquest reports that we received were not forecasting a rapid temperature increase. As can be seen in Table B1 below, the Weatherquest report for Friday 2nd March was forecasting that it would gradually turn warmer through Sunday 4th March and the early part of the week beginning Monday 5th March. In actuality, the maximum temperature increased by around 10°C over the period between the 4th and 5th of March. This increase in temperature, which was faster than expected, triggered the pipe bursts that occurred.

Table B1: Weatherquest forecasts

Day of forecast	On the Day of Forecast	Next Day	Medium Term
Thu 1 March	Max -2°C	Max -1°C	"Forecast uncertainty remains high into the weekend" "low-end risk for another widespread round of snow on Saturday afternoon…"
Fri 2 Mar	Max Day -1°C in North, colder elsewhere Min Overnight -5°C	Max 1-2°C	"Gradually turning warmer through Sunday and into the early part of next week…still the risk of some overnight frosts"

27. Weatherquest did not provide a report on Saturday 3rd March due to issues of their own.

28. Our normal winter preparedness and Operational Bronze planning had put in place a number of actions to prepare for the thaw, in line with the forecast, including:

    - Our leakage levels were tracking ahead of target in the lead up to the incident.
    - Stopping / postponing some non-essential maintenance work on the weekend 3-4 March 2018 to minimise the disruption to our network.
    - We shut off planned work on the Elan Valley Aqueduct.
    - We postponed 13 pre-planned reservoir cleans over the period.
    - We reduced our work in progress queues to ensure a fast response to any additional workload and customer facing issues.

29. Further to the measure above, additional people were scheduled into the resource plans for Network Control and the Customer Contact Centres through the expected period of the adverse weather. Field staff were also contacted by their management teams to ensure that they could be mobilised if needed. Further detail is set out in Section C2.

30. Our primary approach to people readiness is to have it engrained as a core feature of our organisation, and its culture, and to have multi-skilled staff that can be re-deployed across the business to enable a flexible response to events. This is consistently supported and promoted by our Executive Committee, and forms a key part of incident response capabilities.

31. A mandatory conference call is held at 10:00 am every Monday and Friday for all those on standby in roles linked to an operational incident. This procedure is well established. It follows a set agenda that covers operational issues, planned work and any forecast issues. They ensure all those on duty are aware of any ongoing or forecast issues so they can plan and prepare accordingly.

32. We have also built up resources that deliver alternative or continuous supplies during incidents. This comprises 33 tankers, pallets of bottled water at our local stores and 300,000 litres of water per day available through our contract with Water Direct. On the 2nd March, 14 tankers across

3 locations were moved indoors to provide protection against freezing and guarantee their availability. Trace heating on vehicles was checked in advance for all other tankers.

33. Details of our approach to communication before, during and after the incident are detailed in Section D below.

34. Through following our pre-established, reviewed and tested risk management procedures, we sought to take a set of prudent steps to strengthen our resilience and response capability in light of the weather conditions that were being faced, and the forecast intelligence we had at that time.

35. We did not share our plans or approach with other utilities prior to the incident as we were following our established procedures. We were also not approached by any other water company enquiring about our or their plans. However, we attended a DEFRA led call with the other water companies on the morning of Monday 5th March which looked at the issues being faced by the sector overall. One of the key issues discussed at that meeting was the availability of bottled water, as there were only two suppliers across the industry. However during this incident this was not a problem.

Question B2: What impact, if any, did your preparation have on your ability to handle this event? What role did your Executive take in preparing for these severe events?

36. The core preparations that underpinned our ability to handle this incident are the extensive development, ongoing review and testing of our incident management plans, processes and procedures. This defines a range of risk-based triggers, and a set of escalation, operational and governance procedures to be applied when those triggers are hit. Our incident plans for severe weather events form part of this broader framework. See the table below which sets out our incident management structure.

Table B2: Severn Trent Incident Management Structure

Severn Trent Escalation Level	Description	Incident Management Lead
Strategic	A significant company level incident that requires a dedicated incident management team operating at the highest level	Executive Team Member
Tactical	Incidents that require a company level response with coordination of resources from more than one department/directorate	Strategic Leader
Operational Silver	A departmental incident that has escalated to require a higher degree of incident management structure	Business Leader
Operational Bronze	A departmental incident that has reached the lowest incident trigger level but which requires a degree of formal incident management	Team Leader Team Manager

37. Our Strategic Incident Management Response Plan (SIMRP) is our overarching document that sets out the strategic level incident management framework, objectives, roles and responsibilities of all the relevant parties involved, including engagement with external stakeholders. A copy is attached in Appendix B1. This is a living document that's been validated during major exercises. The first test of the document in its current form was in 2016 in Exercise White Lightning. This was a 2 day live-play water supply interruption exercise over the 10th and 11th February of that year. As well as testing the plan at Operational, Tactical and Strategic levels, the entire Executive Committee were trained and assessed in Strategic Incident Management by our external training provider. The plan was tested in a similar 1 day exercise (Exercise Lionheart) on the 22nd March 2017 and in our first strategic cyber exercise (Exercise Harpoon) on the 11th September 2017. The plan works well, provides the right structures and governance for overall management and is familiar to and understood by the Executive and the wider Strategic Leadership team members. It is regularly reviewed and was last updated and approved by our Executive Committee in February 2018.

38. The SIMRP is supported by other standards relating to Strategic Incident Room Management, engagement with Local Resilience Forums (LRFs) and by a series of workstream plans developed during a detailed review in 2017.

39. Sitting beneath this framework are several detailed incident management plans for various scenarios. Our "Wholesale Incident Management Pack (2018)" is a comprehensive 110 page document that covers many scenarios, including severe weather. We have five individual triggers within this document relating specifically to severe weather, including duration of freezing conditions. However we don't have a clear trigger related to the predicted speed and extent of a thaw. This may be an area we look to investigate with the Met Office and Weatherquest and any other appropriate agencies who specialise in this area to further refine our incident management plans and in particular whether it is possible to predict the speed and extent of any thaw.

40. A great deal of work has been undertaken to support the quality and detail of plans and to improve the competency of those that implement them. We run an Institute of Leadership Management (ILM) accredited incident management training programme every year, delivered by an external specialist company (Skills2Share) which is targeted towards incident managers and responder and people on standby rotas. The courses cover all incident levels. This training compliments the technical training, experience and competencies people receive through their normal employment or specific to their incident roles. Training and exercising is covered in more detail in section B4 below, but our flexible approach meant we had a large pool of people with good awareness of incident management practices to draw upon throughout the incident. People leading or taking a major role in the response were already familiar with the environment, their roles and the incident management process. Therefore the people and processes were in place to manage it.

41. We also have a proactive approach to engagement with LRFs and have built good relationships with them. We attend LRF meetings when we can and support and present at their events. We've developed and shared an information booklet to raise awareness of our issues and we've hosted a number of LRF engagement days at Severn Trent Centre. In 2015, working closely with West Mercia LRF, we developed guidance to support LRF planning for supply interruptions that was shared with the secretariats and is available through Resilience Direct. This activity and the subsequent roll out helped us gain much greater understanding of their key concerns and how they can help us.

42. We have mutually agreed clear triggers for engaging with LRFs, purposefully set below those normally defined for a major incident, so we engage with them regularly during smaller incidents for either awareness or support. We include LRFs in the major company exercises (referred to above) and take part in events and exercises they organise.

43. Consequently, we had no hesitation in contacting them early during this incident and understood how to work with them effectively. We maintained regular contact with each LRF affected throughout the incident and actively participated in multi-agency Tactical Coordinating Groups (TCGs) when invoked, attending in person where possible or by conference call where more appropriate. This meant we were able to make decisions collectively where required, for example, their views on the best sites for bottled water hand out locations. Thus we increased our intelligence of the communities affected, rather than just relying on the information we had

from our network monitoring. It also meant we had access to more information on sensitive and vulnerable customers and their individual requirements.

44. Familiarity with our processes across the Executive Committee meant the incident was quickly escalated to "Strategic" level on 4th March 2018. The Strategic Incident Room was established and there was continuous, rolling Executive leadership of our incident response from that point. Ahead of that trigger point (and in line with our incident management plan) our Strategic Leaders and Business Leader populations were managing our Tactical and Operational responses, including our preparatory actions, whilst keeping our Executive Committee informed of developments. Furthermore 9 of the 10 members of our Executive Committee were also involved in some capacity during this incident from leading the incident team, to overseeing bottled water stations, visiting vulnerable customers and liaising direct with MPs, LRFs and other key stakeholders and fronting media interviews. The only one not involved was out of the country on leave.

45. As outlined above, the preparations related to our incident plan were central to our ability to respond effectively. As detailed further in Section F, we are in the process of reviewing, as we do after all incidents, how that plan and the procedures within it might be evolved in the future and to take on board the experience from this incident.

46. The preparations around resourcing and its development as detailed in Section C were successful. We were quickly able to mobilise teams at each incident level and adequately populate all workstreams as the incident escalated. We also had good resourcing levels in the field, both from scheduled standby staff and from others that had made themselves available in advance. This is evidenced by the average time to fix bursts through the incident period of the 4th to 9th March inclusive.

47. The impact of our customer communications is detailed in Section D below.

Question B3: What emergency plans were in place and were they adequate to cope with the problems? Were those emergency plans appropriately enacted? If so, when?

48. Our emergency plans, which cover a wide range of scenarios such as, for example, [redacted], form an integral part of incident planning procedures and plans. An explanation of our incident management structure and response is set out in Section B2.

49. There were clear, well tested plans for responding to leaks and bursts, to provide continuous supplies through tankering into the network, for the provision of alternative supplies and for identifying the areas affected by issues on the network.

50. The plans themselves were adequate for an incident, even one of a significant size. The knowledge and expertise of the Network Control Team meant that the available water resources were managed in such a way that, wherever possible, outages were prevented and the highest risk areas could be focussed upon.

51. The Strategic Incident Management Response Plan, which provides the overall framework, was also fit for purpose, meaning the Strategic, Tactical and Operational responses were well defined, operated at a good rhythm and supported each other. We also had tried and tested procedures for maintaining contact with external agencies, including DEFRA and the LRFs.

