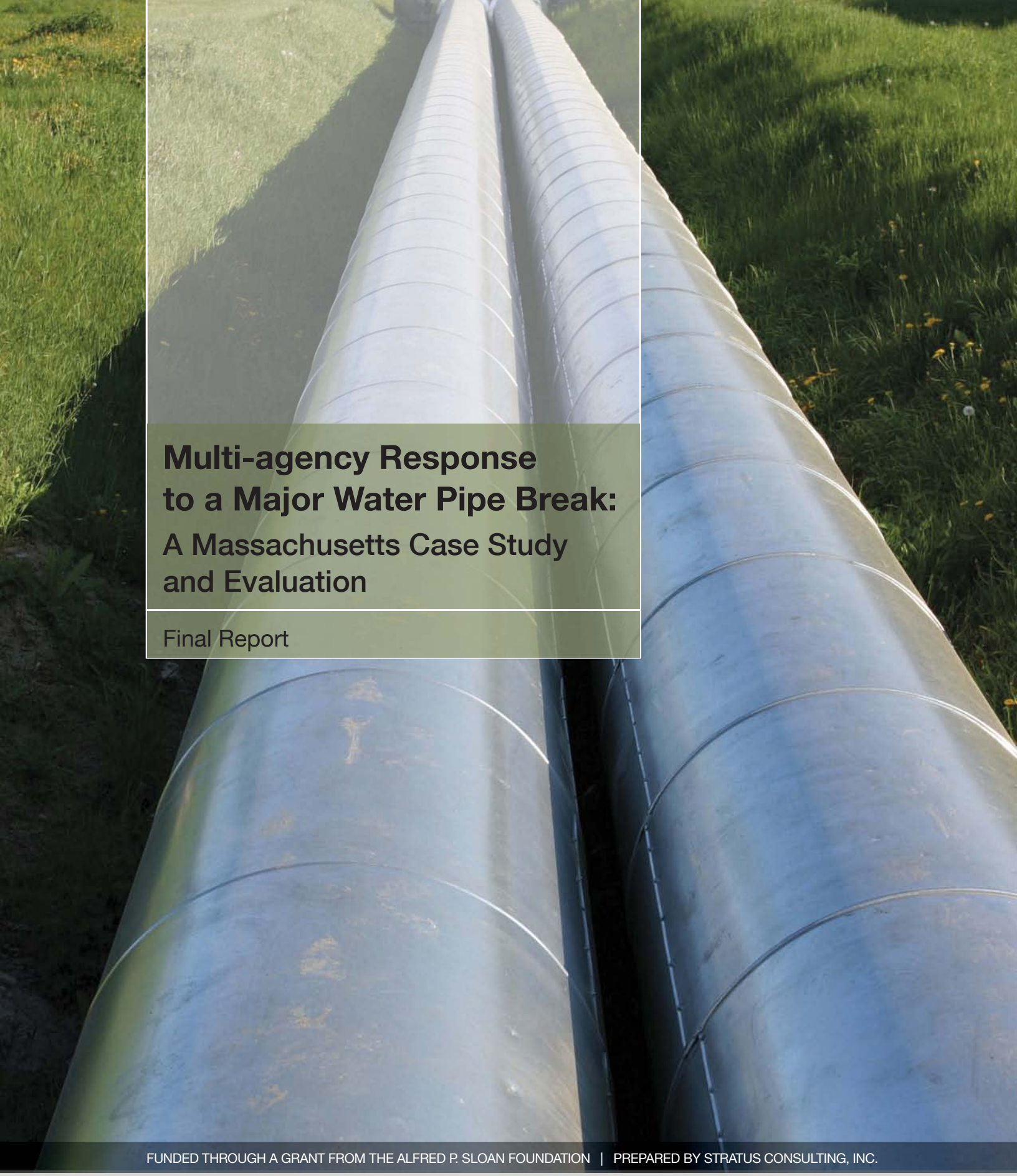

Multi-agency Response to a Major Water Pipe Break:

A Massachusetts Case Study and Evaluation

Final Report

FUNDED THROUGH A GRANT FROM THE ALFRED P. SLOAN FOUNDATION | PREPARED BY STRATUS CONSULTING, INC.

PREPARED FOR:

ASSOCIATION OF METROPOLITAN WATER AGENCIES

WATER RESEARCH FOUNDATION

WaterISAC
Water Security Network

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Prepared for:

Association of Metropolitan Water Agencies
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Prepared by:

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March 31, 2011

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List of Acronyms and Abbreviations Used in this Report

Acronyms and Abbreviations Used in this Report

AwwaRF	American Water Works Association Research Foundation
BPHC	Boston Public Health Commission
BWSC	Boston Water and Sewer Commission
CWTP	Carroll Water Treatment Plant
DEP	Massachusetts Department of Environmental Protection
DOT	Massachusetts Department of Transportation
EAP	Emergency Action Plan
E. coli	*Escherichia coli*
EOC	Emergency Operations Center
EOEEA	Massachusetts Executive Office of Energy and Environmental Affairs
EPA	United States Environmental Protection Agency
ERP	Emergency Response Plan
FAQs	Frequently Asked Questions
FEMA	Federal Emergency Management Agency
ICS	Incident Command System
MDPH	Massachusetts Department of Public Health
MEMA	Massachusetts Emergency Management Agency
MWRA	Massachusetts Water Resources Authority
OEP	MWRA Office of Emergency Preparedness
UASI	Urban Areas Security Initiative
WASM	Weston Aqueduct Supply Mains
WaterRF	Water Research Foundation

Executive Summary

S. Executive Summary

The Massachusetts Water Resources Authority (MWRA) was established in 1984 to provide wholesale water and sewer services to 2.5 million people and more than 5,500 large industrial users in 61 metropolitan Boston communities. MWRA provides drinking water to residents living in 51 of these communities.

At about 9:30 a.m. on Saturday, May 1, 2010, a 10-foot-diameter coupling, which holds segments of pipe together, broke loose near Shaft 5A of the MetroWest Water Supply Tunnel, a primary component of the MWRA system. Millions of gallons of water were released, and the subsequent MWRA actions required to maintain water supply and repair the pipe damage affected the drinking water supply to the City of Boston and 29 other communities in the metropolitan area. To maintain water delivery, MWRA reconfigured parts of the transmission system and switched to a combination of fully treated and chlorinated backup water supplies. Massachusetts Governor Deval Patrick declared a state of emergency and issued a boil water order for the affected communities.

Despite the magnitude of the situation, MWRA repaired the broken pipe and restored full flow in less than two days. By 7:00 a.m. on Tuesday, May 4, the boil water order had been lifted for all 30 communities affected by the break.

S.1 Purpose and Objectives

Water utilities are required to complete a vulnerability assessment and Emergency Response Plan (ERP) under the Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act, 2002). Nevertheless, utilities approach emergency planning and preparedness with varying levels of rigor, and some utilities have never needed to activate their emergency response systems. The MWRA Shaft 5A pipe break provides a window of opportunity to characterize and assess the effectiveness of a major utility's emergency response program based on its response to a significant emergency event.

Funded through a grant from the Alfred P. Sloan Foundation, the Association of Metropolitan Water Agencies commissioned Stratus Consulting to conduct a comprehensive review and develop a case study of the response to the Shaft 5A break undertaken by MWRA and other state and local agencies, including the offices of the Governor of Massachusetts and the Mayor of Boston. This case study presents an example of the drinking water emergency response process and analyzes the challenges, successes, and lessons learned related to this process. It identifies areas that MWRA and the other state and local responders conducted successfully as well as areas where the responders encountered challenges. The purpose of this report is to present a

case study that provides an opportunity for drinking water and wastewater utilities to better understand how to achieve a successful response to a significant emergency event.

S.2 Approach

The Stratus Consulting research team adopted a multi-step approach for developing this case study, which incorporates assessment and analysis of the actions of MWRA and other state and local responders involved in the incident. This approach involved the following steps:

- *Archival and Document Review***.** Stratus Consulting reviewed written documentation about the circumstances of the Shaft 5A pipe break and subsequent emergency response activities.

- *Media Content Analysis*. The research team collected published media accounts of the event, including print, video, and web-based media sources. The team reviewed content and characterized the stories according to the key topics covered.

- *Interviews*. The core of the case study analysis is based on findings from face-to-face and telephone interviews with 28 decision-makers, emergency responders, and media representatives associated with the response to the Shaft 5A incident.

- *Integration and Analysis*. Research inputs from the archival and document review, media content analysis, and interviews were consolidated and evaluated in terms of a 12-step model of emergency response in the water sector (see Exhibit S.1). This report describes what should be accomplished during each activity, thus providing criteria with which to compare Shaft 5A events. Stratus Consulting analyzed the emergency response to the Shaft 5A event for each of the 12 identified response categories and developed overall findings and lessons learned. In addition, MWRA's emergency preparedness and planning materials were compared against guidance published by the Massachusetts Department of Environmental Protection.

Exhibit S.1. 12-step emergency response framework for assessing Shaft 5A response

- Recognize status changes
- Mobilize staff
- Activate external communications
- Analyze type and severity of event
- Develop specific response/recovery actions
- Assess/address health and safety threats
- Preserve stored water/identify alternative water sources
- Perform emergency repairs based on priority of demand
- Return system to normal levels
- Evaluate response and plan
- Revise plan
- Conduct ongoing training/security acculturation

Source: AwwaRF, 2006.

- *Review and Convergence*. Two draft reports were developed prior to this final version. The drafts were reviewed by independent peer reviewers and several of the agencies interviewed for this case study. This final case study incorporates comments, clarifications, and new information from this review process.

S.3 Conclusions

The Shaft 5A pipe break provides an excellent opportunity to examine the factors that comprise a successful response to a potentially major disruption in drinking water service for a large metropolitan area. MWRA and its response partners executed the emergency response professionally, efficiently, and effectively, and interviews with members of responding agencies and organizations and media content analysis show a high level of satisfaction with the response. Nevertheless, this case study identified both best practices and challenges.

The following three findings are particularly important for ensuring an effective emergency response:

1. *Develop a "Security Culture."* The Shaft 5A response underscores the importance of thorough emergency planning and preparedness, and illustrates the critical need for drinking and wastewater utilities to engage in mindful and active emergency preparedness programs. MWRA and several of the other responding agencies have well-established security cultures, and this emphasis on emergency response planning and training is one of the fundamental reasons for the success of the Shaft 5A response. This security-focused outlook can be maintained and bolstered through a variety of practices illustrated in this case study: (1) conduct emergency response planning; (2) emphasize drills and training; (3) treat normal incidents as drills; (4) learn the ERP, but also emphasize the importance of mindful response improvisation; and (5) review and revise the ERP, incident command structure, and associated emergency protocols after every emergency event.

2. *Nurture Relationships Before an Event, Not Just During an Event.* Another critical reason for success illustrated by this case study was that the response was facilitated by substantial cooperation and coordination among a wide range of emergency responders. This focus on collaboration was exhibited both within MWRA and at the interagency scale. Colleagues in different agencies and departments already knew and trusted each other, had participated in drills together, collaborated with each other during other emergency and non-emergency events, and knew what to expect from one another. Thanks in part to the involvement of the Massachusetts Governor and the Mayor of Boston, the various state and local agencies moved easily into designated roles and maintained effective communication among all the players. The Shaft 5A event provides

a model for other utilities on how to nurture interagency relationships through developing trust, mutual respect, and knowledge of one another's systems, capabilities, and communications practices.

3. *Develop a Strong Emergency Operations Center/Incident Command.* Key response team members involved in the Shaft 5A incident met soon after the break was discovered and implemented a command structure where the Massachusetts Governor was in charge of state operations, the Boston Mayor was in charge of the city's operations, MWRA's Executive Director was in charge of coordinating the Authority's operations with the state, and the MWRA Chief Operating Officer was the Incident Commander for MWRA. The greater Boston emergency response structure enjoys many positive characteristics, including, as described above, (1) strong security cultures within agencies, (2) well-trained staff, and (3) excellent interagency relationships. These traits, combined with this effective command structure enabled the region to deal successfully with the Shaft 5A emergency. Water utilities should articulate and implement a coordinated, prearranged command structure for a successful emergency response. This should entail utilization of an Incident Command System (ICS) approach such as the Federal Emergency Management Agency ICS and development of an explicit and robust system of emergency command (including succession of authority and responsibility), control, and communication, including designation of a Public Information Officer who is in charge of coordinating all external communications.

Additional lessons learned that water utilities and other emergency responders should review to enhance emergency planning and response include the following:

Emergency Planning and Preparedness

- When assessing a recent emergency response, identify how the incident might have been handled differently if events had unfolded differently. For example, how would the incident command structure have been different if key staff were unavailable? What if the failure had been more severe? What if key repair components were unavailable? These questions can provide scenarios for future training sessions.

- An emergency response is only as good as its weakest link. When developing planning materials and conducting drills, be sure to include all actors in the response system and include them during drills.

Emergency Response

- Engage in the practice of "pulsing" – getting small bytes of initial information out the door quickly – during both routine and emergency situations.

- Ensure that a sufficient number of support staff is brought in during an emergency response and directed to help with handling housekeeping and administrative functions, thus enabling senior management and/or technical staff to focus on the response.

- The need for responder rest and stress management is well documented in emergency response and should be addressed during emergency planning protocols, training, and drills.

Organizational Issues

- Balance the importance of emergency plans, procedures, and command structures with the need for improvisation and mission flexibility.

- Assess existing emergency water distribution protocols. Although this might appear to be a straightforward issue, a variety of problems can arise, including procuring sufficient bottled and bulk water supplies (especially on weekends), hoarding water, and ensuring access to disadvantaged populations.

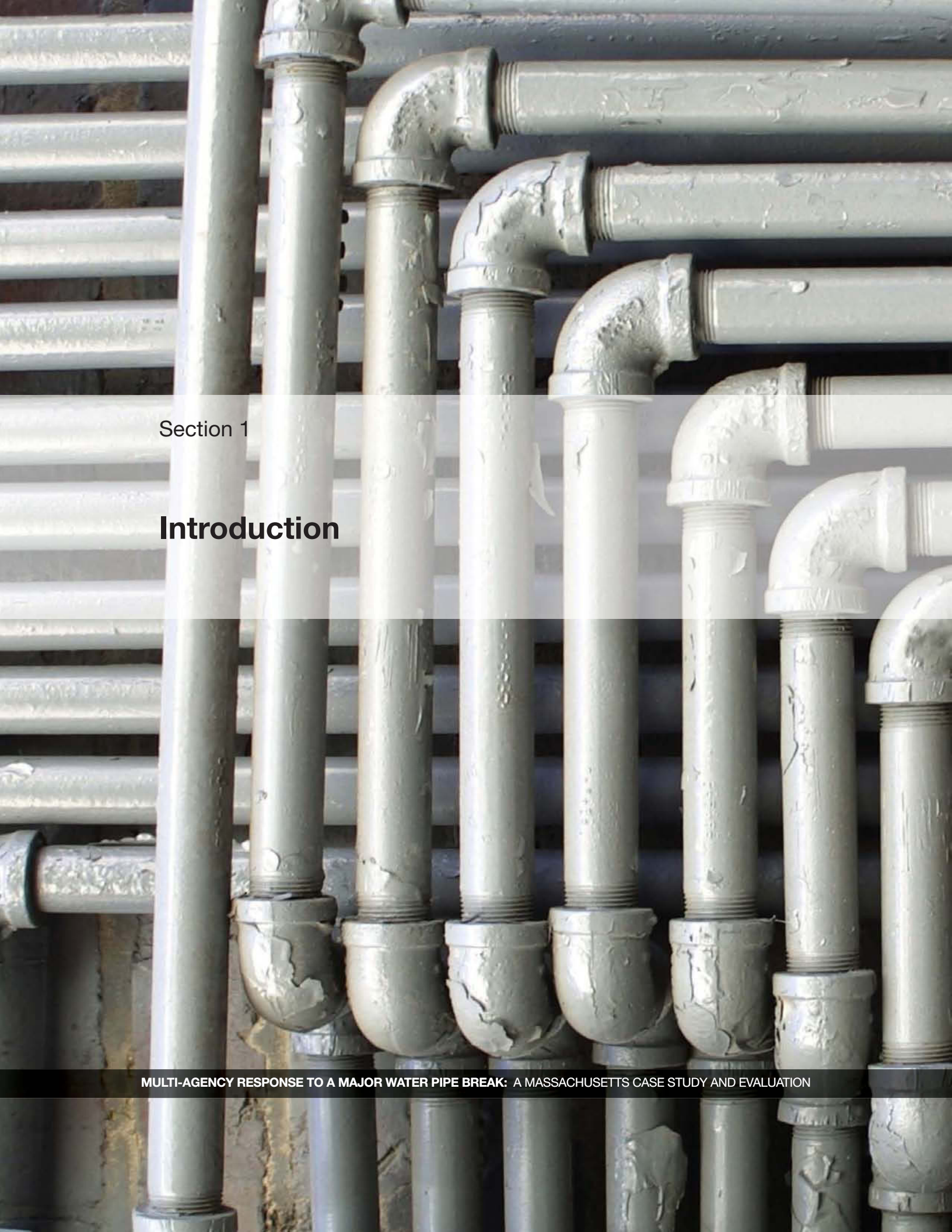
- Strong leadership can be critical. The Shaft 5A incident provides a valuable model for the successful involvement of strong, hands-on leadership.

Communication Practices

- Adopt a philosophy of transparency and frequent and varied communication. In many ways, the high degree of response transparency practiced by MWRA during the Shaft 5A incident enabled the media to become a literal partner in the emergency response.

- Electronic communication is essential, but its use creates a new set of issues and problems. It can be difficult and time-consuming to maintain contact information (e.g., email addresses and cell phone numbers). It is also important to develop strategies for using non-cellular capabilities and protocols.

- Develop a wide variety of notification templates (e.g., related to different types of emergencies, affected groups, and scale of events) in advance. Even with pre-existing language and community advisory templates, MWRA and its partners found that drafting event-specific language was a time-consuming challenge.



Section 1

Introduction

1. Introduction

The Massachusetts Water Resources Authority (MWRA) is a public authority established in 1984 to provide wholesale water and sewer services to 2.5 million people and more than 5,500 large industrial users in 61 metropolitan Boston communities. MWRA operates more than 400 miles of pipe that provides drinking water to residents living in 51 of these 61 communities. A primary component in the system is the MetroWest Water Supply Tunnel (MetroWest Tunnel). This 17.6-mile section of pipe began operating in 2003. It is designed to be the second main pipe in a dual system – paralleling the older Hultman Aqueduct, which was completed in 1940 and had previously been the primary MWRA water supply conduit.

On the morning of May 1, 2010, a coupling that secured segments of a 10-foot diameter surface pipe connecting two major supply tunnels failed. The break occurred near Shaft 5A of the MetroWest Tunnel, located in Weston, Massachusetts. The result was a water pipe break that released millions of gallons of water from the system and affected the drinking water supply to the City of Boston and 29 other communities in the metropolitan area. At the time of the break, the parallel Hultman Aqueduct was shut down for major rehabilitation work and could not provide immediate backup. To maintain water delivery for nearly two million people, MWRA reconfigured parts of the transmission system and switched to emergency backup water supplies. Massachusetts Governor Deval Patrick declared a state of emergency and issued a boil water order for Boston and the other affected communities.

Despite the magnitude of the situation, MWRA repaired the broken pipe and restored full flow in less than two days. By 7:00 a.m. on Tuesday, May 4, the boil water order had been lifted for all 30 communities affected by the break.

This report presents a case study of the response to the Shaft 5A break undertaken by MWRA and other state and local agencies, including the offices of the Governor of Massachusetts and the Mayor of Boston. This case study presents a real-life example of a drinking water emergency response process and analyzes the challenges, successes, and lessons learned related to this process. It underscores the importance of emergency planning and preparedness and illustrates the critical need for drinking and wastewater utilities to develop and engage in mindful and active emergency preparedness programs.

1.1 Case Study Objectives and Purpose

Water utilities are required to complete a vulnerability assessment and Emergency Response Plan (ERP) under the Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act, 2002). Most large metropolitan water utilities maintain active emergency

response programs to train and prepare for emergency scenarios in addition to maintaining their ERP. These programs typically include written ERPs, vulnerability assessments, event-specific and/or facility-specific response protocols, training programs, drills, staff certification programs, and redundant systems and backup supplies. Nevertheless, different utilities approach emergency planning and preparedness with varying levels of rigor. In addition, in many cases, utilities have never actuated their emergency response systems and consequently lack a first-hand understanding of how well their systems work.

Funded through a generous grant from the Alfred P. Sloan Foundation, the Association of Metropolitan Water Agencies commissioned Stratus Consulting to conduct a comprehensive review and develop a case study of the MWRA pipe break.

The MWRA pipe break provides a window of opportunity to characterize and assess the effectiveness of a major utility ERP and ongoing emergency response program based on a response to a significant emergency event. This case study focuses on the following questions:

- What actions did the MWRA and other state and local organizations undertake in response to the Shaft 5A water pipe break?
- Were response actions generally in line with those stipulated under MWRA's ERP?
- Did prior training exercises and drills provide relevant experience for subsequent events?
- Did the overall response meet the goals, objectives, and outcomes articulated in the ERP?
- What challenges were faced during the response and how were they addressed?
- What were the key successes and what contributed to these successes?

These questions were evaluated to meet the overall objectives of this case study – to provide drinking water and wastewater utilities with a well-documented example of a response to a significant drinking water emergency and to clearly articulate challenges, concerns, successes, lessons learned, and best practices derived from this event. This case study does not address the cause of the break or the activities associated with efforts to locate the missing coupling.

1.2 Research Approach

The Stratus Consulting research team adopted a multi-step, ensemble approach for developing the case study. This approach included an archival and document review, a media content analysis, and close to 30 face-to-face and telephone interviews with representatives of more than 10 state and local agencies and organizations involved in the response to the Shaft 5A water pipe break. Although the primary focus was on the actions undertaken by the MWRA, the pipe break

involved a wide range of emergency responders from a diverse group of state and local organizations. Consequently, the approach also incorporated an assessment and analysis of their actions. Taken together, this variety of sources and approaches enabled Stratus Consulting to conduct an integrated analysis of response actions to the pipe break, thereby ensuring a careful, rigorous depiction of the state and local response to the pipe break and the lessons learned from this event.

Archival and Document Review. The first step involved collecting written information documenting MWRA's existing ERP and Emergency Action Plans (EAPs), the circumstances of the pipe break, and subsequent emergency response activities. The research team identified and critically reviewed documents (e.g., emergency planning directives, guidance documents to consumers), situational reports, ERPs and protocols, and other written records that provide an underpinning for event characterization, response progression, and decision actions. This task involved reviewing the MWRA website, websites of the 30 affected communities, and websites for state and local agencies involved in the emergency response. An Internet search was also conducted to identify additional relevant documents. The information collected during this task provided the basis for developing a timeline and decision schematic to depict the activities conducted during the multi-agency, three-day response to the pipe break. The archival and document review was also used to help develop interview questions with key emergency responders and to provide a context for a critical assessment of the interviewees' answers.

Media Content Analysis. The research team conducted a broad-based review of published media accounts from the event. This included print, video, and web-based media sources. Close to 600 individual media stories were identified from 48 print and Internet-based news sources representing the 30 affected communities. The team reviewed the content of these stories and characterized the stories according to the key topics covered. These media accounts were used as an independent source of assessment with regard to event characterization, timelines, issues of concern, and other matters of perception or fact.

Interviews. The core of the case study analysis is based on findings from semi-structured interviews with 28 decision-makers, emergency responders, and media representatives associated with MWRA and other agencies that played a role in the response to the pipe break. The interviewee list was compiled based on review of the archival reports, media accounts of the event, and recommendations by MWRA staff. Both face-to-face meetings and telephone interviews were conducted. An MWRA employee attended all interviews with MWRA staff as well as with the staff of several other state and local agencies.

Exhibit 1.1 lists the agencies and organizations represented by the people interviewed for this study. A complete list of respondents is provided in Appendix A.

An interview guide was developed based on the archival review findings, the team's experience in water utility emergency planning, and an initial conversation with MWRA staff about the event. The interview guide was organized according to key areas of emergency response (e.g., initial response actions, operational response actions, internal and external communication, ensuring water quality, and pipe repair). The interviews included a mix of process/role questions (e.g., what the subject did during the response) and evaluative questions. The evaluative questions elicited the respondent's view on how well different response actions were handled, how things might have gone better, and the most important aspects of the overall response.

Exhibit 1.1. Massachusetts state and local agencies and organizations represented by interview respondents

- MWRA (multiple departments)
- Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA)
- Massachusetts Department of Environmental Protection (DEP), Drinking Water Program
- Massachusetts Department of Public Health (MDPH), Bureau of Environmental Health
- Massachusetts Emergency Management Agency (MEMA)
- Boston Environmental and Energy Services
- Boston Public Health Commission (BPHC)
- Boston Emergency Preparedness Office
- Boston Mayor's Office Hotline
- Town of Winchester, Department of Public Works
- Town of Arlington, Department of Public Works
- Boston Globe

During each interview, questions were selected as appropriate to the respondent's role in the emergency response, and answers were recorded on preformatted interview guides to enhance review and analysis. A short list of the key questions asked of every respondent is presented in Exhibit 1.2. A copy of the complete interview questionnaire is provided in Appendix B.

Integration and Analysis. Research inputs were consolidated and evaluated in terms of a 12-step model of emergency response in the water sector. Published by the Water Research Foundation (WaterRF) in 2006, this framework partitions emergency response in terms of a sequence of 12 activities that are typical of the water sector. Each of the activity categories includes a description of what should be accomplished during this phase of a response, thus providing criteria with which to compare Shaft 5A events. In addition, MWRA's emergency preparedness and planning materials were compared against guidance published by the DEP. Finally, research outputs were subjected to narrative content analysis in an effort to synthesize key findings and lessons learned.

Review and Convergence. An initial draft report was submitted to three independent peer reviewers and three of the agencies interviewed for the case study (MWRA, DEP, and MDPH). In some cases, the comments we received led to additional conversations, clarifications, and new information for the case study. Stratus Consulting made revisions to the initial draft report based on these comments and additional information, and submitted a second draft for final review. This final report incorporates comments from the second review process.

1.3 Summary of Report Contents

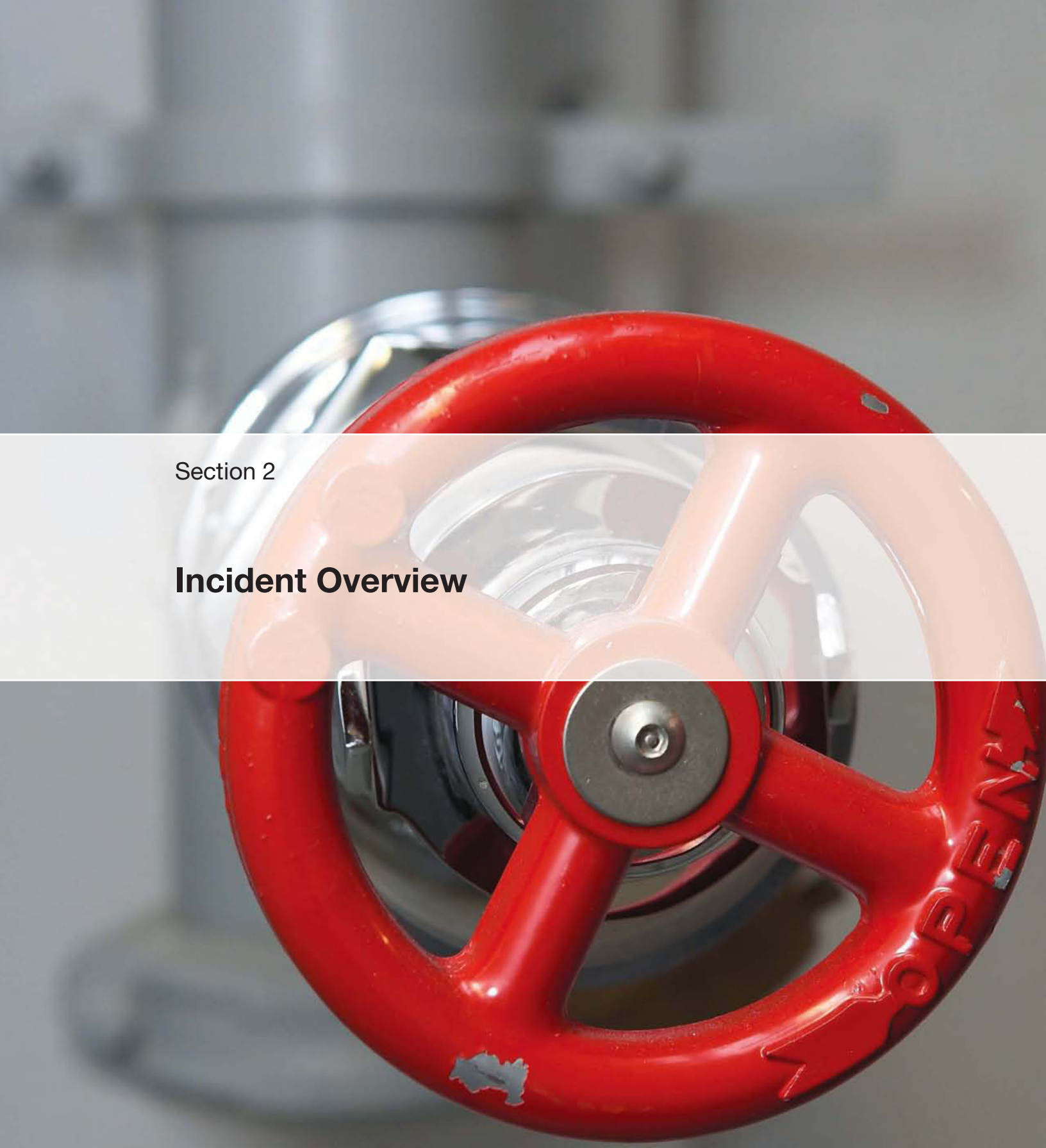
The remainder of this case study is organized as follows:

- *Section 2, Incident Overview,* provides a narrative description of the response to the Shaft 5A pipe break. It provides an event timeline and summarizes key decisions made during the response and the roles and responsibilities of MWRA and other state and local response agencies.
- *Section 3, Evaluation of the Shaft 5A Break Incident,* presents the analytical framework used for this case study and characterizes and assesses the emergency response to the Shaft 5A break based on this framework.
- *Section 4, Case Study Conclusions,* describes lessons learned, themes, and observations synthesized from the evaluation of the response by MWRA and other response agencies to the Shaft 5A pipe break. These findings are organized in terms of four topical areas: emergency planning and preparedness, emergency response, organizational issues, and communication practices.
- *Appendices*
  - Appendix A: In-Person and Telephone Survey Respondents
  - Appendix B: Massachusetts Water Resources Authority Shaft 5A Pipe Break Interview Guide
  - Appendix C: Sample Guidance, Notices, and Other Documents

Exhibit 1.2. Key interview questions regarding MWRA pipe break

1. In just a couple of sentences, what was the overall role of your organization in the MWRA Shaft 5A pipe break?
2. In just a couple of sentences, what was your overall role in the incident?
3. Who did you report to during the event?
4. Who did you give directions to during the event?
5. Were you or your agency involved in making key decisions necessary to the emergency response? If so, what were they?
6. During the initial hours of the pipe break on Saturday, May 1:
   - How did you (and/or your organization) learn of the break?
   - When did you learn of it?
   - What initial response actions did you (and/or your organization) take?
   - What problems, if any, did you encounter during these initial response actions? How did you address these concerns?
   - Which response actions went smoothly? Why?
7. Please describe the emergency response actions that you (and/or your organization) took over the four-day course of the pipe break event.
   - What actions did you take and when?
   - What other organizations/agencies did you work with?
   - What problems, if any, did you encounter during these initial response actions? How did you address these concerns?
   - Which response actions went smoothly? Why?
8. Does your agency have an ERP that covers your role in this type of emergency? If so, what does it include?
9. Overall, what were your two or three biggest challenges during the emergency response process? Why? How did you overcome or attempt to overcome them?
10. Overall, what do you think were the main elements of success? Why?

- Appendix D: General Resources
- Appendix E: Media Sources
- Appendix F: Community Resources.



Section 2

Incident Overview

2. Incident Overview

This section describes the key events, actions, and decisions made during the response to the Shaft 5A break. Section 2.1 presents a brief description of the incident and response. Section 2.2 summarizes the incident in terms of the roles and responsibilities of key responders, including MWRA, the Massachusetts Governor's office, the City of Boston, and other involved state and local agencies and organizations. It also describes the decisions made by these groups that were key to ensuring a quick recovery without loss of water services. As described above, the incident overview and related analysis do not address the cause of the break or the activities associated with efforts to locate the missing coupling.

2.1 Incident and Response

MWRA operates more than 400 miles of pipe that serve 85% of Boston area residents with drinking water. A primary component in the system is the MetroWest Tunnel, connecting the Carroll Water Treatment Plant (CWTP) with most of the service area. This 17.6-mile tunnel, which began operating in 2003, is designed to parallel the older Hultman Aqueduct, a surface aqueduct, that was completed in 1940.

On May 1, 2010, a 10-foot-diameter coupling, which held segments of surface pipe together, failed. The surface piping connected the end of the MetroWest Tunnel, called Shaft 5A, with the beginning of the City Tunnel, called Shaft 5. The break occurred in Weston, Massachusetts, near the Charles River. This incident marked the beginning of a three-day event that ended on the morning of Tuesday, May 4, when a boil water order for the greater Boston community was lifted. Exhibit 2.1 presents a timeline of the event. Exhibit 2.2 shows the configuration of the MetroWest Tunnel, and Exhibit 2.3 provides maps of the location of the break.

2.1.1 Recognition and Characterization of the Incident

At 9:49 a.m. on Saturday, May 1, 2010, MWRA staff received a "loss of communication" alarm from Shaft 5A. Soon after receiving the alarm, a security camera showed water being discharged in the vicinity of Shaft 5A, with a major eruption of water. Within the space of about one minute, the amount of water flowing through the MetroWest Tunnel increased from about 250 to 450 million gallons per day, releasing eight million gallons of water per hour into the Charles River. Workers immediately called in senior staff to respond to the emergency.

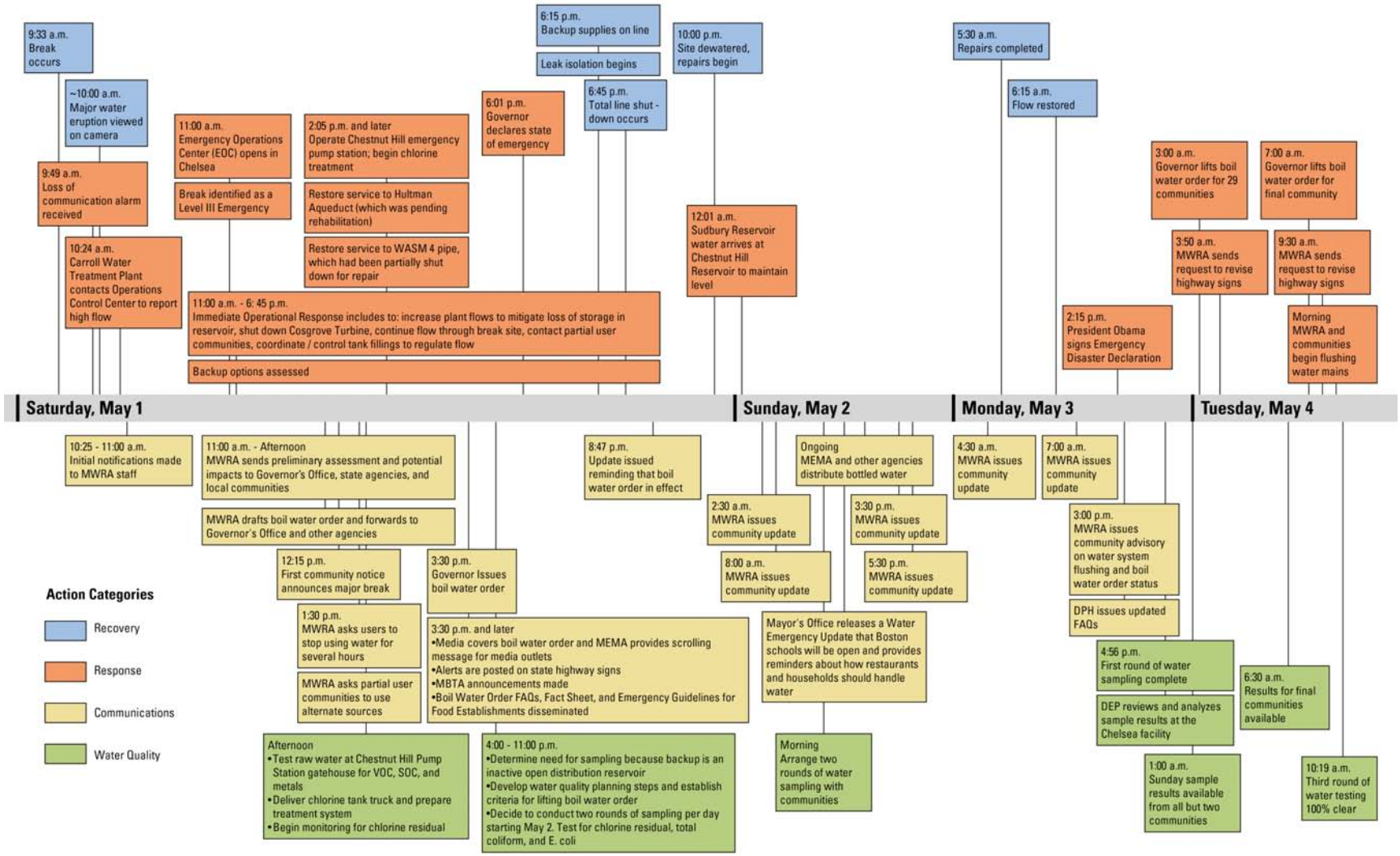


Exhibit 2.1. Timeline of Shaft 5A incident.

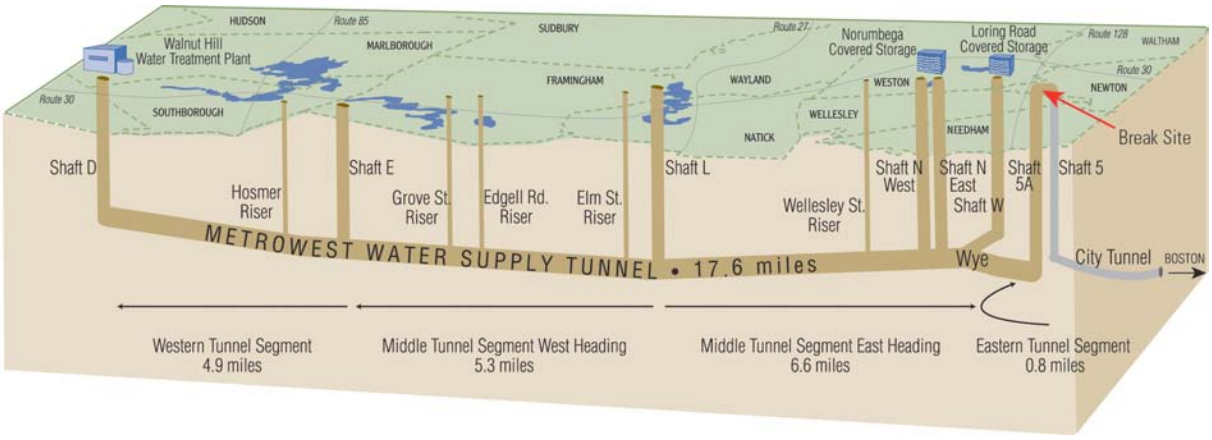


Exhibit 2.2. Map of MWRA MetroWest Water Supply Tunnel.