52. As detailed in Section A1, the severe weather conditions resulted in our Operational Bronze incident level being triggered on March 1st because of the continuous freezing weather. The incident level was then rapidly escalated to Strategic incident level on the 4th March and continued at this level until the March 9th. This trigger and escalation process worked in line with what it was designed to do, and provided a clear framework within which to respond to the incident. De-escalation triggers were set during the incident by the Strategic Incident management team. It is well-understood by our colleagues, and our people knew what was required of them to respond to the plan. Further information on the incident response actions that resulted from the application of our plan are set out in our responses to Questions C1 and C2 below.

53. As noted above (and discussed further in our response to Question F1) we believe we have the right plans in place. However, using evidence gathered from this incident we will be re-evaluating the need for explicit freeze/thaw escalation triggers with guidance to account for specific circumstances.

Question B4: What training have your staff had for responding to severe weather events, particularly freeze/thaw incidents?

54. Training and competency is at the core of our incident preparation and response. A key part of our response capability comes from having multi-skilled staff that can be deployed flexibly across the business. Training is provided through two key forms: technical training, related to the roles

people will normally be expected to carry out during a response, and general incident management training, focussing on best practice behaviours and processes.

55. The ILM accredited incident manager training programme is delivered by a specialist company, has been running for a few years and is now well-established. The focus to date has been on training subject matter experts and leaders on operational standby to a level appropriate to that at which they would normally respond. The Executive Committee have therefore all been trained to Strategic level. The table below shows the number of people with each qualification, though some people will hold more than one qualification.

Table B3: Incident management training

Qualification	Number of people Trained
Strategic Incident Management	70
Tactical Incident Management	215
Operational Incident Management	538

56. The training contains a mix of theory and practical elements covering internal expectations as well as recognised best practice and multi-agency responses. This reflected learning from previous events, where we recognised the importance of being able to coordinate effectively with external agencies and to speak the same incident language.

57. This training compliments the technical training people receive relating to their "business as usual" roles and ensures they understand how an incident should be managed. Technical competency is either derived from an individual's day job or is provided through training by subject matter experts. Network Control run training events for new Regional Duty Leads and Control Centre staff using the recovery control room. In addition, Severn Trent have run a number of larger sessions; an incident focussed leadership event in June 2016 required mandatory attendance by all Middle Managers and Senior Managers and then a series of Continued Professional Development days in January 2017, focussed on raising awareness of water supply incident response for all operational leaders on standby.

58. The formal training is supported by a comprehensive exercise programme sponsored by the Executive Committee. This is designed to test and develop both plans and people to prepare them for incidents affecting operations and business continuity. The exercises range in size and focus and include internal and externally hosted events. In the year ending February 2018 we ran 13 internal exercises, excluding training events, and took part in 8 external multi-agency exercises.

59. As detailed in B2 above, each year we hold a major companywide exercise based around a large scale loss of supply. These are run with a full strategic team in place. These have been very successful and highlighted areas of improvement for individuals and in plans that directly contributed to the response to this thaw incident, most notably the awareness of the strategic incident management structure, the management of alternative and continuous supplies and our external communications. Our exercise this for year, Exercise Eaglemount, was planned for

the 28th February but was proactively postponed because of the weather forecast. This has been rescheduled for later in the year and has been based on a major water supply event to be played in real time. Those involved in the development have been extended and will include Severn Trent Water, Dee Valley Water, our incident management training provider (Skills2Share), Nottinghamshire, Derbyshire and North Wales LRFs, DEFRA, Welsh Government and the National Cyber Security Centre.

Question B5: What did you learn from previous incident management events, including through working with other water companies, local / regional partners, emergency services or other service providers, and how is this reflected in your current processes?

60. Our plans and procedures reflect the learning and gathered over the years of dealing with incidents and emergencies of all sizes. The Wholesale Incident Management Pack 2018 contains triggers based on experience of when events become issues and the structures and processes that have been required to manage them effectively. As mentioned elsewhere in this report, these documents are constantly reviewed and updated.

61. Where possible we also review our plans against significant incidents experienced by other water companies, an example being United Utilities' Franklaw event. It is rare that we work with other water companies during events, except for the occasions when we provide or receive Mutual Aid. Our reflections on interaction with other water companies for incident management is covered in more detail in Section F.

62. We have established procedures to provide for thorough review and lessons learned processes on a cross-business basis. Operational triggers for a "deep dive" review are based around the number of properties, the period of time or the size of an asset affected by the incident. Incidents that hit Operational Silver, Tactical or Strategic levels are also reviewed. We also review all major exercises and use these to refresh the plans where required.

63. We are always keen to learn from the LRFs and their member organisations and have attended a number of incident reviews in recent times. Feedback from these events range from very specific issues, such as how we supported a particular school or issues with traffic management, to broader topics such as engagement and escalation. We are always keen to attend these sessions and to incorporate the findings into our procedures.

64. Implementing improvements is managed in a number of ways. Actions from the "Deep Dive" reviews are logged and tracked against the individuals; the Security and Resilience Team own the incident management framework documents and review those after significant events; improvement project teams are established where it is felt a fuller review is required and there is an internal Community of Practice that meets regularly and brings together incident management specialists and stakeholders to share best practice (including that from other sectors).

65. The key learning points from more recent incidents and exercises now included in our approach to incident management are outlined below.

- We have made significant improvements to the way social media is managed during incidents. A 24/7 social media team is put in place and linked to the media team to ensure they have access to the most up to date messages and can pass on information from customers.
- We recognise the effectiveness of proactive text messaging of proactive SMS messaging as a means of communicating key information to customers and have made this part of the standard processes.

- We have a process to increase the capacity of the website during incidents, recognising that this is a critical communication route to customers and stakeholders. [redacted] This is an area where we will seek to implement further improvements and a more robust process.
- We've reviewed the structure of the communications and media team and implemented a new rota to support Tactical and Strategic incidents and to ensure there is always a media representative attending LRF meetings in person or on conference calls.
- We recognise the benefits of more proactive contact/relationships with local media (TV and radio) as a means of increasing opportunities to communicate through those channels.
- We have also worked regularly with a specialist media company in exercises and in general to upskill the media team and for media training, to ensure we have the right skill set and a range of spokespeople able to deliver media interviews.
- We've made developments to our GSS compensation arrangements and put a clear policy in place.
- We reviewed our triggers for engaging with LRFs and now contact them for all Operational Silver or higher level incidents.
- We actively engage with LRFs for both planning and response to maintain a good level of awareness of issues concerning water supply interruptions.
- We understand the benefit of attending LRF incident meetings in person rather than just attending conference calls and now aim to achieve this wherever possible.
- We have formalised the use of a dedicated and appropriately designed and resourced strategic incident management room at Seven Trent Centre in Coventry.
- We've also established county based incident rooms to provide field locations for field team coordination.
- A change was made to the alternative water supply providers after a review of the incumbent's quality of service.
- We recognised that some workstreams were very work intensive and have split them out in the structure for large incidents so they receive the right level of focus and resourcing. In particular this applies to alternative supplies and continuous supplies (where water is tankered into reservoirs or pumped into the supply network so customers don't see any interruption to their supply from the tap.)
- New standby rotas were established and populated to ensure the new Alternative and Continuous supplies workstreams can be stood up individually at any time.
- Additional standby rotas were also established for emergency planning (Security & Resilience), welfare (Property) and resourcing (Human Resources), so specialists can be brought in when needed to support the incident management team.
- All workstreams have reviewed their response plans and included details of how they can be escalated to cope with increasing scales of response. The evidence from the Freeze/Thaw incident shows improvement in this area as the incident team was well resourced with three levels of coordination in place.

66. There are a number of further identified improvements that are still in the process of being developed and implemented, as detailed in Section F below.

C. Incident response

Ofwat: We want to understand how companies responded to the incident, including how it prioritised action and how the Board and Executive were involved in the process.

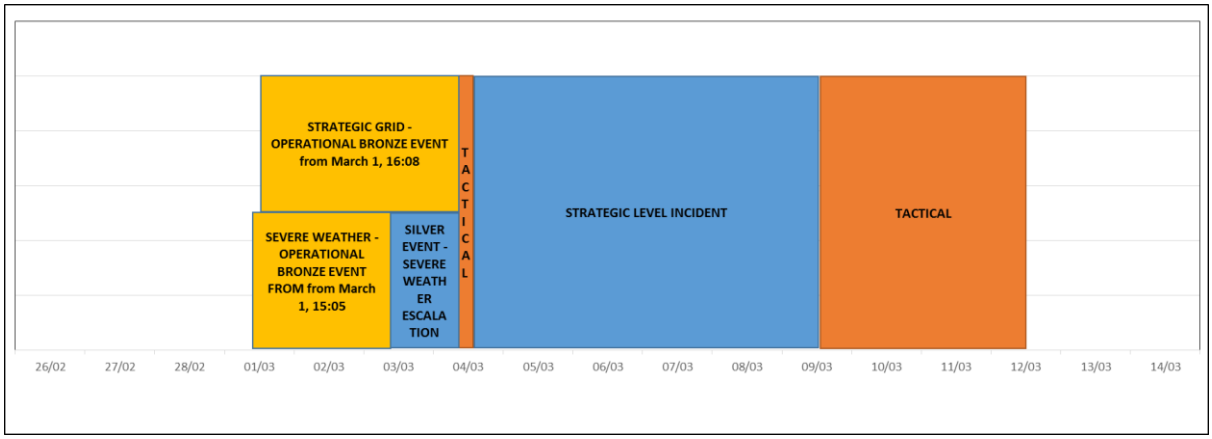
Question C1: Provide details of your established processes for responding to issues during severe weather events, particularly late winter freeze/thaw incidents (e.g. operational, governance, communications, working arrangements with other authorities through local / regional partnerships). Were these processes effective during this incident? In your response, make clear the role of your Executive in any decision making within these processes.

Governance and Incident Management Processes

67. Within each operational function, Winter Preparedness Plans were reviewed and assured by the Executive Chief Engineer in anticipation of severe winter weather conditions. An example plan is shown at Appendix C1.