Source: MWRA, 2002.

Key operations and executive management were notified of the break by telephone between 10:25 a.m. and 11:00 a.m. Operations managers immediately went to the site to assess the break. Other managers proceeded to MWRA's Chelsea office and opened the Emergency Operations Center (EOC) at 11:00 a.m. to begin incident command.

The break was eroding the surrounding area, and staff feared that the high flow rate would eventually draw down storage tanks or cause further system damage. If storage tanks were drawn down or if there was another system rupture, there would not be enough pressure to serve MWRA's customers. In order to fix the leak, it was determined that it would be necessary to bypass the break and/or draw water from backup sources. Taken together, these concerns resulted in the designation by the MWRA Incident Commander of a Level III incident, that is, an incident with an anticipated major service disruption and threat to public health.

2.1.2 Response Coordination and Notification

MWRA staff at the EOC contacted relevant state and local agencies to apprise them of the emergency and seek their help in the response effort. The DEP, MDPH, MEMA, Office of the Governor, Boston Mayor, Boston Water and Sewer Commission (BWSC), the Massachusetts Department of Transportation (DOT), MWRA Board of Directors, fire marshals, state police, and outside engineering and construction support were contacted. Decisions on the overall approach to handling the emergency, including each agency's roles and responsibilities, were made during an initial conference call between MWRA's Executive Director, the Governor, and the Mayor of Boston. The Governor and Mayor would provide key leadership, MWRA was to be

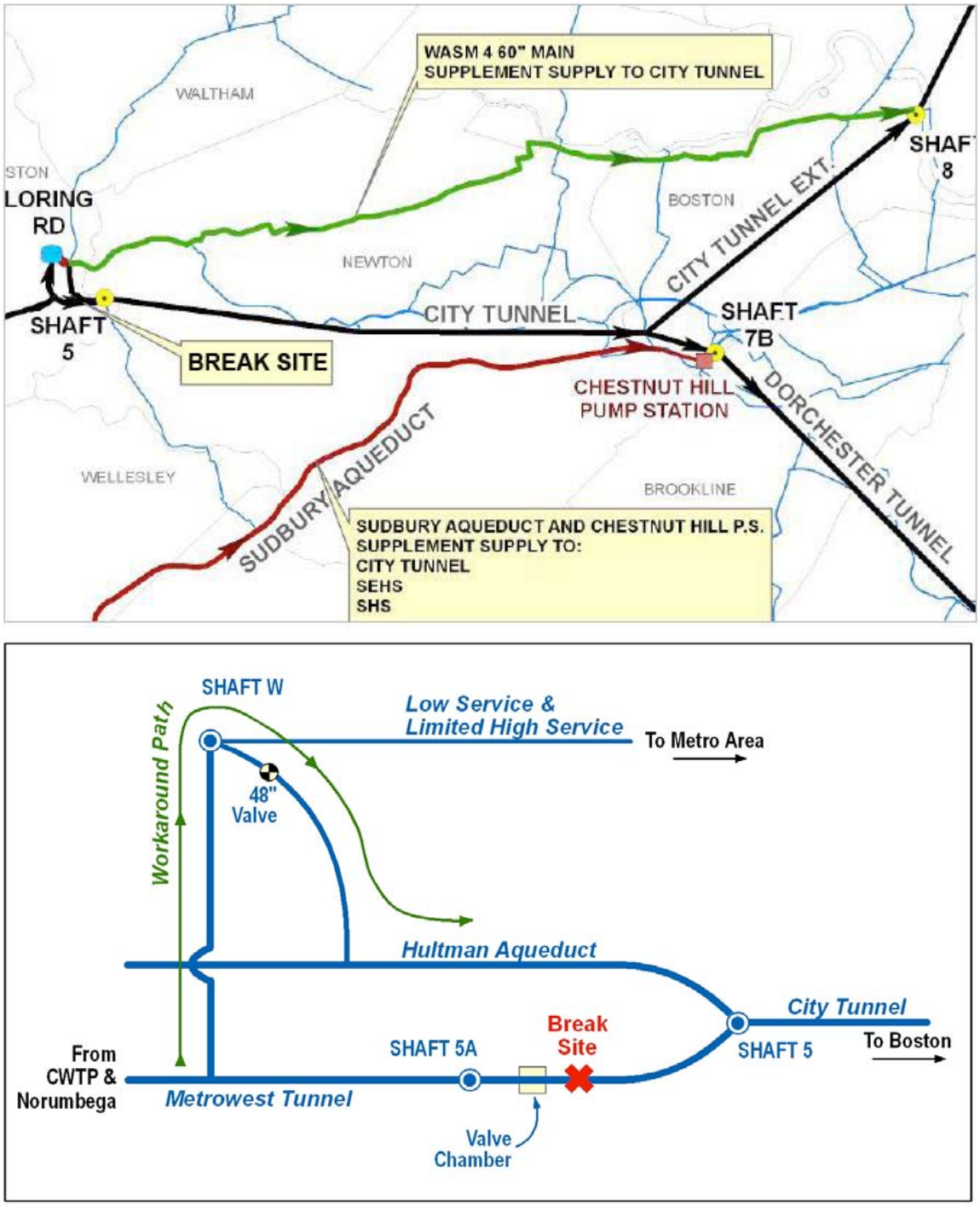


Exhibit 2.3. Broad and detailed views of MWRA system surrounding the May 1, 2010 break site.

Sources: MWRA, 2010f, 2011.

in charge of the water system (e.g., maintaining water pressure, establishing a backup supply, repairing the pipe, conducting water sampling, and ensuring the boil water notice could be lifted as soon as possible). Other state and local agencies would take charge of issues related to developing a boil water notice, writing and disseminating explicit instructions and guidance for affected populations, and distributing bottled drinking water. MWRA and DEP would develop a plan to ensure the safety of the backup system's drinking water and criteria for lifting the boil water notice.

MEMA is responsible for coordination and resource management for emergency events in the Commonwealth of Massachusetts, and opened their EOC (commonly called the "bunker") in Framingham, Massachusetts, to serve as the state command center. This was the setting for meetings between the MWRA Executive Director, the Governor, and the Mayor of Boston. An MWRA staff member was also stationed at the bunker to act as a liaison between MWRA and MEMA.

After contacting relevant agencies, MWRA contacted user communities. The MetroWest Tunnel serves 39 communities, 30 of which were affected by the break (see Exhibit 2.4). Partial-user communities were contacted and asked to rely on their alternative water sources; all other communities were apprised of the situation.

Exhibit 2.4. Communities affected by the Shaft 5A break

- Arlington
- Belmont
- Boston
- Brookline
- Canton
- Chelsea
- Everett
- Hanscom Air Force Base
- Lexington
- Lynnfield
- Malden
- Marblehead
- Medford
- Melrose
- Milton
- Nahant
- Newton
- Norwood
- Quincy
- Reading
- Revere
- Saugus
- Somerville
- Stoneham
- Swampscott
- Wakefield
- Waltham
- Watertown
- Winchester
- Winthrop

2.1.3 Response Implementation

Meanwhile, MWRA officials studied the distribution system and options for rerouting water. They decided to reroute flow around the break site by reversing flow in a seven-foot diameter pipe by opening a seldom-used 48" valve. This moved flow from the MetroWest Tunnel north and then south to a portion of the Hultman Aqueduct and into the City Tunnel toward Boston. This, combined with the use of Weston Aqueduct Supply Mains (WASM), allowed fully treated

water to bypass the break site and allow a shutdown (see the "Workaround Path" in Exhibit 2.3). However, in order to maintain sufficient supply for peak demand, it was also necessary for MWRA to use backup water that flowed through the Sudbury Aqueduct to the Chestnut Hill Reservoir and the Chestnut Hill Emergency Pump Station (see Exhibit 2.3).

Utilizing backup sources meant that water with emergency chlorination, and no other treatment, would flow into the system, making a boil water order mandatory under the operating agreement for the backup supply and DEP policy. MWRA recommended a boil water order to the Governor; the Governor issued the boil water order at 3:30 p.m. on Saturday. Communities, media outlets, and state agencies posted instructions for users. MDPH issued guidance for food establishments, food manufacturers and producers, and the health industry (e.g., hospitals and nursing homes). BWSC, BPHC, and MDPH also contacted medical facilities directly to discuss safe water practices and inform them if they needed to boil water or if their water source was safe to drink. DOT posted a boil water message on highway signs. Boston and other community police used bullhorns and loudspeakers to spread the message within the city. Some communities shared information with their residents via reverse 911 systems, which send a text or recorded message to registered individuals and households. MEMA began the process of procuring bottled water for distribution to all affected communities.

MWRA and DEP officials believed that emergency backup sources were likely free of bacteria and that the risk to users from consuming the chlorinated emergency backup water was small. However, the boil water order was required by both DEP policies and the operating agreement for the emergency pumping station. All parties deemed it a necessary precautionary measure. To provide data to demonstrate that the water was not contaminated and to lift the boil water order, MWRA and DEP agreed upon a water sampling regimen within all the affected communities beginning on Sunday, May 2. This entailed two rounds of samples per day, separated by eight hours; each round of sampling resulted in about 400 samples. DEP and MWRA agreed that two rounds of acceptable samples would be adequate to lift the boil water order. Using a presence/absence test (Colilert 18®) rather than the membrane filtration approach they typically use, it took roughly 18 hours to process the samples at the MWRA laboratory. This meant that the boil water order could not be lifted until about 20 hours after the last sample from the second round was delivered to MWRA.

By Saturday evening, MWRA had initiated the backup system as described above, isolated the break site, and stopped the flow of water. After dewatering the site, workers were able to begin replacing the missing coupling. Pipe repair was started at 10:00 p.m. on Saturday and was completed by 5:30 a.m. on Monday.

2.1.4 Maintenance of Service and Provision of Bottled Water Supplies

On Saturday, May 1, the Governor directed MEMA to provide bottled water to all communities that wanted it. MEMA procured water that day, and beginning the morning of Sunday, May 2, coordinated the distribution of bottled water to the 30 affected communities. MEMA set up two central staging areas for distribution and scheduled pickups by the communities. The communities organized emergency water distribution activities for their residents. In some communities, these distribution efforts went smoothly, with sufficient resources to schedule followup distribution events. In other communities, there were long lines and traffic jams, and residents were turned away as supplies ran out. Some communities made concerted efforts to check in with special-needs residents and seniors to ensure that these populations received priority assistance.

Other community activities went on *almost* as usual. Boston schools were in session on Monday, May 3, with plenty of hand sanitizer to cleanse hands, but no hot lunch. Most restaurants and medical practices were open but had to follow special precautions to reduce risk for patrons and patients. However, some major food manufacturers, retailers, and restaurants had to stop production or temporarily close due to the boil water order. As pointed out by many respondents, brewed coffee was unavailable throughout the affected communities.

2.1.5 Resumption of Normal Service

Early on the morning of Monday, May 3, repair workers completed welding operations and the pipe was tested. The MetroWest Tunnel went back into operation at 6:15 a.m.

Meanwhile, water samples had been collected, testing for total coliform and *Escherichia coli* (*E. coli*) had been completed, and the results were ready for DEP and MDPH review. Early Tuesday morning after reviewing two rounds of water samples, DEP, in consultation with MDPH and MWRA, recommended that the boil water order be lifted. The Governor announced the end of the boil water order for all 30 communities at 7:00 a.m. on Tuesday, May 4. Although the water was safe, authorities instructed users to flush their pipes. These instructions were carried by the media, community websites and reverse 911 systems, and agency websites.

Following the Shaft 5A event, MWRA restored the leak site (which involved removing tons of soil from the Charles River) and conducted several assessment activities. As required by the DEP, MWRA submitted a detailed After Action Report, which described the activities undertaken during the emergency response and included a timeline of events (MWRA, 2010c, 2010d). MWRA held a followup meeting with community water officials after the Shaft 5A break on June 3, 2010 to obtain their feedback on the emergency response. Comments focused on problems with notification efforts on the first day, difficulties reaching the EOC, and delays in the return of MWRA water quality test results. MWRA concluded that their ERP and associated emergency actions plans were adequate and did not require further revision. (MWRA

did make changes to some of their emergency response protocols and procedures as a result of the Shaft 5A incident, including, for example, updating community contact information.)

In addition, in November 2010, MEMA issued a Request for Proposals for an independent "After Action Report and Improvement Report" to assess responses to the floods that occurred in the state during March 2010, the Shaft 5A pipe break, and Hurricane Earl.

2.2 Summary of Roles, Responsibilities, and Key Decision Points

As illustrated in the previous section, the Shaft 5A break resulted in a complex response, involving numerous state and local agencies and organizations, with multiple actions occurring simultaneously. Stratus Consulting conducted several analytic exercises in order to better understand and assess the response to the Shaft 5A break.

Based on media content analysis (see Exhibit 2.5), archival and document review (including analysis of community websites – see Exhibit 2.6), and interviews with key responders, Stratus Consulting developed a summary of the key roles that each state and local agency and organization undertook during the event. Exhibit 2.7 encapsulates this information. As shown in the exhibit, while in some cases each responder's roles and activities were distinct, in other cases (e.g., communication) several agencies took on similar or overlapping roles.

Exhibit 2.5. Analysis of media reports on the Shaft 5A incident

To help form a clear picture of the MWRA incident, Stratus Consulting conducted a search for media coverage surrounding the event. Almost 50 media sources were analyzed in order to review the response actions undertaken by MWRA and state and local entities and to identify public reaction to these actions. The review covered several national news sources; regional print, radio, and television media; and local print news sources.

Close to 600 stories covered the incident between May 1 and May 16. News articles focused heavily on the initial news of the break, repair efforts, the missing coupling, and the lifting of the boil water order. However, the media also played an important role in sharing public health information, including boil water instructions, system flushing instructions, and several stories related to dental or medical practices. A large number of articles focused on adapting to the crisis, including coverage of information on emergency water distribution, the availability of bottled water, and school and restaurant continuity.

A number of opinion articles and letters to the editor appeared both during and after the incident. These pieces tended to focus on the handling of the Shaft 5A break, the equity of the bottled water distribution process, and whether water distribution was necessary or if more emphasis should have been placed on just boiling water.

Overall, both the media coverage and public polls conducted by the media showed a high level of satisfaction with the response by MWRA, the state, and other key responders.

Exhibit 2.6. Analysis of community response actions

Although MWRA, state agencies, and the media took an active role in information-sharing during the incident, the 30 affected communities also took various actions to keep their residents safe and informed. A review of community websites and local media coverage provides an overview of the types of community actions taken and relative activity levels during the Shaft 5A incident. Admittedly, although some form of documented response activity was available for all but one community, this analysis is hindered by the fact that some communities had removed website content related to the May 1 incident prior to our analysis. Likewise, although some communities may have had very active health departments or effective water distribution sites, documented information was not available for every community.

Of note, local health departments or boards of health, departments of public works, fire departments, and police departments played an active role in the response. The majority of communities provided information through their website and reverse 911 systems. Most communities offered public bottled water distribution and provided basic information regarding the boil water order. A few communities also knocked on the doors of senior citizens and visited public housing complexes to ensure those residents had bottled water. In addition, a small number of communities posted notices on their public access television stations.

Readers from other states should bear in mind that Massachusetts' governance is based on a municipal government system, rather than a county-based system. Most counties in the Commonwealth currently exist only as geographic regions and have no county government. Municipal governments, which are incorporated with either "town" or "city" designations, individually are responsible for providing their citizens with local public services, such as water works, emergency services, and health department activities. The communities affected by the Shaft 5A break include 12 cities and 17 towns. Cities are larger and are typically governed by a mayor and an elected city council or board of aldermen. In most cases, the communities designated as towns rely on a system based on boards of selectmen (Citizen Information Service, Undated; Commonwealth of Massachusetts, 2011).

Exhibit 2.7. Agency/organization roles and responsibilities in May 1, 2010 event

Agency/organization	Responsibilities or actions
Governor of Massachusetts	▸ Serve as Statewide Incident Commander, responsible for response coordination ▸ Issue boil water order ▸ Declare emergency ▸ Lift boil water order (Appendix C, Section C.14) ▸ Act as public face of statewide response
Massachusetts Water Resources Authority	▸ Repair the break ▸ Establish emergency backup system/run water system ▸ Responsible for "initial" draft of boil water order ▸ Test water quality ▸ Notify and update the public, elected officials, community leaders (selectman, mayors, town managers), and state representatives and senators (Appendix C, Section C.13) ▸ Executive Director Laskey communicates with the media

Exhibit 2.7. Agency/organization roles and responsibilities in May 1, 2010 event (cont.)

Agency/organization	Responsibilities or actions
Massachusetts Department of Environmental Protection	▸ In charge of water quality/safety ▸ Recommend declaration of emergency and issuance of boil water notice, in consultation with MDPH ▸ Decide criteria for lifting boil water order ▸ Review water sample results to ensure safety ▸ Provide fact sheet on boil water order (Appendix C, Section C.2)
Massachusetts Emergency Management Agency	▸ Coordinate response efforts and resource management for emergency events ▸ Coordinate emergency water distribution ▸ Apply for Federal Emergency Management Agency (FEMA) funding ▸ Organize call center with staff of Mass 2-1-1, a service of United Way ▸ Provide situational awareness ▸ Coordinate communication to FEMA, among state agencies, and to affected communities and the public
Massachusetts Department of Public Health	▸ Inform health care providers on potential illnesses and proper care following drinking water exposure (Appendix C, Section C.4) ▸ Provide frequently asked questions (FAQs) for a boil water order (Appendix C, Section C.3) ▸ Provide emergency guidelines for food establishments (Appendix C, Section C.5) ▸ Provide emergency assistance to food manufacturers/producers ▸ Consult with DEP and MWRA on water testing and on the decision to lift the boil water order ▸ Provide post-boil water instructions for consumers, food establishments, hospitals, and dental practices (Appendix C, Sections C.15, C.16, C.17, C.18)
Massachusetts Executive Office of Energy and Environmental Affairs	▸ Serve as liaison between MWRA and state-level government, including DEP and the Governor ▸ Represent the Governor in communication with the public ▸ Secretary of EOEEA is chair of MWRA Board of Directors
State Fire and Police	▸ Coordinate with MWRA during initial stages of incident (state fire marshal) ▸ Communicate to community fire departments regarding potential concerns and response if water system loses pressure (state fire marshal) ▸ Investigate the break site and determine if terrorism is involved (state police)
City of Boston, Office of the Mayor	▸ Mayor is Incident Commander for the City of Boston ▸ Notify Boston citizens of emergency using a wide range of methods (police bullhorns, notifications on public transit, reverse 911 systems, website, Twitter, call center) coordinated from the Office of Emergency Management (Appendix C, Sections C.6, C.9, C.10) ▸ Target water distribution to vulnerable populations ▸ Act as Environmental and Energy Services liaison between MWRA and the City of Boston ▸ Answer about 12,000 phone calls from Boston and other community residents via 24-hour constituent engagement call center (Appendix C, Section C.9) ▸ Call public school students with a recorded message that school will be held, but with precautions (Appendix C, Section C.8)

Exhibit 2.7. Agency/organization roles and responsibilities in May 1, 2010 event (cont.)