68. As was set out in Section B, we have well established incident management processes and procedures that are regularly reviewed, tested and updated. These arrangements are set out in detail in our Strategic Incident Management Response Plan (2017) and Wholesale Incident Management pack (2018) - Appendix B1. Within this document the escalation triggers are prescribed along with the establishment of the incident structure for instances of extreme weather.

Figure C1: Incident Escalation Timeline



69. As shown in figure C1 above, the bronze incident room was established on 1st March and escalated to strategic command as prescribed triggers were breached at 17.30 on Sunday 4th March. From this point to de-escalation a member of the Severn Trent Executive Committee was present in the incident room leading through our Strategic Command structure in the role of "Strategic Commander". The three Executive Committee members covering this role through the incident were:

- James Jesic – Managing Director of Production
- Sarah Bentley – Chief Customer Officer

- Martin Kane – Chief Engineer

Role of the Executive and Senior Management

70. All of the Executive team have been fully trained in Strategic Incident Management. Accordingly the Strategic Commander had full accountability for decisions made during the incident response. Examples of these decisions include:
    - Escalation to strategic incident and establishing the strategic incident structure
    - Resourcing of incident work streams and command of the work stream, including the de-prioritisation of 'business as usual' activity to release additional resource.
    - Prioritisation of vulnerable customers and provision of additional tanker support to hospitals and prisons
    - Ensuring water quality was a priority throughout the incident
    - Instigating Local Resilience Forum contact
    - Incident de-escalation triggers
    - Approving all communications to customers, employees and all other stakeholders, the details of which are contained in Section D of this report.

71. Members of the Executive Committee also took lead roles in incident work streams, manning bottled water handout stations, conducting media interviews and being the liaison point of contact for LRFs. Only one Executive Committee member was not involved as they were out of the country on annual leave.

Working with Other Authorities

72. We recognise the value of the LRFs and we quickly established a collaborative approach with Coventry, Warwickshire and the West Midlands at Tactical Coordinating Group (TCG) level. In Leicestershire we collaborated with the LRF leadership team although they elected not to formally convene. In hindsight we were less effective in communicating with the Derbyshire LRF and this forms part of our lessons learned as defined in Section F of this report.

73. A TCG was established with Coventry and Warwickshire on Sunday 4th March and concluded on 6th March. An incident room covering both counties was opened in Coventry and Senior Managers and Executives supported that in person on numerous occasions. We attended every conference call hosted by the LRF and provided regular updates on the incident situation to members of the LRF throughout the incident. We collaborated with members of the LRF (e.g. NHS, Local Authorities etc.) on issues such as vulnerable customer location, traffic management, fire service, bottled water locations and potential volunteers. On 6th March the Coventry / Warwickshire LRF was closed down as the Meridan and Barby reservoirs were recovering well and no customers were off supply.

74. As a precautionary measure based upon the potential risks to the population served from the South West Birmingham reservoirs (which had been discussed throughout the Coventry / Warwickshire LRF) on 6th March we established a working relationship with the TCG for the West Midlands to manage that area. This was chaired by Birmingham City Council and run from the incident room at Lancaster House. On 9th March the TCG was closed down as the West

Birmingham reservoirs were sufficiently recovered. We continued to provide information to Birmingham City Council on reservoir levels through to Monday 12th March to given them confidence in the continued recovery.

Overall Views on Effectiveness of our Processes

75. Our review of the incident thus far indicates that our pre-established incident response procedures provided an effective framework for tackling the events that were faced. They provided a clear and well understood basis for rapid mobilisation and prioritisation across our area in response to difficult circumstances.

Question C2: For this incident, please describe how your company went about deploying the resources required to respond to the incident. In responding, please detail the scale of resource deployed and from which parts of the business and/or external resources (eg supply chain, local / regional partners, business retailers) they were drawn.

People Resource Deployment Approach

76. In line with our SIMRP, we established a resourcing work stream, which produced a people resource plan for all roles, defined as required, within our Wholesale Incident Management Pack. This resource plan ensured that we had sufficient numbers to cover the complexity of the incident throughout its duration.

77. On the 7th March the Strategic Commander evoked a derogation of our Working Time Policy to reflect the magnitude of the event whilst ensuring adequate consideration to the health, safety and welfare of our people. This was for specific roles/skills, including Senior Managers and various operational roles within the business.

78. We established county-based incident rooms providing 24 hour coverage, and activated a 24 hour work stream in Severn Trent Centre for strategic leader co-ordination and communications. Our county-based incident rooms were as follows:

- Warwickshire – Finham
- Nottingham – Hucknall Road
- Derbyshire – Raynesway
- Leicester – Leicester Water Centre
- Central – Edgbaston
- Gloucester / Worcester – Staverton
- Shropshire - Shelton

Other Resources Deployment Approach

79. In line with our Wholesale Incident Management Pack and our asset specific contingency plans (explained further in section C3), we:

- Created tanker plans to support recharge of the network and sensitive non-household customers.

- Mobilised our bottled water contract with a supplier who assured a supply of water amounting to 300,000 litres per day. We ensured that vulnerable customers received water directly at their properties and arranged for bottled water stations to be established both in discussion and agreement with the LRFs.
- Postponed all remaining planned work on the network which had not been postponed proactively prior to the incident and prioritised resource onto leakage find and fix activities.
- Established a fast track approach to reduce job processing times for leaks on our network reported via any channel this included repair prioritisation.
- Cancelled other lower priority work such as meter reading, non-regulated work and postponed new connections.

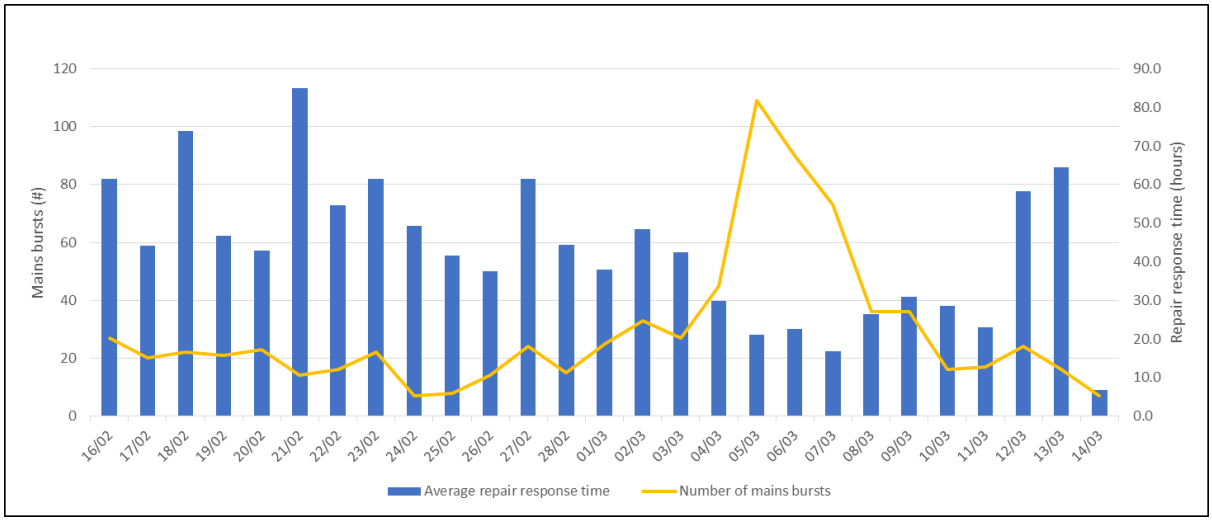
Scale of Resources Deployed

80. As a result of our incident planning procedures we were able to quickly and effectively mobilise a dedicated incident response team consisting of over 500 extra field-based staff focussed on finding and fixing leaks, as well as more than 1,150 additional shifts by our central incident response team over the course of the incident.

81. All of our operational repair gangs and Distribution Service Technicians (DSTs) were managed through our county-based incident rooms which reported through to tactical conference calls every 2 hours. An increased level of operational resources were mobilised to respond to the freeze/thaw incidents. This included resources from our supply chain partners. The total number of DST shifts worked between 4th March and 9th March was 861 (an average of 144 per day). The use of other operational gangs (for example, re-directed from new connections work) allowed for a further operational response (on average of 11 gangs per day).

82. The effect of this redeployment can be seen in Figure C2 below. A combination of our fast track approach to job processing, resource redeployment and liaison with the LRFs resulted in a reduction in our average repair response time during the incident.

Figure C2: Average repair times



83. Our non-operational staff, including our Executive Committee and Strategic Leaders, also provided a wide range of incident support roles:

- The overall participation level for Executive and Strategic Leaders was significant (75%) across a variety of customer facing activities and 'command' leadership.
- Across the Severn Trent non-operational functions (Finance, HR, Commercial, Meter Reading, Customer Liaison, Communications etc.) over 550 people operated across multiple work-streams in co-ordination and non-technical roles so to ensure that operational resources/ leaders were utilised primarily for their technical capability.

84. The scale of the response provided by our non-operational staff is shown in Figure C3 below in terms of the different activities that provided. Table C1 provides a further breakdown of that participation which highlights the roles played by our Senior Managers and Executive.