Agency/organization	Responsibilities or actions
Boston Water and Sewer Commission	▸ Coordinate with Boston Fire Department regarding plan if water system loses pressure ▸ Coordinate with MDPH on water use in medical facilities, including contacting hospitals in Boston to notify them if they need to boil water or if their water is fully treated ▸ Coordinate with MWRA regarding work on backup water system and flushing mains at appropriate locations
Boston Public Health Commission	▸ Develop and disseminate information to Boston community (residents, restaurants, health care institutions, schools) (e.g., Appendix C, Section C.7) ▸ Protect health system infrastructure (ensure it can function during an emergency) ▸ Ensure water delivery to health care facilities and vulnerable residents in Boston ▸ Open Medical Intelligence Center to enable communication and collaboration among medical facilities in the event people became ill from the water
Community Mayors, Managers, and Selectpersons	▸ Notify relevant city departments including emergency management, public works, health, and others ▸ Reach out to residents via reverse 911 systems, email, websites, and other means
Community Departments of Public Works/Water Departments	▸ Coordinate with MWRA and DEP to collect water samples ▸ Assist with the distribution of bottled water
Community Fire and Police Departments	▸ Serve as emergency management director in some communities ▸ Play key role in emergency communication and response internally and through public information, reverse 911 systems, and emergency water distribution systems (e.g., Boston city police used bullhorns to announce the boil water order)
Community Health Departments	▸ Provide assistance to food retailers ▸ Post additional boil water information or guidance on websites
Community Human Service or Housing Agencies	▸ Make at-risk residents aware of boil water order ▸ Contact elderly or disabled residents to arrange water delivery
Nonprofits	▸ Help vulnerable populations acquire bottled water (Meals-on-Wheels, the Council on Aging, and others)

Exhibit 2.8 provides a flowchart that depicts the key decisions made during the Shaft 5A incident, the responsible agency, and the actions that led to or resulted from these decisions. Decisions are categorized according to whether they related to emergency communication, response, or recovery. As illustrated in the exhibit, although communication activities involved a wide range of notification and information-sharing tasks, the key decisions addressed were (1) whether to issue a boil water notice and what this notice should say, and (2) whether to distribute bottled water to affected communities. Emergency response activities involved a number of technical decisions relating to identifying the emergency level, determining and activating backup water systems, and deciding on the sampling plan and analysis criteria. Recovery activities focused on determining the approach for repairing the broken pipe and ensuring that repairs were successful.

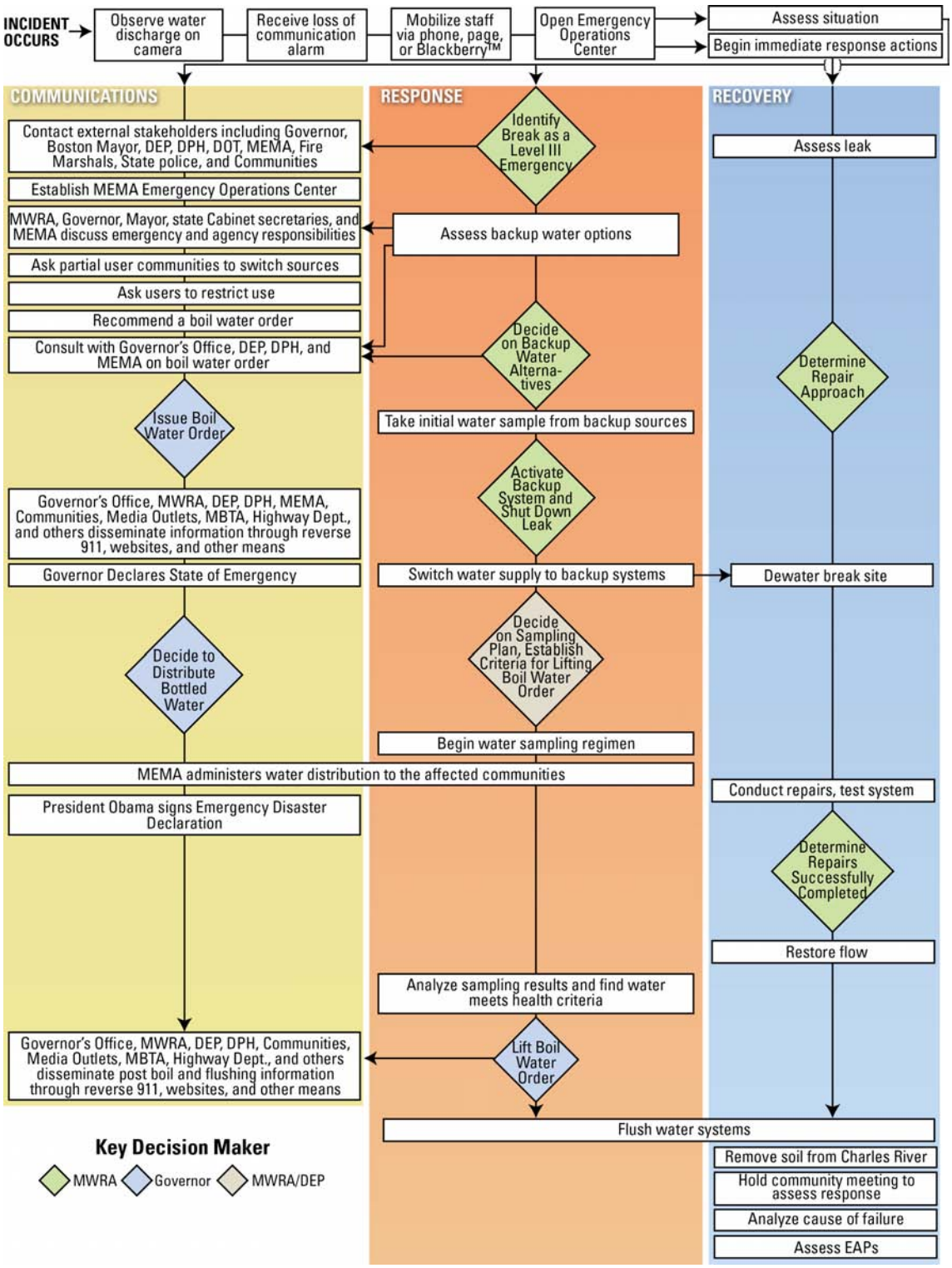
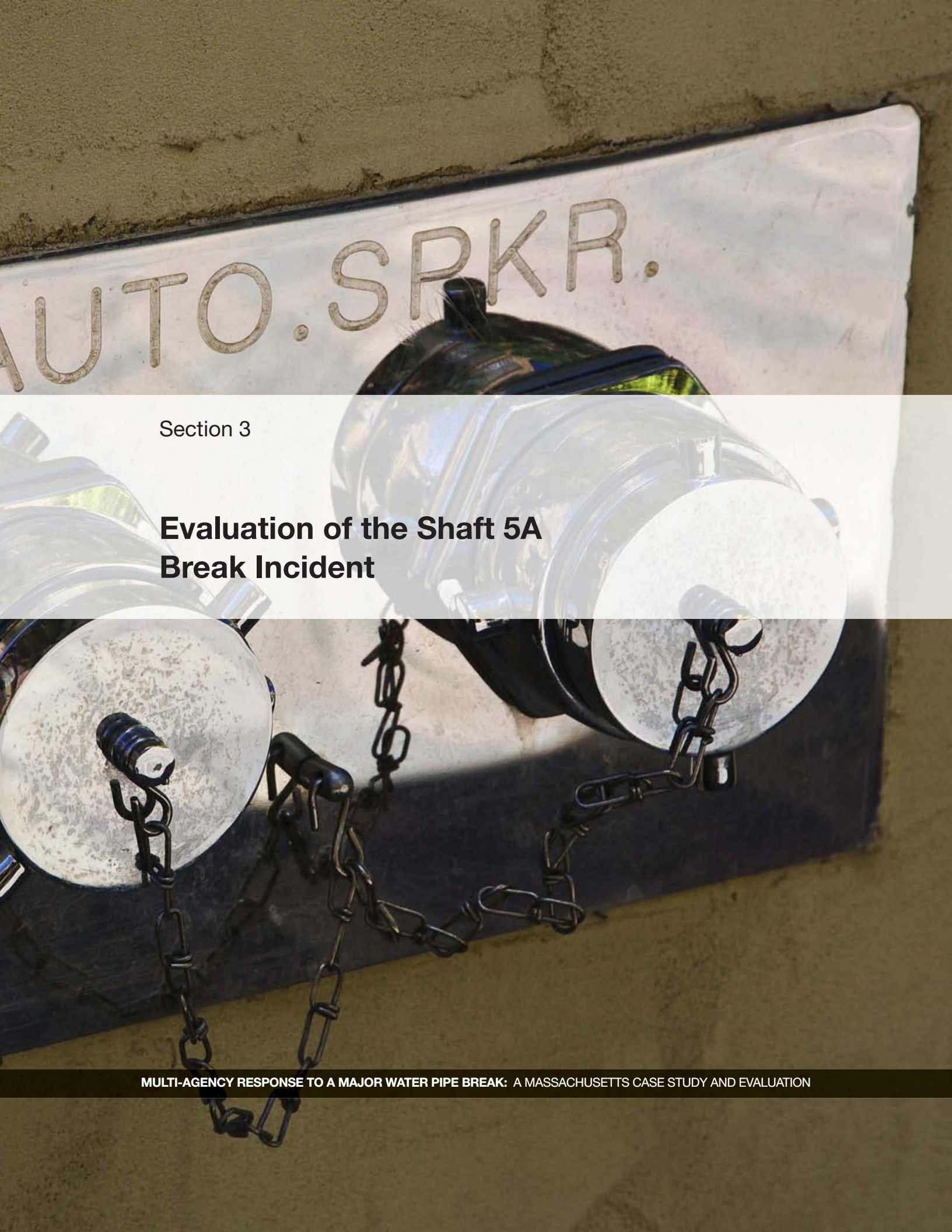


Exhibit 2.8. Key decisions in May 1, 2010 Shaft 5A incident.



Section 3

Evaluation of the Shaft 5A Break Incident

3. Evaluation of the Shaft 5A Break Incident

This section presents an evaluation of the response to the Shaft 5A break by the MWRA and other state and local agencies. Section 3.1 describes the framework used for this assessment. In Section 3.2, we apply the evaluation framework to characterize and assess the emergency response.

3.1 Evaluation Approach

The approach for evaluating the response to the MWRA Shaft 5A pipe break was developed based on a review of selected "model" emergency response planning protocols and guidance. As described below, two emergency response planning models were combined to create an evaluation rubric for the Shift 5A incident: (1) a framework developed by the WaterRF that identifies and describes 12 major action areas relevant to most emergency response scenarios, and (2) the DEP's *Emergency Response Planning Guide for Public Drinking Water Systems*. These models are described below.

Selection of a Conceptual Template to Guide Evaluation of the MWRA Shaft 5A Break Incident. Over the past decade, the drinking water and wastewater sectors have expended considerable effort to develop emergency planning and response protocols. Based on a review of this literature (see Appendix D) and our long-term involvement with the issue of water security, Stratus Consulting selected an emergency response template developed by the WaterRF (formerly the American Water Works Association Research Foundation, or AwwaRF) for use in structuring an evaluation approach for the Shaft 5A break incident. Specifically, the framework can be found in the WaterRF's *Emergency Response and Recovery Planning for Water Systems: A Kit of Tools* (AwwaRF, 2006). WaterRF conducted this study to improve the state of the practice of disaster response, recovery, and business continuity planning for water utilities. Study objectives included identifying and reviewing existing guidance on emergency response planning, identifying gaps in and best practices for water utility emergency plans and programs, and developing a user-friendly kit of tools for utilities to use as they develop and/or update their emergency plans and overall security programs. As part of this study, WaterRF developed a generic framework that represents 12 major aspects, or action areas, relevant during most emergency response situations. This framework was configured to be consistent with leading emergency response protocols, including those of the U.S. Environmental Protection Agency (EPA, 2004) and the American Water Works Association (AWWA, 2001a, 2001b), and to incorporate additional emergency response best practices, as identified during the WaterRF study.

Illustrated in Exhibit 3.1, the framework depicts a sequential logic that typifies many emergency response situations. Evaluation of the Shaft 5A incident in terms of the 12 action areas confers several advantages: (1) it supports focused critique, rather than blanket characterizations of the overall response effort; (2) it helps to differentiate roles among the various response partners; and (3) it provides criteria with which to judge the adequacy of a selected emergency response activity. As the exhibit shows, the 12 action areas are cross-referenced (with color coding) to several widely recognized topics within the overall domain of emergency planning, including response planning, business continuity planning, recovery planning, and emergency communication planning. This is done to build vocabulary and conceptual approaches that water utilities can use for the widest possible array of emergency events and response approaches.

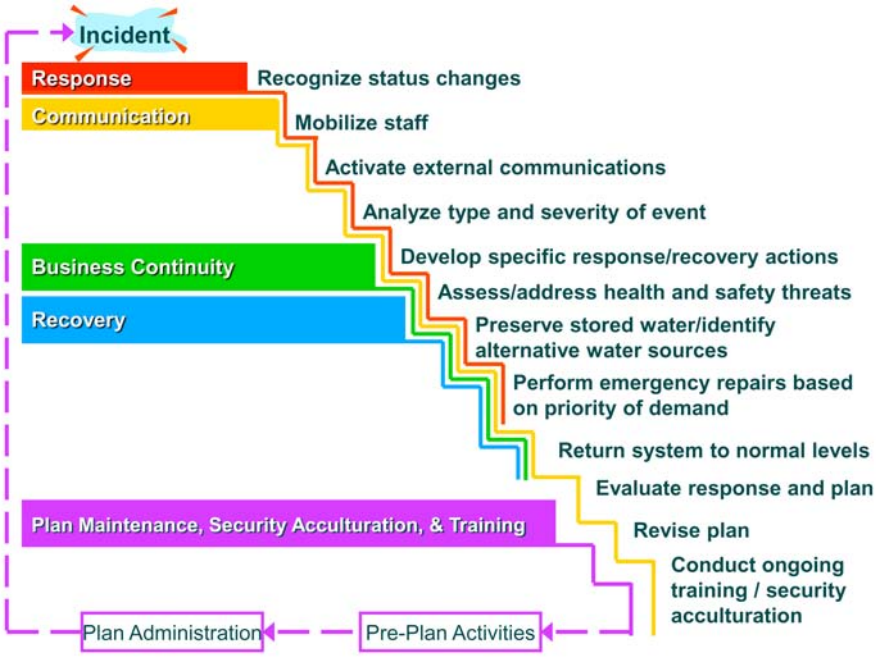


Exhibit 3.1. Water Resources Foundation emergency framework.

Source: AwwaRF, 2006. Reprinted with permission.

The framework illustrated in Exhibit 3.1 was the primary conceptual template used to evaluate the response to the Shaft 5A break. For each action area, we describe the action area requirements, characterize MWRA response actions, and assess the extent to which MWRA and, as appropriate, other state and local agencies involved in the emergency response succeeded in meeting the action area requirements.

DEP's *Emergency Response Planning Guide for Public Drinking Water Systems*. This evaluation is also framed in terms of the DEP's emergency response guidance, which advises Massachusetts water systems to articulate a mission statement and associated goals for emergency response. The guidance includes the following sample language for such a mission statement and associated goals:

> ***Mission Statement for Emergency Response*:** *In an emergency, the mission of XYZ water system is to protect the health of our customers by being prepared to respond immediately to a variety of events that may result in contamination of the water or disruption of supplying water.*
>
> ***Goal 1*:** *Be able to quickly identify an emergency and initiate timely and effective response action*.
>
> ***Goal 2*:** *Be able to quickly notify local, state, and federal agencies to assist in the response*.
>
> ***Goal 3*:** *Protect public health by being able to quickly determine if the water is not safe to drink or use and being able to immediately notify customers effectively of the situation and advise them of appropriate protective action*.
>
> ***Goal 4*:** *Be able to quickly respond and repair damages to minimize system down time*.

Although not explicitly adopted by MWRA, these mission and goal statements are used in this report as a generic template to gauge and evaluate MWRA response actions during the Shaft 5A incident.

3.2 Evaluation of Response to the Shaft 5A Break by Emergency Response Action Area

This section describes the 12 response action areas that are critical to most emergency situations. Although these actions do not necessarily occur in the order described below (in fact, actions often occur simultaneously), they are presented as a sequence to enhance a focused review of the overall response effort. For each emergency response action area, the specific steps undertaken by MWRA and other state and local responders are described and assessed.

3.2.1 Action Area 1 – Recognize Status Changes and Activate Plan

A utility's ERP is activated when the utility becomes aware of a threat or an incident with the potential to disrupt operations or service delivery or to jeopardize public health and safety. The rapid shift from business as usual to an emergency response mode of activity is crucial to a

focused and effective response. As soon as a threat is recognized, the utility must make an initial assessment as to the type of threat and the overall severity of the incident (e.g., minor alert, major emergency, situation beyond the utility's control).

Characterization and Assessment. MWRA's response to the Shaft 5A break was swift and focused. The break was identified by means of multiple, nearly simultaneous inputs from security systems and remotely monitored data streams. The break occurred at about 9:30 a.m. on Saturday, May 1. A loss of communication alarm for Shaft 5A occurred at 9:49 a.m., indicating a high water flow, followed by observation of the leakage on security cameras. Sometime after 10:00 a.m. the leak became a torrent of water. Key Field Operations and Executive Office managers were notified by phone at about 10:25 a.m. A little more than one hour after the loss of communication alarm, the MWRA Incident Commander had appropriately classified the event as a Level III incident, characterized potential service impacts, and notified MWRA staff and many relevant and responsible partners, including the Governor's office, the Boston Mayor's office, and the DEP.

3.2.2 Action Area 2 – Mobilize Staff

When a change in status has been recognized, the responding agency must mobilize staff to respond to the threat or incident. This may entail activation of an EOC and/or notification of a pre-configured emergency response team.

Characterization and Assessment. MWRA was able to rapidly mobilize an emergency response team; an impressive accomplishment given the incident occurred on a Saturday. MWRA staff were quickly notified based on pre-established paging groups established in the ERP, and the EOC was opened and fully operational within 70 minutes of the initial alarm. Most MWRA emergency response staff (including management, operations, engineering, construction, and support staff) were notified within one hour of the first alarm and – in conformance with MWRA emergency protocol – quickly assembled at pre-designated locations, either the MWRA EOC or the break site.

MWRA and their partners quickly formed an effective operations approach and hierarchy. Within MWRA, the Incident Commander roles and supporting roles were quickly assigned and followed. (A key exception was the failure to identify a person to record all key decisions and events during the Shaft 5A emergency.) Decisions on the overall statewide approach to handling the emergency, including each agency's roles and responsibilities, were made during an initial conference call among MWRA's Executive Director, the Governor, and the Mayor of Boston.

Activation of the EOC and site control was capably managed by the first staff onsite. As other team members arrived, a response hierarchy and effective distribution of labor and responsibility were established. Minor problems relating to the incident command involved the need for

additional backup staff, especially in the earliest stages of the incident. Some MWRA respondents noted that it would have been helpful to have additional staff at the EOC, who could have provided assistance in a number of ways, from procuring supplies and food, to answering phone calls, to driving senior managers to meetings at the MEMA bunker, the leak site, or even to their homes to shower or get some rest. A related issue was that, in retrospect, MWRA encountered some difficulties in determining the most appropriate way to use available staff and/or did not always provide explicit directions to staff for conducting these backup tasks. For example, MWRA did not designate a person to maintain a detailed situational status log to record internal calls and decisions. These issues were due, at least in part, to the fast pace of the emergency response and the fact that the nature of the emergency resulted in many more outside calls than anticipated (typically, MWRA focuses on operational communications and does not receive outside calls from the public).

MWRA was quick to inform relevant response partners and oversight agencies, who were also able to effectively mobilize their staff (see Exhibit 3.2).

Exhibit 3.2. State and municipal agencies and organizations mobilized in response to the Shaft 5A incident

- DEP
- MEMA
- MWRA Board of Directors
- MWRA service communities
- MDPH
- Office of the Mayor, Boston
- Office of the Governor
- State and local fire marshals
- State and local police

3.2.3 Action Area 3 – Engage in External Communication

Effective communication is essential to every step in the emergency response process. A utility's communication staff must begin to collect information about the incident, prepare instructional or guidance material, and communicate with the media, key stakeholders, and the public. Communication staff should work from templates and draft materials developed as part of the emergency preparation process rather than during the crisis itself. It is important to note that although this reporting framework treats external communication as a discrete action area, relevant communication actions occur under all action areas.