Figure C3: Non-operational Staff Deployed on Incident Related Activities

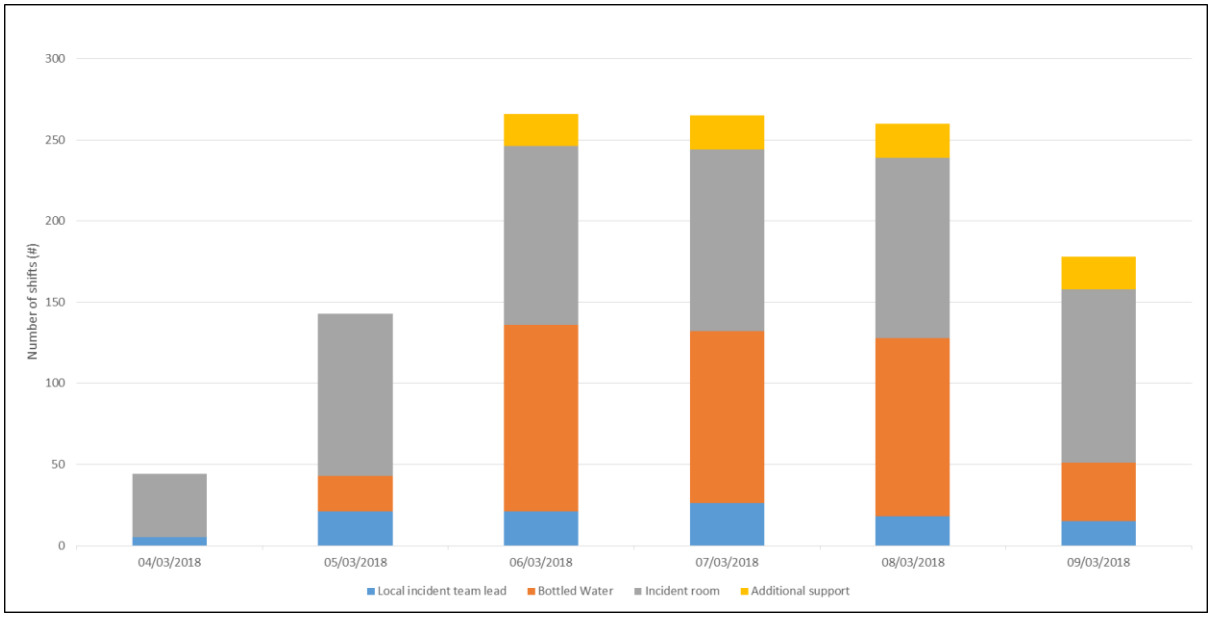


Table C1: Incident participation summary

Overall Participation levels	Count of individual employees deployed
Bottle Station Volunteers	278 Includes 3 Executive team members / 8 Strategic Leaders
Incident room overall 24 / 7 coverage – 4th March to 9th March	249 Includes CEO / 5 Executive team members / 33 Strategic Leaders
Customer contact (additional resources)	43 additional resources into digital channels
Technology support (additional resources)	26 additional resource across technology teams

Other additional resource (also including Property / Welfare)	13 additional resource (of which 5 in Property)
Executive team participation	*9 members active through the period, 1 on leave*
Strategic Leader participation	*38/52 led across various work streams throughout the period*

Alternative water supplies

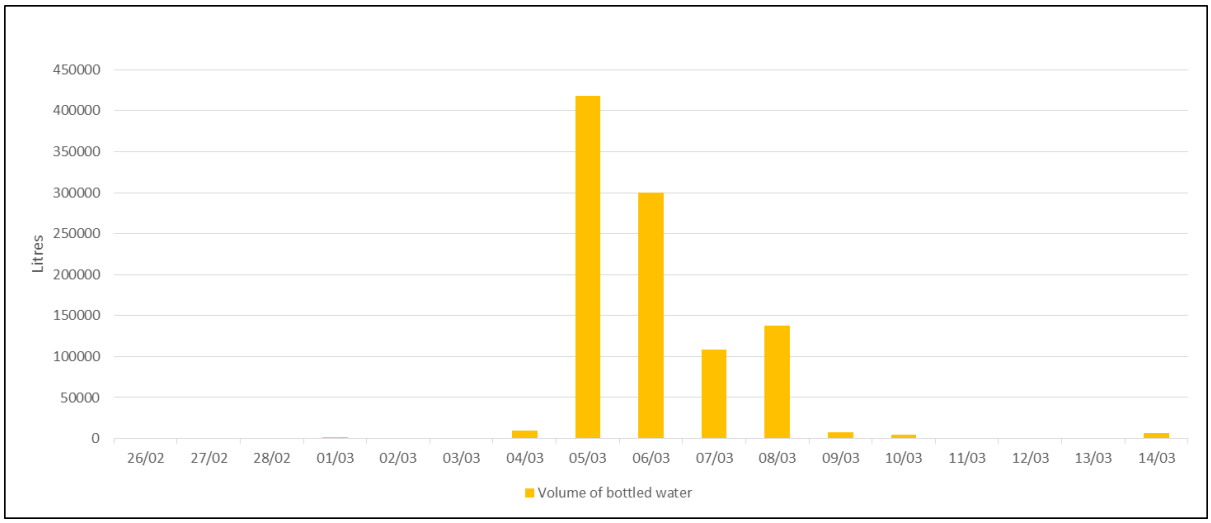
85. As stated earlier in this section, we created tanker plans. On the 4th March, we focussed on sensitive non-household customers and as it became clear which areas of our network were most vulnerable and would benefit from tankering, we mobilised our full fleet. By the 5th March we had deployed 27 tankers, an additional 4 on the 6th March and the final one on the 7th March. This is shown in table C2 below.

Table C2: Operational tanker deployment

		Sunday 4th March	Monday 5th March	Tuesday 6th March	Wednesday 7th March	Thursday 8th March	Friday 9th March
Total	Total Tankers out	3	27	31	32	32	21
Total volume of tankers per day (L)		54,000	435,000	516,000	498,000	489,000	342,000

86. We recognise the extent of the inconvenience and discomfort of those who have their supplies interrupted and the importance of immediately available bottled water stations. We sought to make these as accessible and easy to use as possible, and agreed locations through the LRF process. We set up 11 bottled water stations that operated mostly between 06:30 and 22:00 on the various days they were operational. The overall volumes of bottled water provided are shown in Figure C4.

Figure C4: Alternative supply distribution volumes



87. Table C3 below shows the locations of the bottled water stations that we set up.

Table C3: Bottled water locations

Bottle station
Frankley Beeches Sainsburys, Northfield, Birmingham
Tesco Superstore, Rugby
Tesco Superstore, Solihull
Sainsbury's Arnold, Nottingham
Cannon Hill Park Nature Centre, Edgbaston, Birmingham
Shawcroft Centre, Ashbourne
Ricoh Arena Car Park C, Coventry
Lutterworth
Sainsbury's, Market Harborough
Market Place, Buxton
Sudbury Hall, Derby

Question C3: Provide details of how your company assessed the operational implications and prioritised its responses during the incident period.

88. Our procedures for assessing the operational implications of the circumstances we were faced with during the freeze/thaw incidents were in line with those set out in our incident management plan. This was established by our Strategic Incident team and included the strategic objectives for the incident. These guided all actions and priorities and were updated during the incident under direction of the Strategic Commander to reflect the phasing of the incident (deployment, rectification, restoration, and demobilisation).

89. Every operational asset has an Operational Contingency Plan which provides clarity on the operational implications of scenarios, including response options. These are held in our

corporate information repository (Waterpedia). Every document is available to all incident resources on their mobile devices remotely and were used extensively throughout the incident. It is worth noting that each document has a review date with an associated reporting mechanism to ensure compliance.

90. Throughout the Incident the central and Strategic Incident Team were provided with a centralised analysis of data such as pressure, flow and customer contact volumes and locations. This data combined with the Wholesale Incident Management Pack and our Operational Contingency Plans supported decision making. The Wholesale Incident Management Pack (2018) also defines decision making rights through our command structure.

[redacted]

Question C4: What challenges/barriers did your company face in resolving problems that customers experienced? How did you overcome them?

92. We faced a number of challenges when seeking to restore supplies to customers in rural areas that were difficult to overcome. These challenges contributed to the length of time over which some of our customers had their supply interrupted.

Customer-side leaks

93. A large proportion of the increased water demand was driven by customer-side bursts creating challenges for conventional leakage reduction strategies. The subsequent reduction in demand is a function of the speed at which customers are able to get their bursts repaired and will be dependent on the availability of private burst repair services (including those provided through insurance businesses). Consequently a Strategic Commander decision was made on 5th March to offer additional support to customers in Northfield (Birmingham) to resolve significant private side leaks.

Leaks from void/vacant properties/commercial properties that were not operating over the weekend on the 3rd and 4th March

94. Where properties are void/vacant, private-side bursts may go undetected for some time and result in high ongoing levels of leakage that put continued strain of supply capabilities. To support this we redeployed meter reading staff to investigate potential leaks on void/vacant properties across all affected areas. Where leaks were found an attempt was made to disconnect these properties. One example of this was found on 6th March in Birmingham where a leak on an old fire main was found which equated to approximately 40m3/hr.

Snowfall and further extreme weather

95. There was considerable snowfall across the area prior to the thaw incident. In some rural parts of our region, snowfall and depth was excessive and persisted after the thaw began. This presented difficulties for a number of reasons:

    a. The extent of snow on the ground hindered leakage detection and access for repair work.
    b. There were a number of road closures as a result of snowfall that affected access.
    c. While the use of snowploughs improved road conditions for transport purposes, it hindered detection and repair work in a number of locations because it resulted in high piles of snow on verges where access was required to progress works.

96. Figure C5 below illustrates the extent of the challenges that staff faced particularly in Derbyshire in identifying and rectifying problems.

Figure C5: Examples of snow conditions

Air-locks in rural areas

97. The general topography of some of our rural networks can result in a susceptibility to air-locks occurring after an interruption event. The length of connecting pipes in rural localities can make the resolution of air-locks a time intensive activity. In practice, this activity was further hindered during the freeze/thaw incident by the levels of snow on the ground described above. This resulted in extended periods without supply for some customers whilst air was bled from the mains.

98. In some areas, further bouts of inclement weather led to secondary bursts on customer pipes and our network across some isolated areas. This effectively extended the resolution of issues in some of the more rural parts of Derbyshire.

Question C5: Provide details of how your company identified customers in vulnerable circumstances before, during and after the incident. What support was offered to these customers and how was this delivered?

A response to this question is provided in Section D, question 1B.

D. Communication and support

Ofwat: Regular and informative communications are especially important during major incidents. We want to understand how water companies communicated with customers and wider stakeholders during the incident.

Question D1: How effective were your communication processes before, during and after this incident for each of the below:

a. **Customers? (residential and business);**
b. **Customers in vulnerable circumstances and business customers for whom a water supply is critical (e.g. hospitals, schools)?;**
c. **Water retail businesses?; and**
d. **Wider stakeholders? (e.g. local authorities, other agencies, Government, Ofwat)**

Introduction

99. Our Communication strategy for incidents puts emphasis on being preventative before, and then proactive during an incident. We have well-practiced and well-documented communications protocols and procedures for incidents as an integrated part of our Strategic Incident Management Response Plan (SIMRP). Our Communication, Customer Contact and Social Media teams take part in several mock communication incident exercises a year, as well as some additional companywide ones, so that we can practice and refine our response. These are either conducted and assessed, or supported by an independent media agency.

100. We fully activated and carried out all our communications processes beginning on Sunday 4 March and continuing for the duration of this incident in line with our SIMRP. This included mobilisation of our complete communication, customer contact and social media response team 24/7 for the duration of the incident.

101. We used a range of channels to ensure that we could reach as many customers as possible. These included outbound proactive communications such as proactive SMS text and voicemail updates that were sent directly to customers' phones, website updates, proactive Twitter and Facebook posts, liaison with local radio, TV and press, and regular stakeholder updates. We also liaised directly with our vulnerable customers, prisons, hospitals, care homes, farmers and schools.

102. We also significantly bolstered our contact centre and social media teams to manage the higher than normal inbound queries. These included calls via our contact centres, web chat, social media and we put our Incident Recording Messaging System live. These are recorded voice messages that we can programme to be live for customers calling into our contact centres from particular areas. It means that customers get a pre-recorded message that updates them immediately and they do not have to wait to speak to an advisor. We found the use of proactive

SMS messaging and social media to be particularly effective approaches, and we used them much more extensively than we have for previous incidents.

Communications before the incident:

103. We issued our standard proactive winter weather advice in December 2017 in line with our winter readiness plans and information was posted on our website. We then focused on preventative communication again before the incident and issued two further key updates for customers. Once we knew cold weather was expected, we issued a winter weather alert on Wed 28 February 2018 asking customers to prepare for the cold weather and specifically to lag their pipes. This was issued as advice on our website, social media and as a proactive press release to all the media in the Severn Trent area. We also conducted local radio interviews to support this and issued several subsequent proactive social media updates over the following days.

104. Secondly, we issued an update on our website and a proactive press release on the afternoon of Sunday 4 March to all of the local media asking customers to report leaks and telling them how to report leaks to us.

Communications during the incident:

105. A detailed breakdown of our communications response during the incident is described below by customer type.

Residential customers

a. **Outbound: Proactively contacting customers directly to provide updates**
   - We issued regular area specific SMS text and voicemail updates to customers' phones in the affected areas. In total over 852,000 messages were sent.

b. **Outbound: Proactively issuing updates via publicly available channels:**
   - We issued 91 separate website updates and had 1.6 million hits on our site. During the evening of Sunday 4 March, the traffic to our website increased significantly. This caused our website to intermittently not be available from around 7:30pm. We worked quickly to increase capacity and managed to fully restore the sites availability by 9pm.

   - We issued 45 proactive Twitter or Facebook updates which helped reach c1.9m views on Twitter and c277,000 people on Facebook.

   - We worked proactively with the media, and provided 110 media updates and conducted 17 TV and radio interviews which helped to generate over 700 TV, radio and press updates for customers.

   - As per our normal SIMRP processes, we set up effective internal communication channels between our field and communication teams. This allowed our

communications team to publicly issue photographs from the field so that customers could better understanding work we were doing and of some of the challenging conditions being faced.

- We moved quickly to proactively announce our compensation arrangements on Tuesday 6 March. These were well above our GSS payments (as set out in Section E). We agreed these in advance with CCW and issued a press release and posted the information on our website. We also conducted some media interviews on compensation and our Chief Customer Officer recorded a video for customers that was posted on our website and issued to the local media. This can be found in Appendix D1.

c. **Operating a 24/7 response team directly for customers**

- We always run a 24/7 customer contact centre with multiple channels, and during incidents we significantly increase resources to support inbound customer queries. That involves deploying teams from our debt recovery, training and billing teams who we have already been trained to support customer queries related to incidents, with some colleagues agreeing to cancel holidays and offering overtime. This helped us to handle a total of 25,095 customer calls into our operational contact centre during the freeze-thaw incident compared to 8,212 for the same period in February. These peaked at over 9,000 calls a day (5 times our normal volume). Please note that this is a sub-set of the "total number of customer contacts by phone" captured in Data Table 1.

- We also have an IRMS (Incident Recording Messaging System) which provides recorded voice messages that we can programme to be live for customers calling into our contact centres from particular areas. It means that customers get a pre-recorded message relevant to their local area and which updates them immediately so that they do not have to wait to speak to an advisor, but also can do so if they prefer personal contact. We regularly updated our messages throughout the incident and it was accessed 26,502 times by customers.

- We always provide a 24/7 social media response and during this incident we significantly increased our regular team to provide an additional 527 man-hours of support. This meant we were able to respond to every customer Tweet that required a response (1,463 out of 1,509).

- Our analysis of social media sentiment shows that 80% of posts we received from customers were either positive or neutral in tone. Our overall social media sentiment score was more positive than negative over the duration of the incident – as measured by our social media management system Hootsuite.

- As part of our SIMRP, we also had Communication team members or senior staff at every bottled water station to ensure a regular flow of information between the water stations and the incident room. We set up internal communication

channels that meant we could provide timely updates to the water stations and could triage customer queries from our water stations.

Vulnerable customers

106. We maintain a Priority Service Register (PSR) through which we manage our engagement with and response in relation to customers in vulnerable circumstances. Customers on the list are in one of the following three categories:
    a. High risk individuals (for example, those on dialysis)
    b. Individuals with mobility impairment.
    c. 'Notify only' individuals: individuals for whom our response will be reactive (i.e. additional support will be provided on request rather than automatically).

107. Our customer service agents proactively called all high risk PSR customers in the impacted areas to notify them that bottled water supplies were on the way. We then endeavoured to call all our other registered vulnerable customers on our PSR, prioritising individuals with mobility impairment first before our 'Notify only' individuals.

108. Supplies were mobilised quickly and started to be delivered within 4 hours. Our alternative supplies team arranged for door step deliveries of bottled water to all high risk PSR customers and our records show that the volumes of water delivered exceeded the minimum quantities to fulfil all our obligations to our vulnerable customers. We delivered water in person to 5,271 vulnerable customers in total.

109. Calls from 'notify only' PSR customers, and from customers not on the PSR but identified as being in vulnerable circumstances through them self-identifying themselves to us or via the LRFs, were responded to on a reactive basis. Calls from these customers resulted in door step drops of bottled water being arranged by our alternative supplies team.

Non-household customers for whom supplies are critical

110. In line with our Security and Emergency Measures Direction (SEMD), our Sensitive Non-Household Customers include hospitals, care homes and prisons. Hospitals and prisons maintain their own contingency plans on how they will be supported during a supply interruption. However, during the incident, we proactively contacted the hospitals and prisons in the affected areas to agree how we would provide alternative supply arrangements if they suffered an interruption to supply which were activated in some circumstances.

111. We also proactively identified all the care homes in the affected areas and contacted them directly to identify the number of patients, if they required bottled water and the volumes they needed. We delivered bottled water to 58 care homes throughout the incident.

112. Whilst a number of schools were closed as a result of the weather conditions, we collaborated with the LRFs on our school liaison. We called a number of schools in the East Midlands at risk of a supply failure to offer alternative supply arrangements that would allow them to remain

open if they wished. We missed one school in Derbyshire and that school closed for one day because of loss of supply. No other schools closed because of an interruption to their supply that we are aware of.

Business customers and water retailers

113. We posted some updates on our Retailer portal. We also liaised directly with a number of retailers by phone and email. If we were contacted directly by businesses customers, we provided further information directly to the business customers affected.

114. We were contacted by several farmers or their retailers, and responded by phone in order to offer a range of alternative supplies and we delivered them to several farmers. Our Managing Director of Production and our Head of Communications also personally visited a couple of farmers in Derbyshire after the incident to hear first-hand about their experience. We will be working closely with our retailers after the incident to review the best approach for business customers with livestock going forward.

Local resilience forums (LRFs)

116. For potentially impacted areas, we contacted emergency planning contacts (out of hours contacts) to make them aware that their area may be affected.
    - For impacted areas, we checked the completeness of the Priority Service Register with LRFs (a process we can only undertake during an incident due to data protection laws).
    - For Birmingham, Coventry and Rugby the LRF Tactical Control Group was activated, and more regular contact was maintained.
    - We had a member of our Communication team present during all calls and meetings with the LRFs to ensure joined up communication. We encouraged the LRFs to share our website and social media updates via their channels as well.

Wider stakeholders

117. In line with our normal communication protocol during incidents, we worked to proactively keep all our stakeholders regularly updated. In total we issued over 200 proactive updates (195 written, 5 verbal) to our wider stakeholders. Our engagement consisted of the following:

a. We sent individual emails to all the MPs in our area, and engaged in more regular briefings with those who wanted to be able to share news with their constituents. We would like to acknowledge the support they provided in helping us to communicate and engage with their constituents.

b. We issued regular updates to our Regulators and their press teams including Ofwat, CCW, DEFRA, DWI and EA. The effectiveness of these received positive feedback. Our CCW Chair Bernard Crump also praised the Severn Trent response to the incident including our engineering response and the provision of bottled water live on BBC Radio Derby.

Communications after the incident

118. Our main communications after (but concerning) the incident have so far been the following:
    a. We issued an apology and thank you to customers after the incident via an update to our website, a press release and proactive social media posts.
    b. We ran adverts in the local media to apologise to customers and thank local partners and the community for their support throughout.
    c. We issued our customer satisfaction survey 'Pipe-up' to all potentially impacted customers after the incident.
    d. Our MD of Production and Head of Communications visited impacted customers and farmers to hear about their experiences in the Ashbourne area of Derbyshire.
    e. We moved quickly to announce our compensation arrangements which were well above our GSS payments (as set out in Section E). We agreed these in advance with CCW.
    f. Our MD of Production and Head of Government Affairs met with the Leader, Deputy Leader, Director of the Environment and Head of Civil Contingencies of Derbyshire County Council on Thursday, 29 March.
    g. We are following up with all the schools we had contact with during the incident to offer them workshops or assemblies with our education team.
    h. We followed up with our vulnerable customers to ensure that they were back on supply and didn't need any further alternative supplies. We are also in the process of following up with any new vulnerable customers who contacted us during the incident to add them to our PSR and discuss our wider vulnerable customer support programmes that might be available to them.