Characterization and Assessment. External communication may have been one of the most complicated aspects of the Shaft 5A response effort. There are several facets to this action area, including (1) communication with the public, medical facilities, schools, restaurants, and the media; (2) communication between and among MWRA staff and their incident response partners; and (3) communication on the part of MWRA's 30 customer communities. Because nearly every response agency and organization had communication responsibilities, it was important that these groups coordinated their messages to ensure consistency.

Overall, MWRA leadership expressed a desire to maintain an open and transparent response process, providing liberal media access to the site of the break and to MWRA staff as well as information about key decisions. MWRA communication staff get high marks from the media and partner organizations because they were always available, responded quickly and thoroughly to questions and requests for information, and provided ample access to agency executives. MWRA's primary spokesperson, Fred Laskey, was lauded by the media, response partners, and the public for his candid and open manner of communication.

For the most part, MWRA and the other responding agencies presented a united front in terms of their communication with communities, residents, hospitals, restaurants, schools, and others affected by the Shaft 5A break. However, although the responding organizations did have pre-existing language and templates to help ensure quick and consistent communication, they nevertheless count development of language for emergency notification and guidance materials as a challenge. For example, MDPH and BPHC drafted question and answer guidance that initially differed on whether to use boiled water for hand-washing. This disparity stemmed from differing views on whether it is preferable to avoid potential health effects from the use of potentially contaminated un-boiled water for hand-washing or whether issuing this guidance would actually result in fewer people (especially students) washing their hands. The involved agencies recognized this inconsistency before materials were issued and after consultation decided to recommend that it was not necessary to use boiled water for hand-washing.

In addition, guidance was not issued to affected communities on how to handle bottled water distribution. As described earlier (see Exhibit 2.6) the Commonwealth of Massachusetts does not have a county government structure, and thus each city and town is independently responsible for water distribution planning and implementation. Overall state-level guidance might have helped reduce some of the challenges faced by the affected cities and towns (e.g., traffic jams and insufficient supplies for vulnerable populations – see Section 3.2.7, Action Area 7 – Preserve Stored Water and Identify Alternative Water Sources).

Another challenge related to developing guidance was that post-boil order guidance may have been overly cautious given the fact that testing results showed that the water had not been contaminated. The guidance included instructions for flushing household and building water lines after the boil order was lifted in order to clear plumbing of potentially contaminated water. These instructions were based on review and revision of existing guidance that had been recently developed for a boil water event that, unlike the Shaft 5A incident, involved water contamination. The response team did not account for the fact that, unlike the previous incident, the water from the Shaft 5A event was not contaminated and so did not require flushing.

Blackberries, email, and cell phones were a key means of internal communication among MWRA staff as well as external communication with other state and local responders and affected communities. Frequently mentioned problems with this approach included (1) emergency contact lists lacked up-to-date cell phone numbers and email addresses, and

(2) difficulties were associated with keeping electronic equipment charged. With a few exceptions, MWRA was able to contact other responders and community leaders, but staff in MWRA's Communication Department noted that they would have benefited if their web-based Community Contacts tracking application (see Appendix C, Section C.1), which was started but not completed prior to the Shaft 5A break, had been fully operational.

As outlined in Exhibit 3.3, MWRA and their partners used a variety of communication media to inform and instruct the public about the incident and associated response actions. Based on our interviews and review of community websites and media stories about the incident, the combined use of these methods enabled MWRA and the other response agencies to successfully reach most people affected by the pipe break and boil water requirement. Exceptions were noted, however. For example, at least one community leader complained that he and his staff received notification from local political leaders prior to notification from MWRA.

Exhibit 3.3. Communication media utilized by MWRA and partner agencies during the Shaft 5A break incident

- Websites
- Reverse 911 services
- Police loudspeakers and visits to restaurants
- Programmable roadway and transit signs
- Collaboration with radio, TV, and print media
- Emergency call centers (MEMA, Boston Office of Emergency Management)
- Face-to-face interaction with key stakeholders (e.g., hospitals)
- Public school information lines
- Postings and hand cards on public water fixtures
- Postings and notices in doorways
- Twitter (Boston Office of Emergency Management)

Call centers received and successfully handled many calls from individuals, restaurants, and businesses. The two main call centers that were open during the Shaft 5A incident were run by MEMA (which organized a call center with staff of Mass 2-1-1, a service of the United Way), and the Boston Office of Emergency Management, which answered 12,000 phone calls from Boston and other community residents via their 24-hour constituent engagement call center (the typical number of calls over a four-day period is about 2,000). Questions included which towns were affected by the leak, what the boil water notice meant, whether bottled water was available and if so where the distribution points were, what to do if they (or their dogs) drank the tap water, whether water filters were effective in treating the tap water, whether coffee was safe to drink, and whether they could wash with tap water.

Overall, the Boston Office of Emergency Management call center handled their job effectively – public comments were very positive. Some challenges stemmed from the huge number of calls and the need to update guidance based on changing information received from BPHC and other response agencies. The call center reviewed their performance after the event and is developing a number of procedures to enhance their ability to respond to future emergencies. These improvements include development of a sign-in/sign-out sheet for both tracking and recognizing the work of call center volunteers; a single, user-friendly phone system instruction sheet; a list of

phone system login numbers and user codes; a two-tiered system to manage incoming calls; and a training program for volunteers. The city is also working to develop a way to efficiently communicate up-to-the-minute talking points from call center staff, perhaps through an online system or searchable knowledge base.

Finally, it is important to note that although MWRA and MEMA played important roles in external communication, each affected community was also responsible for notifying and communicating with their residents, businesses, hospitals, and schools.[1] Many towns used reverse 911 services to notify residents of the leak and the boil water notice. The effectiveness of these systems was closely related to the level and type of service purchased and the ability of the community leaders to proactively add cell phone subscribers to their call lists, which typically had covered only landline subscribers.

3.2.4 Action Area 4 – Analyze the Type and Severity of an Event

A careful assessment of the type and severity of the emergency incident must be conducted. This assessment is intended to provide information regarding the damage that has occurred or may occur as a result of the incident and to characterize the severity of the emergency.

Characterization and Assessment. Within 90 minutes of the initial alarm, MWRA staff had identified the problem, qualified associated impacts and risks, and classified it as a Level III – Major Emergency. As described in Exhibit 3.4, and as regulated by the DEP, a Level III incident is a "very significant disruption" that may "affect more than 50% of the system" and "require more than 72 hours to be repaired or resolved." Further, Level III events may require declaration of a state of emergency and/or issuance of a "do not drink," "do not use," or "boil water" order. Guidance materials published by DEP provide examples of Level III events, including "a major line break or other system failure resulting in a water shortage or requiring system shutdown."

Exhibit 3.4. Definition of a Level III – Major Emergency

These incidents are very significant disruptions that affect more than 50% of the system and/or are anticipated to require more than 72 hours to be repaired or resolved. The system may experience significant mechanical or contamination problems where disruption in supply is inevitable and issuance of a health advisory is needed to protect public health. Major emergencies must be reported to DEP as soon as possible to determine the best available means to protect customers' health. This type of emergency may require a Declaration of State of Water Supply Emergency and or a Boil, Do Not Drink, or Do Not Use Order. System personnel are directed to the situation, and outside entities are notified to aid in the response.

Source: DEP, 2010.

1. As described earlier, Massachusetts does not have an overarching county structure. Each city and town has their own independent government.

Managers in MWRA's Office of Emergency Preparedness (OEP) notified the state fire marshal to discuss issues related to possible loss of water pressure (see Section 3.2.6, Action Area 6 – Assess and Address Health and Safety Issues) and the role of the fire marshal in explaining these issues to local fire departments. MWRA OEP managers also met with the state police. The police viewed the video of the pipe break, investigated the break site, and determined that the incident did not involve intruders or terrorism. It is not clear if MWRA worked with the police to assess the potential for opportunistic criminal or terrorist activities during the emergency response.

Beyond classification of the incident, MWRA conducted several real-time, site-specific engineering analyses to determine potential impacts associated with various response action scenarios, helping to qualify the incident for statutory and elected authorities including the Governor and the Mayor of Boston. Based on these site and condition assessments, the Governor was able to issue a boil water notice within six hours of the break and just over an hour after determining the best backup option for the service area.

3.2.5 Action Area 5 – Develop Specific Response and Recovery Actions

A utility should draw upon pre-existing protocols in order to formulate and execute specific actions for particular types of emergencies and component failures. Guidance materials published by EPA, AWWA, WaterRF, and others recommend that utilities draw upon their completed vulnerability assessments to develop hazard-specific response protocols for critical systems and components.

Characterization and Assessment. In the words of one MWRA interviewee, "our recovery began before the shut down." What this means is that MWRA and their partners carefully but quickly assessed the situation and determined an appropriate emergency response strategy in light of the best options for system and service recovery. Had MWRA shut off the affected segment of pipe before determining an appropriate workaround, backflow pressure could not have been maintained, system pressure would have dropped precipitously, and water delivery in the greater Boston area would have been lost, greatly exacerbating the incident (e.g., through loss of water for fire fighting, drinking, and toilet flushing; possible water contamination from backflow or back siphoning; and other public health concerns). Instead, MWRA executed a mindful recovery process in which the damaged segment of pipe was allowed to stay in operation until an alternative supply and distribution regime could be brought online. Adoption of this approach allowed MWRA and their partners to address service restoration as a "simple, operational issue" that was consistent with MWRA's ERP. The MWRA ERP includes a base plan plus 166 EAPs that outline specific response activities for specific locations within the water system. One of these EAPs covers the area where the Shaft 5A break occurred. Consequently, MWRA's assessment of their backup options initially focused on activation of the Chestnut Hill Emergency Pump Station (along with the Sudbury Aqueduct and Chestnut Hill Reservoir), and the utility was able to initiate this option and several others described in the EAP.

3.2.6 Action Area 6 – Assess and Address Health and Safety Issues

The most immediate actions to be taken by the utility in the face of an emergency are those that reduce safety or health concerns. This includes actions to ensure public health and repair critical water system components.

Characterization and Assessment. The MWRA and their partners quickly and effectively recognized and addressed significant health and/or safety-related issues. The most significant potential health issue related to ensuring the quality of the drinking water supply. Based on our interviews, the series of decisions involved in ensuring safe drinking water occurred quickly and without contention. One of the first actions taken after the MWRA EOC opened was to order tank trucks of chlorine in case it would be required to treat backup water sources. Soon afterward, MWRA decided to use the Chestnut Hill Reservoir as a water source. Consequently, a chlorine treatment system was put in place and monitoring of chlorine residual began immediately. Use of the Chestnut Hill Reservoir required a boil water notice based on MWRA's operating agreement with DEP. MWRA drafted a boil water notice and sent it to the Governor's office for coordination with other state agencies, and the Governor issued the boil water notice at 3:30 p.m. Prior to the notice, MWRA issued announcements that first asked residents to curtail their use of water and then requested them to stop using water for a few hours.

Other related health and safety issues were also quickly identified and addressed. For example, MDPH issued emergency guidelines for food establishments, food manufacturers and producers, and health care providers (e.g., on illnesses and proper care following drinking water exposure). MDPH also developed FAQs for a boil water order. When the boil water order was lifted, MDPH provided post-boil instructions for consumers, food establishments, hospitals, and dental practices (see Appendix C, Sections C.15–C.18 for examples of these notices). In terms of potential health effects, MDPH issued a clinical advisory on waterborne illness from exposure to drinking water (see Appendix C, Section C.4) and conducted a series of telephone calls with local health departments and the medical community.

BPHC also played a major role in developing and disseminating water safety and medical information to the Boston community (including residents, restaurants, health care institutions, and schools). BPHC disseminated information on potential medical implications of the event through activation of the Medical Intelligence Center, which enables communication and information sharing with hospitals, emergency medical services, public health departments, community health centers, long-term care facilities, and other health partners.

Further, BWSC and BPHC worked together and with MDPH to contact hospitals and other medical facilities in Boston to discuss safe water practices and inform them if they needed to boil water or if their water source was safe to drink (based on information provided by BWSC on whether each hospital was receiving fully treated water from the Hultman Aqueduct or chlorinated water from the Chestnut Hill Reservoir).

Other critical health and safety issues that MWRA immediately identified were related to the need to maintain water pressure throughout the system (described under Action Area 5). MWRA staff understood that an immediate shutdown of the pipe at Shaft 5A for repairs would cut off the water supply to more than two million people and would result in loss of water pressure, making fire protection extremely difficult. Loss of water pressure could also result in backflow (i.e., reversal of the direction of the water flow, which creates the potential for contaminated water to enter the distribution system) and other sanitation concerns (e.g., there would be no water for hand-washing or flushing toilets). MWRA was able to balance the need to keep the pipe open until the backup water systems and boil order notice were ready with their legitimate concerns that the leaking water would cause further pipe rupture, a loss of service, and/or the electric power poles at the site to collapse, complicating the response effort and creating a risk to onsite personnel.

3.2.7 Action Area 7 – Preserve Stored Water and Identify Alternative Water Sources

It is important for utilities to minimize disruption of the supply of water during an emergency and to ensure that water is made available to customers based on priority of demand until normal operations can be restored. One way to minimize disruption is to identify alternative water supplies, including establishing bottled water and potable water distribution points. Priority customers need to be identified and notified; they may include but are not limited to fire departments and fire protection systems, hospitals, care facilities, disadvantaged populations, and potable water distribution points. As applicable, systems must also take necessary steps to contain contaminated water supplies.

Characterization and Assessment. During the first day of the break, it was not certain that MWRA would be able to maintain the water supply. Consequently, MEMA's Department of Fire Services worked to develop a plan to obtain water tankers for fire suppression, and communicated this plan with the metropolitan area fire chiefs. When it became clear that the MWRA response strategy would maintain water supply and system pressure throughout the incident, MEMA shifted their focus to augmenting potable water supplies. Governor Patrick ordered MEMA to manage the procurement and distribution of bottled water throughout the MWRA service area. He directed MEMA to provide water to everyone who wanted it (rather than to distribute water based on need). Some respondents questioned the need for this move, arguing that the boil water order and independent retail markets would have been sufficient to address potable water needs for all but disadvantaged populations who could not purchase and/or access their own water (e.g., the elderly, disabled, and low-income families who could not get to retail stores on their own). This question aside, it seems that the distribution of bottled water was one of the more challenging aspects of the Shaft 5A response.

Distribution of bottled water to more than two million people involves major logistical planning. MEMA was in charge of locating water supplies on a weekend, which was difficult because distributors were not open, and identifying warehouse facilities for emergency water distribution. Furthermore, distribution of water supplies to 30 Greater Boston communities posed unanticipated logistical problems. MEMA initially asked the National Guard to move the water from the staging areas to each community, but this was a slow process due to inflexible military procedures. Subsequently, MEMA asked each community's Department of Public Works to provide trucks to pick up the water – an approach that proved more efficient. The success of emergency water distribution in the service communities varied. Major traffic jams occurred in at least two towns, and there were reports in the media of concerns that people were taking more water than they needed, resulting in insufficient supplies for the elderly and other vulnerable populations. The City of Boston decided to distribute their bottled water supply only to those in need; although this alleviated traffic jams and water hoarding, it caused consternation among some residents who felt they should receive free water.

In retrospect, emergency water distribution is an issue that could benefit from ex post analysis and development of prioritization policies and emergency water distribution guidelines that balance concerns about equity, ease of distribution, and surety of adequate supplies at anticipated points of use. MEMA is investigating the possibility of contracting with a private distribution company, such as FedEx or UPS, to ship water supplies and use their warehouses as staging areas for water distribution during emergencies.

3.2.8 Action Area 8 – Perform Emergency Repairs

In addition to protecting public health and welfare, the utility must initiate emergency repairs or temporary mitigation actions to minimize system damage associated with an incident. Actions should focus on restoring service to priority customers or meeting priority demands (e.g., fire protection, hospitals, care facilities, and potable water distribution points). Communication with customers should include information on the estimated duration of repairs and disruption of service. Public health notifications must be reassessed and updated periodically.

Characterization and Assessment. MWRA's Engineering and Construction Departments were responsible for repairing the pipe. At the time of the break, MWRA was working with a contractor to rehabilitate the Hultman Aqueduct. After consideration of some other capable local contractors, the decision was made to retain this same company to perform Shaft 5A repairs, which meant MWRA did not have to spend substantial time identifying a contractor. In addition, the MWRA Contracts Office worked with the Engineering and Construction Departments to get a "rolling start" on contracting requirements applicable under an emergency situation (prior to an official declaration of an emergency by the Governor) so they could get the contractor working on the pipe repair as quickly as possible. Fortunately, the company had a suitable replacement for the broken coupling onsite locally. (A possible backup was also identified – the New York

Department of Environmental Protection and their contractor contacted MWRA to offer a suitable coupling that could be immediately trucked to MWRA and would take about four hours to arrive.) The crew was able to mobilize quickly and begin repairs as soon as the backup water system was operational. Repair crews proved very capable, and were able to improvise techniques to deal with site-specific repair and fabrication challenges. In addition, several respondents mentioned that MEMA fire marshals donated a Winnebago that served as an onsite emergency center. This enabled MWRA to study plans and make repair decisions in comfort and without concern about the weather. MWRA shut down the Shaft 5A pipe at 6:15 p.m. on Saturday and restored service by 6:15 a.m. on Monday.

3.2.9 Action Area 9 – Return System to Normal Levels

After control of the system has been regained, efforts should shift to restoring operations to normal levels. Damaged components should be permanently repaired or replaced. Use prohibitions and emergency restrictions on water use should be lifted only after measures have been taken to ensure the quality and quantity of water. Utility communication with stakeholders should include developing messages to explain the final stages of restoration work, address misperceptions or problems encountered during the emergency, and thank people as appropriate.

Characterization and Assessment. The key decision required to restore normal operations was the determination to lift the boil water order. This process was marked by innovation on the part of MWRA quality assurance technicians; cooperation among MWRA, DEP Drinking Water Program staff, and MDPH; and significant professional flexibility on the part of DEP in terms of accepting a sampling approach that could quickly and accurately indicate whether the backup water supply was safe to drink without being boiled. A pipe flushing plan was also developed and reviewed by DEP.

MWRA staff met with DEP staff on Saturday to begin developing water quality planning steps and establish criteria for lifting the boil water notice. They determined that coliform sampling would be required to demonstrate drinking water safety due to the use of the Chestnut Hill Reservoir, an open reservoir that is normally inactive. This was not a typical water quality sampling situation, since the water system had not been contaminated but was being tested to determine if onsite disinfection measures were adequate at Chestnut Hill. Together, MWRA and DEP staff decided to conduct two rounds of sampling per day, separated by eight hours, at sampling locations in all 30 affected communities, starting on Sunday, May 2, and continuing through Monday, May 3. (Additional rounds of testing would have been conducted on Tuesday, May 4, if necessary.) This meant that the communities collected, and MWRA and DEP tested, over 800 samples a day on the first two days – about the number of samples normally assessed on a monthly basis.

Another decision related to water quality sampling was the type of sampling method to use. Because of the large number of samples, DEP agreed that MWRA could conduct presence/absence tests for coliform and *E. coli*, rather than the numeric count method normally employed. DEP staff were in contact with EPA during this process to ensure the Agency approved the sampling approach used. The communities responded to the quick-turnaround request for water samples. By about 1:00 a.m. on Tuesday, May 4, samples from all but two communities had been analyzed, and by 6:30 a.m. all results were available. The bacterial results indicated very limited (two or three) total coliform positive samples and no *E. coli* positive samples on each day of testing. DEP, MDPH, and MWRA reviewed and discussed these results, and DEP determined, in consultation with MDPH, that it was safe to lift the boil water order. As one DEP employee stated, "the decision to lift the boil water notice became anti-climatic" by this time, since the sample results were revealing clean water and the pipe had been repaired the previous day.

3.2.10 Action Area 10 – Evaluate Response and Plan

An important part of an organization's ERP is the comprehensive and frank evaluation of actions taken during and after an emergency event. Until an incident actually occurs, the actions outlined in a utility's ERP are based on secondary accounts and best practices in the field and may not reflect the realities and circumstances encountered by a utility during a particular incident.

Characterization and Assessment. Although MWRA leadership and staff feel that the Shaft 5A event was handled well, they nevertheless appear to have given considerable thought to aspects of the response that could have been approached differently and mentioned a variety of lessons learned from the event (see Section 4). MWRA conducted several unit-wide evaluations and held a post-event meeting with the 30 affected communities to obtain feedback on the incident. As a result of these assessments and their own experiences during the event, MWRA staff made several changes to their emergency response system including updating the Community Contacts Tracking application, training staff on the application, revising emergency staffing protocols, conducting a refresher Incident Command Systems (ICS) training session, and working with other response agencies on communication issues and bottled water distribution approaches. It is not clear if MWRA conducted a formal, comprehensive assessment of their response. In their incident report to DEP, MWRA concludes that revisions to their "big-picture" ERP and EAPs are not needed.

3.2.11 Action Area 11 – Revise Plan

A water system's ERP should be viewed as a "living document." Based on the evaluation process described under Action Area 10, the plan should be revised and updated to reflect experiences and insights gained during an incident.

Characterization and Assessment. MWRA has an extensive ERP, including 166 EAPs for specific events, system components, and/or system liabilities. This plan seems broadly consistent with guidance established under Massachusetts Drinking Water Regulations 310 CMR 22.04 (13) and the Massachusetts Drinking Water Guidelines and Policies for Public Water Systems, Chapter 12 – Emergency Response Planning Requirements Guidance. There is a strong and pervasive sense among Shaft 5A responders that things were handled quite well. The event was discovered and qualified quickly; internal and external communications were timely and responsive; repairs were executed quickly; and water service was restored with a minimum of inconvenience to the public. MWRA emergency response staff, including the Executive Director, believe that because their ERP and EAPs focus on the broad steps involved in an emergency response, these plans do not require revision. Instead, the Authority has identified and is implementing more specific changes to their emergency response tools and training (as described in Section 3.2.10), and approved a significant acceleration of the capital program to complete rehabilitation of the Hultman Aqueduct.

3.2.12 Action Area 12 – Conduct Ongoing Training and Security Acculturation

The existence of ERPs, policies, and component- or event-specific protocols may send misleading signals of preparedness. If utility staff are unfamiliar with the mindful execution of their ERP or if they view emergency response as just another "government mandate" or an activity that interferes with the basic business of providing clean water to the public, individuals presumed responsible for executing the plan may actually come to "mock" the plan and associated response procedures. Instead, ERPs and protocols must be enveloped in a "living flesh" of related and supporting activities. Ongoing training is therefore essential to ensure that utility staff and response partners are familiar, comfortable, and fully acculturated in the utility's overall response approach.

Characterization and Assessment. From top to bottom, interviewees were of the opinion that the Shaft 5A response was well executed because of MWRA's ongoing and pervasive emphasis on emergency planning and response drilling. Previous research conducted by Stratus Consulting for WaterRF suggests that MWRA may be a model utility when it comes to security, emergency planning, and emergency operations.

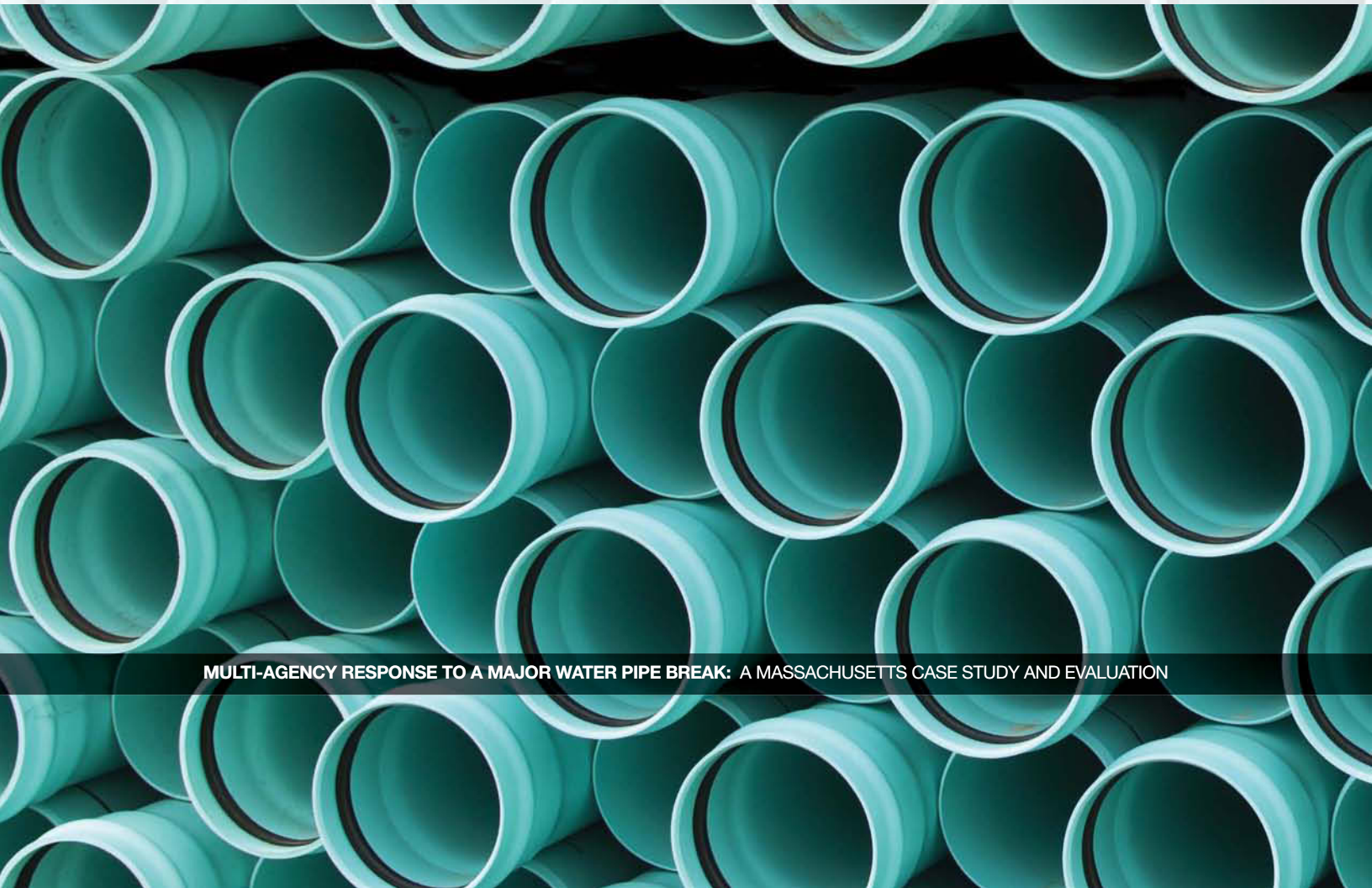
MWRA conducts major emergency response drills once a year with multiple tabletop sessions and specific drills throughout the balance of the year. In addition, they frequently "embed" emergency response drills, training, and debriefings into routine activities. For example, a crew making a routine repair might be instructed to execute the job using a backup power generator (rather than normal circuit power) to ensure that they are familiar with the generator's operation, that the generator is working properly, and that security is in the forefront of staff thinking. Similarly, a crew might be asked to use the mobile disinfection units for routine rather than emergency use to improve their proficiency. Furthermore, MWRA has a policy of opening and

manning their EOC for all forecasted major storms and during major operations. This helps familiarize staff with EOC operations and response procedures. Likewise, the state agencies and Boston agencies that were involved with the Shaft 5A break also emphasize emergency response training and drilling activities. For example, the City of Boston conducts drills throughout the year and has developed an "All Hazards Plan" that presents ERPs for a wide range of scenarios and consequences and contains an Emergency Public Information Annex on communication methods.

MWRA has evolved a strong and vibrant culture of security. This is a rare and impressive phenomenon. We encourage MWRA to continue their emphasis on security planning, training, and drilling, perhaps emphasizing aspects of the Shaft 5A response that were affected by good fortune.

Section 4

Case Study Conclusions



4. Case Study Conclusions

Overall, MWRA and their partner agencies handled the response to the Shaft 5A pipe break effectively and efficiently. A potentially major disruption in water service to two million people was averted; the broken pipe was repaired and a boil water order lifted within three days. Interviews with members of responding agencies and organizations and media content analysis show a high level of satisfaction with the response.

This case study identified examples of both best practices and unexpected challenges. The following observations, success stories, lessons learned, and themes were synthesized from our research and the assessment presented in Section 3. Summarized in Exhibit 4.1, these findings cover aspects of emergency response for which MWRA and their response partners serve as models to other drinking water utilities. They also demonstrate problems that can arise even when the response team has planned and trained for emergency events, and the lessons learned from these challenges.

Exhibit 4.1. Summary of case study observations, lessons, and themes

Emergency planning and preparedness

- *Develop a pervasive and vibrant security culture* by treating normal incidents as drills, conducting frequent drills and training, emphasizing both emergency response planning and mindful response improvisation, and reviewing and revising the ERP and program after every emergency event.
- *When assessing a recent emergency response, identify the actions that succeeded due to good fortune*, assess how the incident might have been handled differently if events had unfolded differently, and use these alternative possibilities as training exercises.
- *An emergency response is only as good as its weakest link*. When developing planning materials and conducting drills, make sure to include (or at least consider) all potential response partners. Identify weak links in the response system and focus effort on these concerns.

Emergency response

- *Engage in the practice of "pulsing"* – getting small bytes of initial information out the door quickly – during both routine and emergency situations.
- *Ensure that a sufficient number of support staff is brought in during an emergency response* and directed to help with handling housekeeping and administrative functions, thus enabling senior management and/or technical staff to focus on the response.
- *The need for responder rest and stress management is well documented* in emergency response and should be addressed during emergency planning protocols, training, and drills.

Exhibit 4.1. Summary of case study observations, lessons, and themes (cont.)

Organizational issues

- *Develop a strong EOC/incident command*, including succession of authority and responsibility, to ensure smooth and efficient emergency response.
- *Nurture relationships before an event, not just during an event.* MWRA's experience illustrates the importance of developing strong, trusting relationships with potential partners before an emergency occurs (e.g., during drills and other emergency and non-emergency situations).
- *It is important to balance the importance of emergency plans, procedures, and command structures with the need for improvisation and mission flexibility.* As illustrated by MWRA's experience, an effective response requires mindful improvisations and response flexibility.
- *Assess existing drinking water distribution protocols.* Although a seemingly straightforward issue, a variety of problems can arise, including procuring bottled water on weekends, hoarding water, and ensuring access to disadvantaged populations.
- *Strong leadership can be critical.* The Shaft 5A incident provides a valuable model for the successful involvement of strong, hands-on leadership.

Communication practices

- *Adopt a philosophy of frequent and varied communication and transparency.* In many ways, the high degree of response transparency practiced by MWRA during the Shaft 5A incident enabled the media to become a literal partner in the emergency response.
- *Electronic communication is essential, but its use creates a new set of issues and problems*. Water utilities should develop and regularly maintain contact information (including email addresses and cell phone numbers). It is also important to develop strategies for using non-cellular capabilities and protocols.
- *Develop notification templates in advance*. Emergency response guidance typically recommends the development of boil water orders and community advisory templates prior to an actual emergency. Nevertheless, even with pre-existing language and templates, MWRA and their partners found that drafting event-specific language was a significant and time-consuming challenge.
- *Review potential risk communication issues related to various emergency situations.* For example, one issue that arose after the Shaft 5A incident was the extent to which MWRA should explain the rationale behind issuance of a boil water order.

The best practices and lessons learned presented in this section are organized into four topical areas: (1) emergency planning and preparedness, (2) emergency response, (3) organizational issues, and (4) communication practices.

4.1 Emergency Planning and Preparedness

Importance of a "Security Culture." A security culture is a set of values, procedures, and informal outlooks that are held in common by all or most members of a group or organization. A security culture is actively focused on the identification and minimization of risk. It corresponds with a work environment in which security and emergency preparedness issues are taken very

seriously and addressed as an element of day-to-day operations. Based on interviews, media accounts, and review of archival material, MWRA has a pervasive and vibrant security culture that should be emulated by other water utilities. Beyond specific emergency response practices and procedures, MWRA's security culture contributed significantly to the utility's ability to mindfully and effectively respond to the Shaft 5A break. This security-focused outlook is maintained and bolstered through practices such as the following:

- *Conduct emergency response planning.* DEP requires water utilities to develop ERPs and provides guidance for developing the plans. In comparison to other water utilities, MWRA has created an impressively comprehensive ERP, including 166 action plans for specific events and/or system components. One of these EAPs covers the area where the Shaft 5A break occurred, and MWRA had conducted an earlier training exercise based on this EAP.

- *Emphasize drills and training.* MWRA conducts frequent drills, tabletop exercises, and coordinating meetings, both within the utility and in conjunction with other state and local agencies and organizations. They treat each drill as a serious, carefully crafted event that is designed to create confusion, require individuals to think critically, and force individuals to make decisions. MWRA drills and training exercises emphasize problem-solving and "mindful" response to emergency scenarios. In fact, MWRA had conducted two practice drills in the recent past to activate the Sudbury Aqueduct – an activity that was required during the Shaft 5A incident.

- *Treat normal incidents as drills.* MWRA has a well-established practice of embedding emergency response actions within routine activities. The idea is to turn everyday events into a sort of drill and, after each "event," to debrief participants on lessons learned and things that might have been done differently. This approach helps prepare MWRA for real emergencies.

- *Learn the ERP, but also emphasize the critical importance of mindful response improvisation.* No plan is etched in stone because no emergency occurs exactly as planned for. Thoughtful planning, training, and drills help the response agency get started in the event of an emergency and help teach strategic thinking about how to respond to unexpected events and problems. When they participate in emergency drills and exercises, MWRA staff are encouraged to "ask questions, not just slavishly follow the plan." Multiple MWRA employees commented that the Shaft 5A response "felt just like a drill."

- *Review and revise the ERP, incident command structure, and associated emergency protocols, tools, and training after every emergency event.* A formal, all-participants review of the utility's ERP and associated protocols is essential after each event, whether

small or large. Every water system should take the opportunity of any unusual event to re-evaluate their plans and performance.

Good Fortune Can Play a Role. Nearly all responders to the Shaft 5A incident readily acknowledge that part of their success in responding to the Shaft 5A incident was due to good fortune. For example, MWRA already had the "right" contractor working at a nearby site, as well as others available if needed. This contractor had an onsite replacement for the broken coupling, reducing the time required to get one from another source (which was quickly identified as a backup). MWRA was able to open an old, stuck valve on the Hultman Aqueduct, and thus did not need to implement some of the more difficult steps in their emergency plans. Although the break occurred on the first beautiful Saturday of the spring, all the key responders (i.e., MWRA senior management) were in town and available during the weekend of the pipe break (although it should be noted that MWRA routinely runs training drills with key staff pulled out of service). The break was located in an area that was easily accessible by the MWRA repair crew. The water was never contaminated. It was also "lucky" that response agencies had recent opportunities to work together due to other major emergency events, such as severe floods in March 2010 and ice storms in 2008, and had used those events as training opportunities.

When reviewing a past emergency response, it is essential for utilities to look at what went right, as well as what went wrong, and to plan for "less fortunate" emergency situations. For example, if the Hultman Aqueduct valve did not open or the Chestnut Hill Reservoir was contaminated, water supplies could have been very limited and water conservation plans would have been required, as laid out in the emergency plan. Agencies should assess how the incident might have been handled differently if events had unfolded differently. How would the incident command structure have been different if different staff were available? What if the failure had been more severe? What if key repair or response components were unavailable? These questions can provide scenarios for future training sessions.

An Emergency Response is Only as Good as the Weakest Link. Other than Boston, the communities affected by the water break are relatively small, have limited budgets, often have only one full-time or part-time employee or volunteer available to work on emergency issues, and appear to conduct less frequent drills or extensive emergency preparations. During the Shaft 5A incident, MWRA customer communities were responsible for emergency notification, ongoing communication, bottled water distribution, and taking an extraordinary number of water samples in a short period of time.

Because we were able to interview only a few community responders and media reporters for this case study, it is difficult to develop specific conclusions about the success of the 29 smaller cities and towns in responding to the Shaft 5A incident. Overall, however, it appeared that many communities rose to their numerous challenges, with some cities and towns excelling in some areas and others performing less well. Although MEMA requires all towns to develop All Hazards Plans, it is not clear that all of MWRA's customer communities share the Authority's

culture of security to the same degree. Some communities did not have a plan for emergency bottled water distribution and experienced long lines and traffic jams. Communities were also sometimes confused by the boil water order requirements and closed down restaurants unnecessarily. Many of the affected communities had reverse 911 systems for alerting residents to the break, but not all of these systems worked as planned. (It is noteworthy that several communities have since used the event as an opportunity to upgrade their systems.)

On the other hand, as described in Section 2.2, local health departments or boards of health, departments of public works, fire departments, and police departments played an active role in the response. Communities provided information through their websites and reverse 911 systems, offered public bottled water distribution, provided basic information regarding the boil water order, and even knocked on the doors of senior citizens and visited public housing complexes to ensure those residents had bottled water. In addition, some communities posted notices on their public access television stations. Perhaps most importantly, all of the communities conducted the extensive required water sampling and almost all were able to deliver their samples on time to MWRA.

The Shaft 5A event demonstrated the important role that communities play in an emergency. Even if a water utility is able to contact all affected communities, the towns themselves must be able to reach their residents, restaurants, hospitals, and schools and provide necessary advice and services. The Shaft 5A event suggests that drinking water utilities and their response partners (including MWRA, MDPH, MEMA, and other Shaft 5A responders) could enhance the overall system security and emergency preparedness by providing more high-level guidance for local communities (e.g., on water distribution planning and how to assist restaurants in continuing their business during a boil water order), and putting additional effort into training communities and sharing best practices. In addition, local boards of health could be encouraged to develop plans or assess and revise existing plans to support restaurants and other food facilities during emergency events.

A possible funding option for large urban areas such as Boston to conduct regional emergency planning might be to apply for a grant under FEMA's Urban Areas Security Initiative (UASI). The UASI program focuses on enhancing regional preparedness among public and private community representatives, state and local government agencies, and Citizen Corps Councils in major metropolitan areas.[2]

2. See Fiscal Year 2010 Homeland Security Grant Program website: http://www.fema.gov/government/grant/hsgp/index.shtm#2.

4.2 Emergency Response

Engage in the Practice of "Pulsing" – Getting Small Bytes of Initial Information Out the Door Quickly. Human factors researcher James Reason developed a convincing argument that a safety or security culture is also an "informed culture" (Reason, 1998). An informed culture is one in which those who operate a system have current knowledge about the human, technical, organizational, and environmental factors that impact the safety of the system as a whole. Consistent with this emphasis on seamless communication regarding system status and condition, MWRA has evolved a communication practice called "pulsing." Pulsing involves frequent, short meetings, messages, or conversations in which factual updates are shared. The point is not to solve problems but merely to pass on information as quickly and efficiently as possible. Staff are encouraged to share information "as is," not to try to interpret, analyze, or augment what is known. MWRA utilizes this practice in both routine and emergency situations, frequently by means of Blackberry text messaging.