In Summary: The effectiveness of our communication response

119. Over the last two years we have made a huge step change in the effectiveness of our communications during incidents. We have placed significant focus on it as new channels such as social media have changed the communication landscape and as customer expectations have changed. We now have well-practiced and well-documented communications protocols and procedures for incidents as an integrated part of our SIMRP as detailed above. The improvements have been recognised by several of our stakeholders including the DWI and CCW, but we know there is always more we can do.

120. Broadly, our communications approach was effective during the incident with the following highlights:

    a. We fully activated and carried out all our communications processes from 4 March and for the duration of this incident. We mobilised enhanced communication, customer contact and social media response teams 24/7 throughout the strategic event which on the whole worked well.
    b. We found the use of proactive SMS and voicemail messaging and social media to be particularly effective approaches, and we used them much more extensively than we have for previous incidents.
    c. We were also able to issue a huge volume of communication across a very wide range of channels to suit all customer types and ensure all customers had a method of being kept updated – including whether they were online or not
    d. Our widespread use of proactive channels meant we reached high volumes of customers with regular updates. This all helped to contribute to a social media sentiment score that was more positive than negative over the duration of the incident.
    e. Our proactive work with the media also helped to generate a lot of regular updates through mass channels on TV, radio and the local media for customers too – which was particularly important for customers who were not online.
    f. We worked quickly to announce our compensation arrangements for customers and quickly processed these after the incident
    g. We followed up with customers after the incident through a range of channels including local media and adverts, a customer survey and even had Executive and Senior leads meeting customers, farmers, retailer and business customers to better understand their experiences

121. We know there is always more we can do though, and these are the things we will be prioritising as a result of this incident:

    a. We will improve and refine our liaison with retailers and business customers. Our Head of Customer Strategy and Experience already has meetings set up to explore this. This will also explore how we can enhance our approach for farmers and schools.

    b. While there was a high volume of updates throughout the incident and they were issued regularly, we recognise that on Monday 5 March we relied too much on online channels specifically in rural parts of Derbyshire and Leicestershire. That was particularly relevant because of some of the more rural customers couldn't always access the internet or phone signal. On Tuesday 6 March we started to work more proactively with the local media, including local radio and TV stations in the area, and issued more direct communications via SMS and voicemail messages for these areas. We are also working with Derbyshire Council and the local LRF to refine our processes for rural communities.

    c. During the evening of Sunday 4 March, the traffic to our website increased significantly. This caused our website to intermittently not be available. We worked quickly to increase capacity and restore the site quickly. Our existing processes should

automatically enhance capacity when an incident is in place, but due to human error this was not followed on this occasion. We will therefore be carrying out further training with the teams involved and exploring how we improve this in the future.

d. We will be comparing our vulnerable customer lists with those of our LRFs to ensure we have everyone captured.

Question D2: What channels did you use for communication with customers and key stakeholders before, during and after the event? (E.g. local, regional or national news media, social media, e-mail, SMS, hard copy letter) What were your key messages at each stage? Please provide examples of your communications material with your submission.

122. As set out in section D1, we fully activated and carried out all our communications processes during this incident in line with our SIMRP, and mobilised our complete communication, customer contact and social media response team 24/7 throughout the incident. We used a range of channels to ensure that we could reach as many customers as possible.

Channels and messaging for customers <u>before</u> the incident

123. We used the following channels for our preventative communication before the incident:
    a. proactive press releases issued to all media in the Severn Trent area
    b. website updates and 'how to' videos
    c. social media updates
    d. we also conducted interviews to ask customers to prepare for the cold weather.

124. We had two separate pieces of communication before the incident. One to ask customers to prepare their homes for the cold weather and one to ask them to report leaks and remind them how to do so. The specific messages were:
    a. Cold weather:
        - Severn Trent are preparing for the cold weather by bringing in extra resources and we were making sure we have the right vehicles and equipment for the bad weather
        - We advised homeowners to take action now as the cold could and has led to pipes bursting and damaging homes.
        - customers are responsible for anything inside the property boundary so we offered top tips for protecting homes including lagging pipes, turning off stop taps if you're away from home, knowing where your stop tap is in case of any issues and leaving heating on low even if you're away.
        - We directed customers on how to report issues and to further information on our website including 'how to' videos at www.stwater.co.uk/winter.

    b. Reporting leaks:
        - we also issued advice and reminded to customers how to report leaks

Channels and messaging for customers during the incident

125. As set out in section D1, we had an extensive customer communications programme during the incident across a wide range of channels. In summary we used:

    a. **Proactive direct customer channels:** Regular SMS text and voicemail messages sent directly to customers phones. We also called our vulnerable customers and liaised directly with our sensitive NHH customers (including prisons, hospitals and care homes), and with farmers and schools.

    b. **Proactive public channels:** website updates, proactive Twitter and Facebook updates, we worked proactively with the media including TV, radio and press, and conducted TV and radio interviews.

    c. **24/7 customer response channels:** responding to customer queries on social media, via calls into our contact centre, via web chat conversations, via hits on our IRMs system, and during conversations at our bottled water stations.

126. During the incident, our messaging focused on providing essential updates to customers including:
    - Assuring customers that we were aware of any issues in their area.
    - Explaining the context and that the recent thaw had seen our teams called out to an unprecedented number of leaks which has put pressure on the network. As a result, we were seeing areas experiencing supply issues/ areas where customers may be experiencing their water coming and going/ or customers having no water at all.
    - We provided progress updates on repairs and supplies.
    - Confirmation that we were delivering water to vulnerable customers.
    - Alerting customers to the locations of any bottled water drops or alternative supplies available to them.
    - If applicable, advice about discoloured or cloudy water whilst supplies were restored.
    - If applicable, noting issues with air locks.
    - Reassuring customers we had extra teams out finding and fixing leaks and that we were doing everything we could to restore supplies as soon as possible.
    - Offering our apologies and that we understand how difficult it is to be without water.
    - Informing customers where they could find the latest information.
    - Announcing details of the compensation we would be paying: this was done on Tuesday March 6th.
    - We also worked closely with our field teams to obtain and publicly issue photos so that customers could better understand work we were doing and of some of the challenging conditions being faced.

    Examples of the communications materials we used through different channels are provided in Appendix D1.

Channels and messaging for customers after the incident

127. Our full response is set out in section D1, but in summary:
    - we issued an apology to our customers on our website and ran adverts on the local papers
    - we reiterated details of the compensation we would be paying with a video from our Chief Customer Officer and this was sent out to the local media and hosted on our website
    - we proactively contacted impacted customers, provided them with a customer satisfaction survey via our 'Pipe Up' system
    - we are in the process of contacting all the schools we were liaising with to offer them workshops or assemblies with our education team
    - We are following up with any new vulnerable customers who contacted us during the incident to add them to our PSR and discuss our wider vulnerable customer programmes that might be available to them.

Question D3: How did you proactively engage with customers (by customer type) before, during and after the event?

128. Our Communication strategy for incidents puts emphasis on being proactive with our communications because we know our contact centres will always be busy during these periods, and customers prefer to hear directly from us rather than having to contact us.

129. We fully activated and carried out all our proactive communications processes during this incident, and mobilised our complete communication, customer contact and social media response team 24/7 throughout. We used a range of proactive channels to ensure that we could reach as many customers as possible. We found the use of proactive SMS messaging and social media to be particularly effective approaches, and we used them much more extensively than we have for previous incidents.

130. Our full communications response is detailed in section D1 and D2, but in summary our proactive response for customers included:

Proactive communications before the incident

131. We proactively issued two updates for customers before the incident. One on preparing for the cold weather and one asking customers to report leaks and how to do so. We issued this via our website, social media and a press release to all the media in our area. We also conducted media interviews to support the cold weather messaging.

Proactive communications during the incident

132. During the incident, we issued the following proactive communication to our customers:
    - **All customers:** 91 website updates, 45 proactive Twitter or Facebook updates, 110 media updates and 17 TV and radio interviews which helped to generate over 700 media updates for customers. We issued pictures and multi-media content via social

media and our website, and moved quickly to proactively announce our compensation arrangements early on Tuesday 6 March.

- **Residential customers:** regular SMS text and voicemail updates
- **Vulnerable and sensitive non-household customers:** Our customer service agents proactively called our PSR customers in the impacted areas and we liaised directly with hospitals, care homes, prisons, schools and farmers in the affected areas to offer a range of alternative supplies if they needed them.
- **Business customers and water retailers**: we posted updates on our Retailer portal and engaged directly with a handful large industrial users of water, such as Jaguar Land Rover and Cadburys, to suspend production for a short period enabling us to conserve water

Proactive communications after the incident

133. After the incident, we issue apology press releases and adverts, a customer survey, had Executives and senior managers visit customers and farmers in the Ashbourne area of Derbyshire; and we issued communications on our compensation information. We also conducted meetings with Derbyshire County Council, and are following up with all the schools we had contact with during the incident to offer them workshops or assemblies with our education team. We are also in the process of following up with any new vulnerable customers who contacted us during the incident.

Question D4: What processes do you have in place for managing properties that are vacant, void or difficult to access (e.g. businesses that are closed at weekends) in the event of a major incident?

134. As noted in section D2, we issued proactive information via a press release, website update and social media update asking customers to prepare for the cold weather. Within this, we provided advice for customers who might have been going away, asking them to take action now as the cold could and has led to pipes bursting and damaging homes. We suggested that they should consider turning off stop taps if they were going away from home and leaving their heating on low to prevent pipes freezing and bursting. We directed customers to some 'how to' videos at www.stwater.co.uk/winter.

135. As we noted in section C4 above, we have an established process for identifying and managing voids and vacants during an incident; it is built into our established triage system for managing and prioritising calls into our Operational Service centre. These cases are identified from one of two sources of information: 1) we run a report from our system of known vacant & void properties in the incident area and 2) we receive notification from members of the public / our field teams when they hear or see running water

136. Based on this intelligence we feed into our broader find & fix resource planning activities to allocate resource to find and isolate the water supply. During major incidents we also re-allocate our meter readers to finding and isolating these leaks and have a dedicated work stream

proactively looking for these cases. We implemented this during the incident and deployed resource to look at empty properties and commercial properties that were unoccupied due to the weather. More detail on our response is included in Section C.

Question D5: What ongoing support after the incidents have you put in place, in particular for customers in vulnerable circumstances?

137. Our on-going support is detailed in sections D1 and D2 above in the after the event sections. In summary, we conducted a customer survey and issued our customer satisfaction survey 'Pipe-up' to all potentially impacted customers after the incident and will feed the results of this into our future priorities. Our MD of Production and Head of Communications visited impacted customers and farmers to hear about their experiences in the Ashbourne area of Derbyshire so that these could be taken forward too.

Vulnerable customer support post the incident

138. We followed up with our vulnerable customers to ensure that they were back on supply and didn't need any further alternative supplies. We are also in the process of following up with any new vulnerable customers who contacted us during the incident to add them to our PSR and discuss our wider vulnerable customer programmes that might be available to them.

139. Our Manging Director of Production and Head of Government Affairs met with the Leader, Deputy Leader, Director of the Environment and Head of Civil Contingencies of Derbyshire County Council on Thursday, 29 March. We will following up with the council to compare vulnerable lists and ensure we have captured all of the vulnerable customers in the local area on our PSR list.

140. We are also following up with all the schools we had contact with during the incident to offer them workshops or assemblies with our education team.

E. Impact on customers and compensation arrangements

Ofwat: We want to understand how water companies expect to provide customers with appropriate compensation for the disruption that they experienced.

Question E1: Provide details of how you will identify which customers (by customer type) are entitled to compensation.

141. We have followed our well established process which starts by identifying which DMAs have experienced a loss of supply. We then assess the DMA using flow and pressure data which was collected during the incident to assess which properties were impacted and for how long.

142. Our loggers are positioned at high points in the network which means we start with a wide view of impacted customers and then look to understand what additional data is available e.g. customer call backs and spot pressures, to refine the extent and duration of the interruptions. The principle we work to is if we don't have robust data to confirm that a customer or group of customers were on supply we assume that they were without water and are therefore eligible for compensation.

143. For some of the areas we have used reservoir level data to model the extent of loss across the network and where the data allows we have also carried out drain down modelling which provides additional insight into extent and duration of the interruptions.

144. The outputs from the analysis have then been cross referenced with our property data from our core systems (Target, SAP, Netbase and GISST) to identify individual customers and the duration they were impacted. This has been carried out by a separate team who have also verified the outputs from the network analysis.

Question E2: Provide details of the automatic GSS payments, including any payment penalties, you expect to pay (or already have paid) to customers (by customer type) as a result of the incident period and the total value associated to these payments.

145. Customers who have been off supply for over 12 hours continually are eligible for our 'emergency supply interruption' GSS and receive a payment of £30 which is the equivalent of a month free on the average combined water and waste bill. We make further payments to customers who are still off supply 24 hours after the initial 12 hour trigger. These payments are £10 per 24 hours and are made automatically to customers as credits on their account.

146. Where a customer has been on and off supply a number of times and the cumulative time off supply exceeds 15 hours they are eligible for our 'repeat interruptions to supply' GSS and receive a payment of £30. Normally customers have to make a claim for this payment but for this incident we have chosen to proactively pay customers who meet the criteria for this payment and these payments have been made automatically as credits on their account.

147. The 15 hour intermittent payment recognises that a lengthy disruption does have an impact on a customer's ability to go about their normal life but also takes into account that customers have had supplies for periods of time. This 15 hour trigger therefore differentiates between the

impact of not having water continually versus having water for some of the time. We are not aware of any other water company that offers an intermittent service standard payment.

148. We had already started a review of whether our approach to GSS truly matches the impact having no water has on our customers, especially when they have been without water for a long period of time. This incident gave us the opportunity to reflect on this and as a result we have decided to make a permanent change to our Code of Practice and the payments made to customers who are impacted for a significant length of time. To reach this conclusion we reviewed feedback from customers from recent events which showed that customers feel that the equivalent of a month's free water (£30 payment) is appropriate recompense for the inconvenience of a 12 hour supply interruption and we have had a number of customers who have even questioned the need for any payment as they feel the provision of bottled water to cover immediate needs more than meets their expectations. We therefore felt the key focus of our changes should be on those customers who suffer the most through an extended period of interruption.

149. The changes we are making are;

- First additional payment is made at 24 hours rather than 36 hours to make it easier for customers to understand
- Additional payments for household customers have increased from £10 to £20 for 24-48 hours and £25 for any additional 24 hours
- Additional payments for non-household customers have increased from £25 to £50
- We have introduced additional payments where cumulative intermittent interruption exceeds 24 hours

150. These changes have been discussed with CCW who were fully supportive of our approach and the changes we are making. Our Code of Practice is being updated to reflect these new payments and timescales.

151. In total for this incident we have paid compensation to 8,819 customers totalling £587,160. This is split between 7,231 customers receiving payments under our 'emergency supply interruption' GSS and 1,588 customers receiving payments under our 'repeat interruptions to supply' GSS. The tables below show the breakdown of payments made for the two standards. Please note that the number of customers paid compensation for this incident (8,819) differs from the number of customers experiencing supply interruptions over 12 hours as per Data Table 2 (13,586). This is because the number from the Data Table 2 is for customers who had any form of interruption (intermittent or continuous) which went over 12 hours.

Table E1: >12 hour Emergency Supply Interruption GSS

1. Household customers receiving emergency supply interruption GSS payment

Customer Impact	Amount per customer (£)	Number of Customers	Amount paid (£)	Penalty payments (£)	Total paid (£)
>12 hours	30	2566	76,980	32,560	109,540
>24 hours	50	2593	129,650	25,650	155,300
>48 hours	75	1343	100,725	24,340	126,065

>72 hours	100	91	9,100	1,820	10,920
>96 hours	125	13	1,625	260	1,885

2. Non Household customers receiving emergency supply interruption (>12 hours) GSS payment

Customer Impact	Amount per customer (£)	Number of Customers	Amount paid (£)	Penalty payments (£)	Total paid (£)
>12 hours	50	191	9,550	9,050	18,600
>24 hours	100	199	19,900	4,950	24,850
>48 hours	150	101	15,150	5,050	20,200
>72 hours	200	134	26,800	6,700	33,500

Table E2: >15 hour Repeat Interruptions to Supply GSS

1. Household customer receiving repeat interruptions to supply GSS payment

Customer Impact	Amount per customer (£)	Number of Customers	Amount paid (£)	Penalty payments (£)	Total paid (£)
>15 hours	30	0			
>24 hours	50	1490	74,500	0	74,500
>48 hours	75	0			
>72 hours	100	3	300	0	300

2. Non Household customer receiving repeat interruptions to supply (>15 hour intermittent) GSS payment

Customer Impact	Amount per customer (£)	Number of Customers	Amount paid (£)	Penalty payments (£)	Total paid (£)
>15 hours	50	0			
>24 hours	100	74	7,400	0	7,400
>48 hours	150	6	900	0	900
>72 hours	200	0			
>96 hours	250	14	3,500	0	3,500
>312 hours	700	1	700	0	700

Question E3: Provide details of any further compensation you will be providing to customers beyond automatic GSS payments and how the level of compensation was calculated relative to the disruption customers experienced. In doing so please provide details of the numbers of customers (by customer type) you expect to receive this and the total value associated to these payments.

152. In our media statements during the incident we made it clear that we are always happy to discuss compensation claims from anyone who's been affected on a case by case basis.

153. Where a household customers contacts us to inform us they have incurred out of pocket expenses as a result of this incident e.g. purchase of bottled water, ready-made baby formula, we have provided reimbursement to them. In total we have made payments to 12 household customers totalling £398.

154. If a customer queries why they haven't been paid GSS we carry out some checks, if they have narrowly missed the criteria of 12 hours continuous interruption or 15 hours intermittent interruptions we will make a payment of £30 as a gesture of goodwill to them. So far we haven't received any queries relating to this.

[redacted]

Question E4: Provide details of how long you anticipate the process of compensating all affected customers will take and the methods by which the compensation will be paid (e.g automatic, cheque). Will there be an application process for any elements of compensation? If so, please describe the process.

156. We have paid all affected customers by 4 April. Household customers have received their compensation as a credit on their account. Non-household customer compensation has been sent to their Retailer. All customers have been sent a letter confirming that their compensation has been paid to them.

F. Reflection and lessons learned

Ofwat: We want to understand what lessons water companies will take on board from the events in terms of delivering greater resilience in the round for customers.