Have Adequate Support Staff at the EOC and Other Locations. Incident commanders and emergency response decision-makers should focus only on the "big stuff" and not be distracted by administrative chores. Several members of the core MWRA response team offered the lesson that an emergency response team should include more people to simply be "on hand" throughout an emergency to take care of housekeeping and administrative functions. Such individuals could answer phones, drive responders to and from meetings, purchase food and supplies, answer cell phones, and perform other tasks. Successful implementation of this approach will include (1) revising ERPs to include notification and activation of support staff at the same time that other key staff are mobilized, and (2) training management and senior staff to identify, direct, and use assistants to assist them during an emergency.

Responder Rest and Stress Management. Responder exhaustion and stress management have long been recognized as key factors in emergency response execution. It is not uncommon to hear of emergency responders who work past their physical limits, become sleep-deprived, and suffer impaired judgment. Although the Shaft 5A incident did not last as long as other major emergency situations,[3] it nevertheless resulted in some cases of staff exhaustion. Several interviewees cited the need to arrange for and get adequate rest as a "lesson learned" from this event. Some respondents also indicated that because they were so involved and invested in the emergency response they did not want to leave the site. Responder exhaustion is a well-recognized phenomenon and should not catch responders by surprise; emergency planning protocols and drilling scenarios must address the need for stress management and rest.

3. During the 2005 response to Hurricane Katrina, some response teams were in the field without relief for upwards of one week.

4.3 Organizational Issues

Develop a Strong EOC/Incident Command. On the whole, the multi-party response to the Shaft 5A break was smooth and efficient. The MWRA executive team, Office of the Mayor, MEMA, and Governor worked well together. The key response team members met soon after the break was discovered and implemented a command structure, where the Massachusetts Governor would be in charge of state operations, the Boston Mayor would be in charge of the city's operations, MWRA's Executive Director would be in charge of coordinating the Authority's operations with the state, and the MWRA Chief Operating Officer would be the Incident Commander for MWRA. Many interviewees indicated that this structure was not only sufficient but a key underpinning to the success of the response. However, a small number of respondents were confused as to who they were supposed to report to during the event and/or commented that the MWRA structure might be improved with a more formalized approach.

In terms of cross-jurisdictional emergency response, the greater Boston area enjoys many positive characteristics, including (1) strong security cultures within agencies, (2) well-trained staff, and (3) excellent interagency relationships. These traits, combined with an effective incident command structure, appear sufficient for the region to deal with most types of emergencies. Water utilities should bear in mind that disaster response coordination is inherently difficult. They should investigate ICS approaches such as the FEMA ICS[4] and develop an explicit and robust system of emergency command, control, and communication. This should include designation of a Public Information Officer, who is in charge of coordinating all external communication to ensure consistency.

Nurture Relationships Before an Event, Not Just During an Event. The emergency response literature (see Appendix D) emphasizes the need to build trusting relationships with potential partners before an event. The Shaft 5A response was facilitated by a set of strong, trusting relationships among responders. Colleagues in different agencies and departments knew what to expect from one another and were comfortable in collaborative roles. This focus on collaboration was exhibited within MWRA but also occurred at the larger, inter-agency scale. Thanks in part to the involvement of the Governor and the Mayor of Boston, the various state and local agencies moved easily into designated roles and maintained effective communication among all the players. Nonprofit organizations also played a role in the collaboration, although this is an area that could be strengthened and formalized. One reason for success was that agencies and organizations in the state and the City of Boston (including the Governor and Mayor) had already worked together in drills and other emergency and non-emergency situations (e.g., recent severe flooding), where they developed trust, mutual respect, knowledge of one another's systems and capabilities, and communication practice familiarity. This approach to building

4. FEMA provides background and references pertinent to the development of an ICS (FEMA, 2010).

strong relationships serves as a model for emergency responders in other parts of the United States.

The Importance of Response Improvisation and Mission Flexibility. Although we have emphasized the importance of emergency plans, procedures, and incident command structures, the Shaft 5A response benefited from mindful improvisations and response flexibility. For example, DEP worked with MWRA to devise innovative and appropriate water sampling protocols. DEP was willing to forgo certain procedures in order to lift the boil water notice more quickly – because they were convinced that the revised sampling approach was appropriate, and trusted MWRA to carry it out. As another example, flexible contracting approaches were adapted to address the emergency situation (prior to official declaration of an emergency by the Governor) so that the contractor could begin pipe repair as quickly as possible. Perhaps most importantly, response agencies quickly and easily established roles and areas of responsibility, resulting in an effective overall response. When conducting emergency training, it is critical to emphasize mindful response, not rote learning of static plans or other protocols.

Reconsider Emergency Water Distribution Protocols. Bottled water distribution was an area of confusion, inconsistent approaches, and – in some cases – an apparent lack of planning and forethought. Governor Patrick was not willing to rely on the retail market and the boil water order for drinking water, and so directed that bottled water be made available for all citizens. Consistent with their existing practice, the City of Boston distributed water only to populations with specific functional needs (e.g., elderly or disabled citizens). Other customer communities adopted a range of distribution philosophies and approaches. This resulted in some concern with respect to identifying sufficient supplies of bottled water, as well as water hoarding and lack of access for the elderly, disabled, and others who could not get to distribution points. To avoid problems in future emergencies, MWRA, BWSC, MEMA, the City of Boston, and other partners should review and revise their bottled water and tanker (or other bulk water) acquisition methods and their prioritized distribution and water conservation protocols based on the lessons learned during the Shaft 5A incident. While MEMA had plans and purchasing arrangements in place that have been effective in smaller incidents, the scale of this event was larger than previously experienced. In fact, MEMA has already begun to develop a more robust plan to acquire and distribute bottled water to communities.

The confusion over bottled water distribution demonstrates that challenges can arise even when responders have attempted to plan for them. It is important for all water utilities to review their water distribution and other emergency response activities with an eye toward different types of emergencies and scales of potential events.

Strong Leadership Can Be Critical. The Shaft 5A incident benefited from the involvement of at least three knowledgeable, hands-on, strong leaders: Massachusetts Governor Deval Patrick, Boston Mayor Thomas Menino, and MWRA Executive Director Fred Laskey. These individuals shared “ownership” of the event and worked well together to coordinate the response. All three

were effective at bridging potential stovepipes within their organizational purview. We could discern no evidence of "turf" issues that could have complicated the multi-jurisdictional response effort. Although it might not be most appropriate for every water utility jurisdiction, the Shaft 5A incident provides an excellent model for a strong, top-down leadership approach.

4.4 Communication Practices

Adopt a Philosophy of Frequent Communication and Transparency. MWRA and other response agencies clearly adopted a philosophy of transparency and frequent and varied types of emergency notification and communication regarding this incident. Media sources confirm that MWRA did an outstanding job of providing information, quickly addressing questions, and allowing access to officials and the emergency site. Especially in the first crucial hours of the event, the local media and response agencies worked in partnership to alert citizens about the event and provide instructions and guidance. In many ways, the high degree of response transparency enabled the media to become a literal partner in the Shaft 5A response.

Electronic Communication is Essential, but its Use Creates a New Set of Issues and Problems. In an age of cell phones and Blackberries, it is difficult to maintain up-to-date phone and email records. Individuals frequently change email addresses or cell phone numbers, and it takes a concerted and ongoing effort to keep track of these changes. According to some respondents, community leaders and restaurants were both particularly difficult to contact. Problems with reverse 911 systems occurred partly as a result of difficulty maintaining emergency contact lists with up-to-date cell phone numbers, and partly because not all reverse 911 vendors provide the comprehensive, high-volume services required in an emergency such as the Shaft 5A break. MWRA, their partners, and other water utilities may need to revisit their response plans and update emergency contact lists to address the types of problems that occurred during the Shaft 5A break. For example, MWRA had started to create a Community Contacts Tracking computer application before the Shaft 5A break, and completed the application and trained on it after the emergency. This will serve as an updatable database to use when contacting people in subsequent emergency and non-emergency situations.

In many organizations, Blackberries or other "smart phones" have become the default option for communication (providing constant email contact). However, users must keep their chargers with them and have access to outlets or they are useless, a situation that was slightly problematic during the Shaft 5A incident. Although Blackberry use proved to be a strong asset during the Shaft 5A response, its absence (or even limitation) due to service disruptions or other problems could constitute a profound and crippling liability in other situations.

Many recent disaster situations have involved full or partial cellular service outages, sometimes for extended periods of time. Consequently, water utilities need to critically reflect upon reliance on electronic communication technologies, including a review of the adequacy of non-cellular

communication capabilities and protocols (e.g., text communication, 800 mHZ radio systems).[5] Similarly, it is important to include non-cellular communication modes during selected routine operations and to focus drills on situations that involve lengthy cell outage.

Advance the Development of Notification Templates. Many interviewees spoke of challenges associated with the development of notification and guidance materials. Although interviewees confirmed that they had pre-existing language and templates, they nevertheless count the revision and agreement on event-specific language as a time-consuming challenge. Part of this difficulty was due to initial differences between MDPH and BPHC regarding the content of their communications, specifically, whether un-boiled water could be used for hand-washing. Other challenges stemmed from the fact that some of the guidance materials used as templates had been developed for events that entailed water contamination or for a reduced scale.

It is not possible to have a template prepared in advance for every possible scenario. However, a key lesson learned is that water utilities should recognize how difficult and time-consuming it can be to revise guidance materials (and emergency websites) during an emergency event. Consequently, it is important to review stock templates and guidance documents periodically and after every incident (no matter how small), brainstorm on contingencies and issues not covered by these materials, and make revisions and/or new templates, as appropriate. This includes, for example, templates with messages appropriate for a wide range of types of emergencies (e.g., contaminated vs. uncontaminated water scenarios), affected groups (e.g., instructions for restaurants, health care facilities, schools, and nursing homes), and scales of events (e.g., events affecting one community, an urban metropolitan region, and a rural region). Review of the text by a designated Public Information Officer could help assure that language is consistent and help avoid concerns of miscommunication during an emergency.

Risk Communication. As demonstrated by the water sampling results, water from the Chestnut Hill Reservoir was well chlorinated and safe to drink during the entire emergency. In addition, only a small portion of the water supplied to the 30 communities was actually from the emergency backup system; the remaining water was from the MetroWest Tunnel (via a segment of the Hultman Aqueduct) and so was always fully treated. In hindsight, some media coverage and some interview respondents questioned the decision to issue a boil water order. Nevertheless, most participants and observers remain adamant that a precautionary approach was not only required by their policies and by law but was also the most appropriate response. Issuance of the boil water order provided clear and unambiguous directions to the affected community, erring on the side of safety.

Another example of an important risk communication issue relates to concerns about the emergency water distribution process. For example, some interviewees noted that it was difficult

5. MWRA staff indicate that they are currently reassessing the capabilities of their existing radio system and their limited number of satellite phones.

to convince people to boil their water rather than to take advantage of the free bottled water. Successful communication might entail explaining that disabled populations need to receive first priority, that boiled water is just as safe as bottled water, and that overuse of water distributed in plastic bottles is an environmental concern.

The Shaft 5A break illustrates the importance of carefully considered risk communication and provides an opportunity for MWRA and other responders to analyze their decisions and develop recommendations for future incidents.

Appendices

A. In-Person and Telephone Survey Respondents

City of Boston

- Barbara Ferrer, Executive Director, Public Health Commission
- Justin Holmes, Director of Constituent Engagement
- Jim Hunt, Chief, Environmental and Energy Services
- Don McGough, Director of the Mayor's Office of Emergency Management.

Commonwealth of Massachusetts

- Ian Bowles, Secretary, Executive Office of Energy and Environmental Affairs
- Suzanne Condon, Associate Commissioner, Director of the Bureau of Environmental Health**,** Massachusetts Department of Public Health
- Paul Niman, Emergency Response Coordinator Drinking Water Program, Massachusetts Department of Environmental Protection
- Kurt Schwartz, Acting Director and Emergency Operations Chief, Massachusetts Emergency Management Agency
- Dave Terry, Drinking Water Program Director, Massachusetts Department of Environmental Protection
- Eric Worrall, Drinking Water Program, Massachusetts Department of Environmental Protection.

Communities

- John Bean, Director of Public Works, Arlington
- Steve Swymer, Superintendent, Department of Public Works, Winchester.

Massachusetts Water Resources Authority

- Fred Brandon, Senior Program Manager, Director of Water Engineering
- Ria Convery, Director of Communications
- Steve Estes-Smargiassi, Director of Planning
- Joseph Favaloro, Executive Director, Advisory Board
- Dave Gilmartin, Director of Emergency Preparedness, Planning, and Training
- Mike Hornbrook, Chief Operating Officer
- Mark Johnson, Director of Metro Operations
- Marcis Kempe, Director of Operations Support
- Fred Laskey, Executive Director
- Victor L'Esperance, Manager of Security and Emergency Planning
- Mike Morris, Director of Public Affairs

- A. Navanandan, Director of Construction
- Betsy Reilly, Senior Program Manager, Quality Assurance
- Steve Rhode, Laboratory Section Manager, Deer Island.

Media

- Noah Bierman, Boston Globe
- Member of the regional news media.

B. Massachusetts Water Resources Authority Shaft 5A Pipe Break Interview Guide (November 8 and 9, 2010)

Background Information – All

1. Name:_____
2. Title:_____
3. Organization: _____
4. Phone: _____
5. Email:_____

Overview of Role in the Water Main Break Emergency – All

To get started, we'd like to ask a few questions about your general role and your agency's role in responding to the Shaft 5A break.

1. In just a couple of sentences, can you tell me what the overall role of your organization was in responding to the Shaft 5A break? **(OPTIONAL)**

2. In just a couple of sentences, what was your overall role in the response?

3. To help us focus our interview discussions, we have chosen to structure our questions around a two-tier framework for describing emergency response. **SHOW EXHIBIT 1.** We have identified the following response categories and action areas…which of these were you involved in during the response to the Shaft 5A pipe break? Did we miss any key emergency response categories or action areas?

4. Who did you report to during the event?

5. Who did you give directions to during the event?

6. Were you or your agency involved in making key decisions necessary to the emergency response? If so, what were they?

Initial Response – All

We'd like to start by asking about the initial hours of the pipe break.

1. How did you (and/or your organization) learn of the break? **(*recognize status changes*)**

2. When did you learn of it? **(*recognize status changes*)**

3. What initial response actions did you (and/or your organization) take? For each initial response action, please describe the action, when the action was taken, and who was responsible for the action (probe for specifics on how they: ***mobilized staff, set up Emergency Operations Center, activated external communications, analyzed type and severity of event, assessed leak, assessed repair options*).**

4. What problems, if any, did you encounter during these initial response actions? How did you address these concerns?

5. Which response actions went smoothly? Why?

Emergency Response Actions – As Appropriate

1. We'd like to walk through the <u>emergency response actions</u> that you/your organization took over the course of the water pipe break event. Please describe each action taken, when it was taken, and who was responsible for each action:

[*Determine the appropriate specific response/recovery actions, recommend or issue needed directives* (reduce water use, stop water use, boil water notice, lift boil water directive), *implement the appropriate response/recovery actions* (initiate water backup system, water distribution, emergency repairs), *assess/address health and safety threats*.]

a. What redundancy plans were in place to ensure backup water in case of a water pipe break?

b. What problems, if any, did you encounter during these response actions? How did you address these concerns?

c. Which response actions went smoothly? Why?

Internal and External Communications – As Appropriate

1. **We'd like to walk through the communication actions that you/your organization took over the course of the water pipe break event. Please describe each action taken, when it was taken, and who was responsible for each action:**

Probes: Activate EOC??, communicating with staff, communicating with other response organizations/agencies, communicating with the public and other stakeholders; notification methods [web sites; "dark" site (a dedicated emergency response site that can be activated when needed); TV/radio, phone calls, emails, reverse 911, Health and Homeland Alert Network, 211; computerized emergency notification system] pre-existing templates [did you have any pre-existing templates that you used during the emergency response (e.g., stakeholder lists, Boil Water Notice wording, …)], timing of notifications, coordination with other agencies, dissemination of information on emergency actions taken and progress, effective and accurate wording of messages.

a. What problems, if any, did you encounter during these response actions? How did you address these concerns? (**Probe**: were drinking water requirements clear to stakeholders for example, "boil water notice" vs. "boil water advisory" vs. "boil water order;" safe uses of boiled vs. tap water; how to flush water system after boil water advisory ended. how long did it take to get notification to stakeholders? How did you ensure that people who are low-income and/or do not have access to computers received notice of the problem? Were there problems getting hold of all 30 affected communities?)

b. Which response actions went smoothly? Why?

Ensuring Water Quality – As Appropriate

1. **We'd like to walk through the water quality actions that you/your organization took over the course of the water pipe break event. Please describe each action taken, when it was taken, and who was responsible for each action:**

(**Probes:** *Preserve and ensure safety of stored water/identify alternative water sources, assess/address health and safety threats. This would include water sampling criteria and approach, gathering information on whether a Boil Water Order was needed, deciding when to lift the order, providing input on water flushing requirements.*)

a. What problems, if any, did you encounter during these response actions? How did you address these concerns?

b. Which response actions went smoothly? Why?

Pipe Repair – As Appropriate

1. We'd like to walk through the <u>pipe repair actions</u> that you/your organization took over the course of the water pipe break event. Please describe each action taken, when it was taken, and who was responsible for each action:

(**Probes:** *Perform emergency repairs based on priority of demand, return system to normal levels.*)

a. What problems, if any, did you encounter during these response actions? How did you address these concerns?

b. Which response actions went smoothly? Why?

Emergency Response Plan Development, Maintenance, and Training – As Appropriate

We'd like to walk through the emergency planning and training actions that you/your organization followed prior to and after the pipe break.

1. In terms of emergency response planning:

(**Probes:** *Evaluate response and plan; revise plan.*)

a. Does your agency have an emergency response plan that covers this type of emergency? ___ (OPTIONAL)

b. May we have a copy? (OPTIONAL)

c. Does your plan include an emergency *communication* plan? If so, was it useful? Did you follow it? Would you change it based on this experience?

d. Does your plan include a *business continuity* plan (avoidance of overall service disruption, thresholds for service disruption)? If so, was it useful? Did you follow it? Would you change it based on this experience? (*Probe: Would this have been helpful for restaurants that had to deal with boiling water?*)

e. Have you and/or your organization conducted an assessment of your response to the Shaft 5A break? ___

f. If yes, please describe the steps you have taken.

g. If no, do you plan to assess your response in the future? Please explain your plans.

h. Have you made or do you plan to make revisions to your emergency response plan based on the Shaft 5A experience? Please describe the changes you think would improve the plan. (*Probe: Were there aspects of the event that necessitated improvisation or departure from the written emergency response plan or protocols?*)

2. Conducting training/drills to reinforce lessons learned

(**Probes:** *Conduct ongoing training/security acculturation.*)

a. Has your organization conducted scenario development exercises, drills, table top exercises, and/or training that proved to be relevant and helpful when dealing with the water main break event? (*Probe: Tell us about the water pipe break training session from 2006.*)

b. Were they useful when responding to the Shaft 5A break? Why or why not?

c. Have you assessed the need to revise existing training and drills as a result of lessons learned during the Shaft 5A pipe break?

d. If so, please explain the changes you have made or plan to make.

Relationship of Response to Emergency Response Plan – All – If Not Already Covered

1. Did you conduct your response activities in accordance with the steps described in your organization's emergency response plan? _____

2. Was the emergency response plan helpful to you during the event?

3. Did you refer to your written plan during the emergency? Was it easy to find? Was it usable? Did you have (or need) a "rip and run" version? Blackberry version?

4. Were there aspects of the event that necessitated improvisation or departure from the written emergency response plan or protocols?

5. What aspects of the plan and planning process were most helpful?

6. Which aspects of the plan and planning process could be improved in order to be more helpful the next time around?

Coordination and Communication with Other Emergency Response Organizations – All – If Not Already Covered

1. Did you coordinate with other organizations during the emergency response process? Which ones?

2. Did these coordinated response actions occur under formalized mutual assistance agreements? If yes, what do they cover? If no, were other (more informal) plans or protocols in place to ensure and define areas of coordination with other responders?