Question F1: Provide details of what you considered to work well and what you considered to need future improvement for your company and why in relation to…

157. We consider that the governance structure we have in place to manage different levels of incidents served us well in the case of this incident. There are a number of reflections and lessons learned from this incident, which we are already putting into action in advance of fully completing our own internal investigation of the issues. At the same time, a number of things worked well, in particular: our ability to find and fix leaks quickly; our overall communications (and social media in particular); and the effectiveness with which we mobilised and applied our overall incident response arrangements.

a) Identifying and repairing supply interruptions and actions taken to prepare the supply and network system;

158. Specific areas where we have already identified lessons learned, and are in the process of developing (or have developed) an action plan in relation to are:

    a. The more extensive deployment of **data loggers** throughout our distribution network. The scale of this event has highlighted that our current data logger deployment doesn't provide a sufficiently comprehensive view of pressure levels throughout our distribution system. This constrains the effectiveness with which we can identify the numbers of customers affected by supply problems both in real time and post incident, and period of time over which they are affected. We already have plans in place to invest in additional data loggers. This incident has served to further demonstrate the benefits of having more extensive pressure data across our network. This will enable us to assess the impact of any interruptions, bursts or significant demand increases on our customers' levels of service more rapidly and more accurately. We have already committed to a significant investment to install additional data loggers commencing this year.

    b. Our **Northfield** reservoir (which serves parts of Birmingham) ran empty during the freeze/thaw event following the considerable increase in demand that resulted from pipe bursts. Our existing resilience within the Birmingham area resulted in us maintaining supplies to around 55% of the customers served from this reservoir, with 97% of these customers' supplies restored in less than 12 hours. However Northfield running empty under this level of demand is a new failure mode we have not experienced before. We will review the operation of our Frankley Water Treatment Works (which feeds Northfield Reservoir) to identify what further opportunities exist to support the Northfield reservoir system.

c. Our comprehensive **Incident Management Plans** from our SIMRP down to operational incident plans contain core triggers for the instigation of pre-specified responses and governance escalation. These include triggers for sustained cold temperature periods, but we do not currently have triggers reflecting the risks associated with significant temperature differentials arising within a short time period (eg a rapid thaw). In partnership with the Met Office (or other similar bodies), we will identify and review options for putting in place formal triggers aimed at assisting with the management of temperature differential risks. We will assess ways in which this might enhance our incident management preparedness, and seek to develop, test and implement appropriate trigger arrangements.

d. **Breamfield Reservoir**, Derbyshire. This reservoir has two 12" feeds into it and was therefore thought to have sufficient resilience to an inlet pipe failure. In this incident one of the 12" inlet pipes burst. This had the unforeseen consequence that the pumps at the water treatment works failed. While partial supplies were restored within 6 hours this event highlights the need to ensure all the failure mechanisms for resilience are understood and mitigated. We will build this into our processes for identifying resilience and single points of failure and into our solution designs.

e. **Water into supply**. Our water into supply increased as the incident developed. Our priority is to ensure our distribution input matches the demands we predict on our network. Our peak distribution input (Table 1, line 8) was on the 6th March. As works outputs increase the full benefit is shown in the following days production figures, ie Mondays improvements will be shown in Tuesdays figures. Furthermore we experienced issues with increased raw water turbidity which impacted the rate at which works outputs could be increased. We will investigate options for more rapid increase in production over and above our predictions without compromising water quality.

f. **Airlocks** occur both in the water mains in our network and within customers premises. They result from air entering the system following reservoirs running empty or during burst pipe repairs. Air effectively becomes trapped at high points in our network. We were monitoring reservoir levels as supplies were restored which reassured us that customers would be back on supply. However due to the weather impacts on mobility and access to our valves and hydrants it took longer to remove the air from our network than it would under normal weather conditions. We will review our operational processes to identify what more we could do to improve this aspect of our operation during extreme weather events. This may include industry benchmarking to identify best practice.

g. We are taking actions to allow us to make better use of **local resilience forums**. Our review work so far has highlighted the benefits from engaging effectively with LRFs from the early of an incident, as we did, for example in Birmingham and Warwickshire. In those areas, we worked effectively together with LRFs in providing community support, information to customers, and agreeing alternative supply locations to minimise community impact. Joint ownership of decision making reduced conflicts, allowed for the provision of plant and equipment to support our increased operations, and provided additional planning time

for other key stakeholders (including councils, highway authorities etc.). This helped reduce further community impacts such as traffic disruption. We could have engaged more effectively with the LRF in Derbyshire, where closer liaison may have proven to be useful in relation to clearing roads. This may have reduced the time it took us to access our assets (for example, in order to clear airlocks), and could have facilitated the more rapid restoring of supplies in some rural areas. James Jesic (Director of Production) and Andrew Fairburn (Head of Government Affairs) met with the Leader, Deputy Leader, Director of the Environment and Head of Civil Contingencies of Derbyshire County Council on Thursday, 29 March to review how we can better work together in the future. Some specific areas of improvement from this meeting that we will seek to include in our planning are:

- Early engagement and keeping them informed regularly, and accessing their support to communicate with other stakeholders, care homes, schools etc. directly on our behalf.
- The provision of accurate assessments of when problems will be resolved, without over-promising in the face of uncertainty.
- Understanding the community impact of an incident more rapidly through engagement with the LRF in order to allow a more rapid and effective response that meets the needs of the community.
- Ensuring we adequately support all members of the community, in particular the farming community in rural Derbyshire.

b) Communicating activities to customers/stakeholders (by customer/stakeholder type)

159. The scale and impact of leakage as a result of **burst pipes on customer properties** was a key feature of the freeze/thaw incidents, and was a major driver of the supply pressures that we experienced across our network (and experienced particularly acutely in some areas). While a high proportion of these losses reduced within the first 24 hours of the incident (as customers took action to address the resulting leaks), the scale of the associated leakage had the effect of heavily depleting available stores in some areas, and made supplies more vulnerable to subsequent problems arising. We plan to review experience from this event alongside our current review of our Burst on Private Pipes Policy which will involve benchmarking to understand what we can learn from our peers across the industry. We will seek to identify how we might better inform our customers of how they can protect their pipes from freeze/thaw incidents and the reasons for doing so. This will include considering how we could work better with customers, plumbers and home protection services, such as HomeServe, to expedite the fixing of bursts on customer pipes so as to help ensure the availability of supplies across the broader network. We will seek to review this in collaboration with Water UK. For non-household customers this event has highlighted the importance of working closely with Retailers to ensure their customers are similarly informed and prepared for similar incidents.

160. Our social media engagement proved a highly effective means of communicating with our customers. Mobilising enhanced social media teams 24/7 ensured we could interact with customers in real time across the whole of the incident. This was valued by our customers with over 80% of these interactions and comments on social media being either positive or neutral in tone.

161. While recognising the benefits that social media can provide, our communications strategy also recognised the importance of not relying too heavily on the internet so we also utilised a wide variety of channels to provide regular updates to all our customers including direct SMS text and voicemail messages to their phones and mass media including radio, TV, social media or print. We will however be working with Derbyshire LRF and others to look at how we keep more rural communities updated during any future incidents and will share and apply these learnings more broadly across our region. We will also be developing more robust processes with retailers to ensure that business customers are kept fully updated and we will specifically be looking at how we enhance our communication with our sensitive non-household customers, specifically farmers and schools. We will also be assessing what further communication we can do in the run up to any other future cold spells to encourage more customers to take action, and we will be retraining our teams on the processes to increase the capacity of our website during incidents.

c) Identifying and supporting the needs of customers in vulnerable circumstances

162. During the incident we were able to contact and provide support through continual door step deliveries to all vulnerable customers who were already on our Priority Services Register (PSR) or who we were made aware of during the event. We do recognise that maintaining an up to date list of customers in vulnerable circumstances needs to be an ongoing exercise and we will continue to work with LRFs and local councils to ensure we have captured all the vulnerable customers in a local area on our PSR. We will also review whether there are any other organisations e.g. local charities, who we could work with to ensure we have captured all vulnerable customers in our area and how we can better promote our PSR through our own communication channels.

d) Having the appropriate governance processes in place.

163. Our incident management procedures at Operational, Tactical and Strategic level are well rehearsed and worked well. Weather forecast triggers meant that preparatory work to manage the impacts of cold weather began in advance and there was clear, appropriate escalation through the incident. Our incident management teams mobilised rapidly and effectively once the Tactical, then Strategic incident levels had been triggered.

164. Our governance processes worked in line with our planned procedures and all workstreams were well resourced and well managed. We had clear separation of the Strategic, Tactical and Operational teams, implemented the appropriate support structures and saw good incident management behaviours, in accordance with documented processes and the training

expectations. As a consequence, the incident accountabilities, responsibilities and coordination were clear and effective.

165. The initial conclusions are therefore that the overall governance and incident management processes are fit for purpose.

166. We already have a continuous improvement programme underway for incident management that contains issues identified during previous incidents and exercises. The feedback from this incident will be checked against already identified focus areas to validate the programme priorities.

Question F2: What were the biggest constraints to your company doing more, faster to respond to issues customers faced?

167. The main constraint on response capabilities during the incident was the weather. There were extended periods of severe weather with multiple snowfall events, resulting in prolonged significant drifts, as the photographs in Appendix L1 highlight. This had two impacts on our ability to respond. Firstly, in the rural areas of Derbyshire and Leicestershire roads were severely affected and compromised the speed of our responses. Secondly, this was compounded by deep snow, including the effects of snow ploughs making it very difficult to access valves and hydrants which were essential for leak detection and repair, and for clearing air from the network.

168. In practice, though, the most significant constraint on our ability to do more, faster to respond to issues customers faced came from the sheer volume of the losses of water that were resulting from customer pipe bursts. The scale of the resulting increase in demand was such as to generate significant supply pressures, but the speed with which those pressures were ameliorated was heavily dependent on the actions of our customers, and of plumbers and insurance companies acting on their behalf. The incident highlighted the extent to which the resilience of the supply system relies on effective responses to customer pipe bursts, and this raises some broader questions over the appropriateness of the current allocation of risks and responsibilities concerning customer pipes.

169. We have good monitoring of our network including DMA flow and pressure data, Distribution Service Reservoir water levels and source works outputs. This event has confirmed that more real time data from our network would allow us to have rapid insight into emerging issues and enable an even quicker response. F1 160(a) sets out our plans to invest in the infrastructure required to enable this.

170. We have made substantial investments in our network to improve resilience. In particular we have identified and resolved many single points of failure. Our draft plans for PR19 include further work to improve resilience with particular focus on the East Midlands (Leicestershire, Nottinghamshire and Derbyshire). This event has reinforced the need for constant scrutiny of our operations to identify single points of failure and where appropriate take action to resolve.

Appendices – attached separately

Appendix L1 – Photographs of weather conditions

Appendix B1 – Strategic Incident Management Plan and Wholesale Incident Management Pack

Appendix C1 – Nottinghamshire Leakage Winter Plan 2015

Appendix D1 – Examples of customer communications