3. Did you experience any problems coordinating with other responding agencies? In what ways?

4. What aspects of coordination were the most effective? Why?

Conclusions – All

1. Overall, what were your two or three biggest challenges during the emergency response process? Why? How did you overcome or attempt to overcome them?

2. Overall, what do you think were the main elements of success? Why?

3. Do you have any other comments to add or topics that we may not have asked?

CAN WE GET BACK TO YOU IF WE HAVE ADDITIONAL OR FOLLOW-UP QUESTIONS?

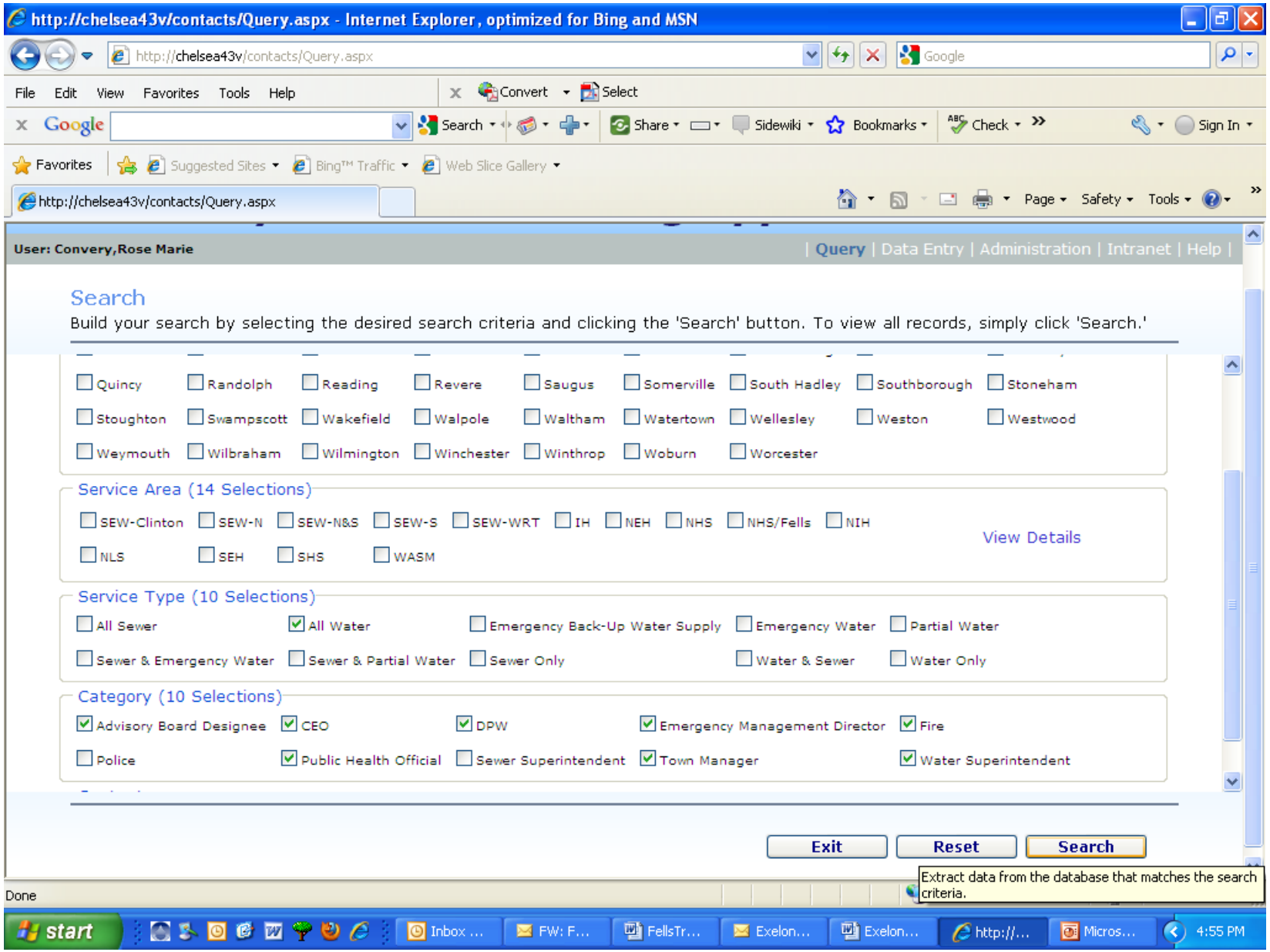
THANK YOU VERY MUCH.

C. Sample Guidance, Notices, and Other Documents

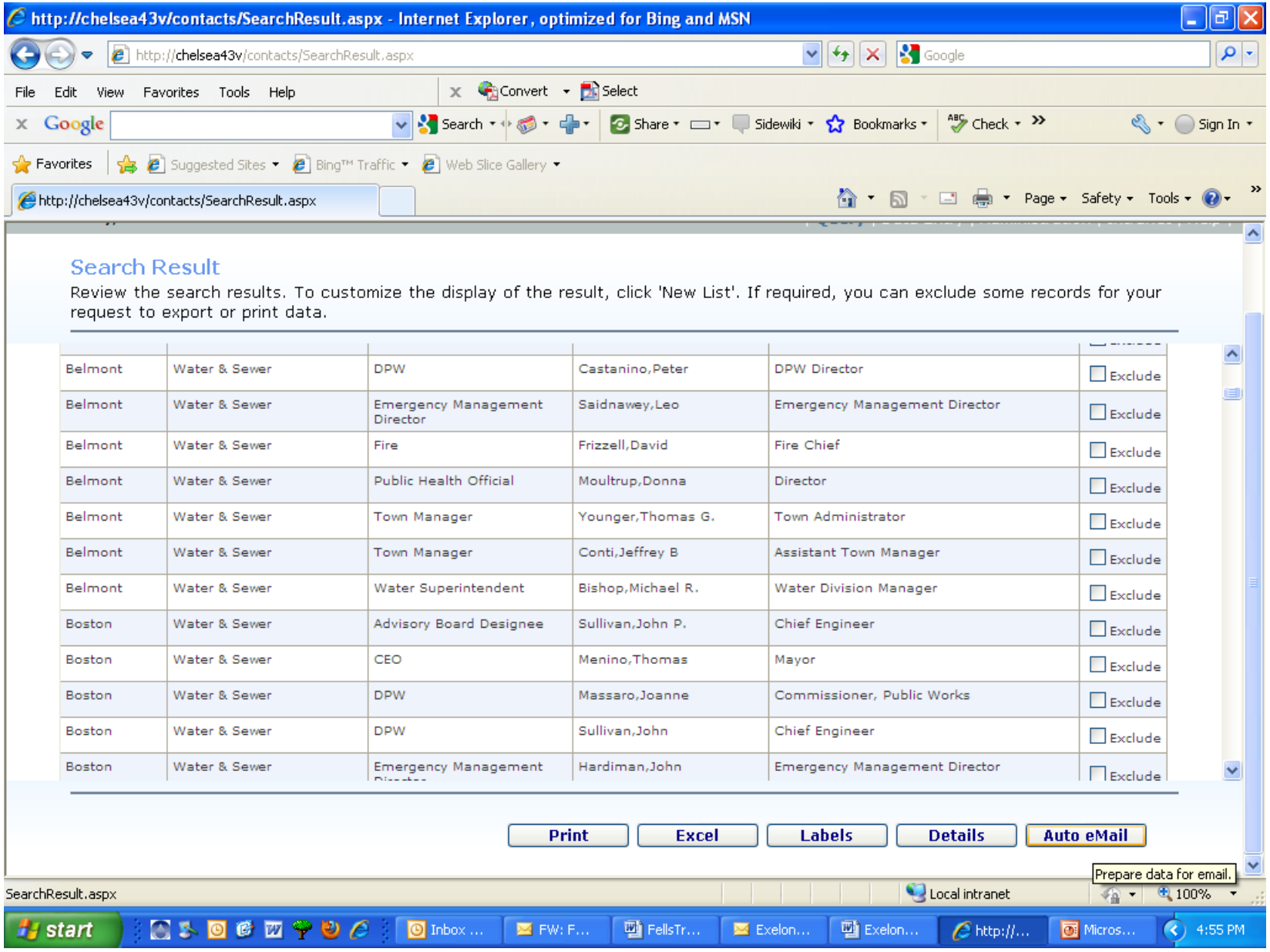
C.1 MWRA Community Contacts Database
C.2 DEP Boil Water Order Fact Sheet
C.3 MDPH Boil Water Order Frequently Asked Questions
C.4 MDPH Clinical Advisory to Massachusetts Health Care Providers
C.5 MDPH Emergency Guidelines for Food Establishments
C.6 Boston Water and Sewer Commission Special Advisory
C.7 City of Boston Tips for Restaurants during a Boil Water Order
C.8 Boston Public Schools Press Release
C.9 City of Boston, Mayor's 24-hour Constituent Engagement Call Center Script
C.10 City of Boston Emergency Notification Messages
C.11 MWRA Archived Website – Documents Related to Shaft 5A Pipe Break, May 2010
C.12 MWRA Water Main Break Requires Boil Water Order
C.13 MWRA Community Updates
C.14 Governor Patrick Lifts Boil Water Order for All 30 MWRA Communities, Press Release
C.15 MDPH Instructions for Post-Boil Order
C.16 MDPH Post-Boil Order Instructions for Food Establishments
C.17 MDPH Post-Boil Order Instructions for Hospitals
C.18 MDPH Post-Boil Order Instructions and Update for Dental Practices

C.1 MWRA Community Contacts Database

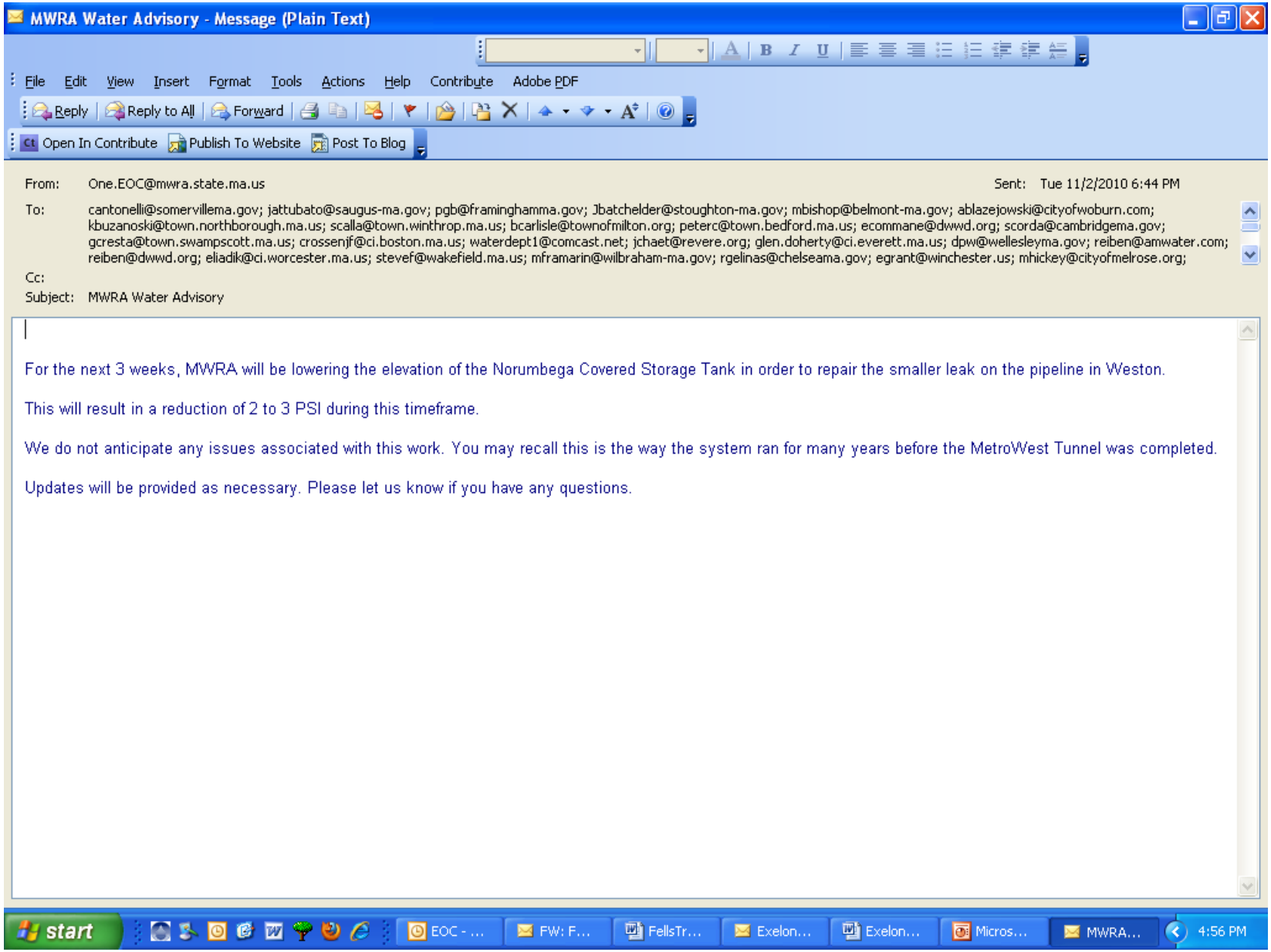
Step one: chose who you want to notify by service type, title, etc.



Step two: click on "Auto eMail"



Step three: write message, choose CCs, and send



C.2 DEP Boil Water Order Fact Sheet

MassDEP Drinking Water Program Fact Sheet
Boil Water Order

Boil water orders or advisories are public announcements advising the public that they should boil their tap water for drinking and other human consumption uses like cooking, hand washing, brushing teeth, etc. Boil water orders are **preventative** measures issued to protect public health from waterborne infectious agents that **could be** or are known to be present in drinking water. Boil water orders are issued by the MassDEP Drinking Water Program (DWP) when MassDEP DWP determines that the consumers of a particular public water system should take precautionary measures with their tap water.

When a boil order or advisory is issued the local public water supplier (PWS) must take appropriate corrective action, continue to monitor its water supply, and notify customers when it has remedied the problem and the boil water order is lifted. The PWS should be contacted for details. See public water suppliers contacts list at http://www.mass.gov/dep/about/organization/watcon.htm#dw . Some cities or towns may also provide information on their website. For general information on boil water orders consumers may also review the Boil Order information on this site or USEPA website and fact sheets on contaminants.

GENERAL PRECAUTIONS

DISCARD any ice, juice, formula, stored water and uncooked foods that were prepared with tap water during the period of concern.

USE BOILED OR BOTTLED WATER for drinking, food preparation, mixing baby formula, making ice, washing food, manual utensil and equipment washing, rinsing and sanitizing, brushing teeth or any other activity involving the consumption of water.

CHILD CARE CENTERS AND SCHOOLS should use only bottled or boiled water for mixing infant formula, hand washing, and for mixing sanitizing solutions for diapering areas and surfaces such as tabletops and toys. Adult employees should use a hand sanitizer after washing hands with tap water and soap. Do not use drinking fountains and discontinue the use of water play tables. Follow all guidance provided by the Massachusetts Department of Education (DOE) and/or the Massachusetts Department of Early Education and Care (DEEC).

RETAIL FOOD ESTABLISHMENTS must follow the guidance of the local board of health and the Massachusetts Department of Public health (MassDPH). Wholesale food manufacturers must follow the guidance of MassDPH. Meat Processing Plants must follow the guidance of MassDPH and the United States Department of Agriculture (USDA).

SWIMMING POOLS, HOT TUBS, AND SPAS that are operated properly, including routine monitoring for adequate disinfection levels, may continue to operate.

SHARE THIS INFORMATION with all other people who drink this water, especially those who may not have received this notice directly (for example, visitors). You can do this by posting this notice in a public place or distributing copies by hand or mail.

TRANSLATE THIS NOTICE for anyone who does not understand English.

DRINKING THE WATER

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108-4746

Produced by the
Bureau of Resource Protection
Drinking Water Program,
October 2009.
Printed on recycled paper.

This information is available in alternate format by calling our ADA Coordinator at 617-556-1171.

Massachusetts Department of Environmental Protection

MassDEP Drinking Water Program Fact Sheet
Boil Water Order

There are two simple and effective methods you can use to treat drinking water for microbiological contaminants (bacteria):

A	**Boiling:** Bring the water to a rolling boil for at least 1 minute. Laboratory data show this is adequate to make the water safe for drinking.

OR

B	**Disinfecting:** Disinfectant tablets obtained from a wilderness store or pharmacy may be used. In an emergency, liquid chlorine bleach such as Clorox© or Purex© can be used at a dose of 8 drops (or 1 teaspoon) of bleach to each gallon of water. (*Careful measurement with a clean dropper or other accurate measuring device is required when using liquid chlorine bleach.)* Let stand for at least 30 minutes before use. Read the label to see that the bleach has 5-6% available chlorine.

WASHING DISHES

It is best to use disposable tableware during the time the water needs disinfection. If that is not possible, the following steps should be taken:

1	Wash dishes normally but be sure to rinse them in a solution of 1 teaspoon of bleach, as mentioned above, in a gallon of warm water (submersion in a dishpan for a minimum of 5 minutes is advised). The dishes should be allowed to air dry. Gloves should be worn when handling bleach to minimize any skin irritation.

2	Because of the many variables involved with dishes washed in a dishwasher, it is recommended that you use the additional rinse step, as described above, after washing.

BATHING AND SHOWERING

Young children should be given sponge baths rather than put in a bathtub where they might ingest the tap water. Adults or children should take care not to swallow water when showering.

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108-4746

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Massachusetts Department of Environmental Protection

MassDEP Drinking Water Program Fact Sheet
Boil Water Order

BRUSHING YOUR TEETH

Use only disinfected *or* boiled water for brushing your teeth.

ICE

Ice cubes are not safe unless made with disinfected *or* boiled water. The freezing process does not kill the bacteria or other microorganisms.

WASHING FRUIT AND VEGETABLES

Use only disinfected *or* boiled water to wash fruits or vegetables that are to be eaten raw.

HAND WASHING

Use only boiled *or* disinfected water for hand washing.

COOKING

Bring water to a rolling boil for 1 minute before adding food.

INFANTS

For infants use only prepared canned baby formula that is not condensed and does not require added water. ***Do not*** use powdered formulas prepared with contaminated water.

HOUSEPLANTS AND GARDENS

Water can be used without treatment for watering household plants and garden plants. The exception would be things like strawberries or tomatoes where the water would contact the edible fruit.

HOUSE PETS

The same precautions taken to protect humans should be applied to pets. Aquatic organisms (e.g. fish) should not be exposed to water containing elevated levels of bacteria. If the organism's water needs to be refreshed use appropriately boiled or bottled water.

FLUSH ALL TAPS WHEN THE BOIL WATER ORDER IS LIFTED

When flushing it is important to carefully follow the instructions provided. **Flushing your household and building water lines including: interior and exterior faucets, showers, water/ice dispensers, water treatment units, etc. See details at** http://www.mass.gov/dep/water/drinking/ flushing.htm Water heaters may need to be disinfected and flushed to remove

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108-4746

Produced by the
Bureau of Resource Protection
Drinking Water Program,
October 2009.
Printed on recycled paper.

This information is available in alternate format by calling our ADA Coordinator at 617-556-1171.

any contaminated water. Some types of water treatment devices may need to be disinfected or replaced before being used. Check with the manufacturer for details.

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108-4746

Commonwealth of
Massachusetts
Deval Patrick, Governor
Tim Murray, Lt. Governor

Executive Office of
Environmental Affairs
Ian A. Bowles
Secretary

Department of
Environmental Protection
Laurie Burt
Commissioner

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617-556-1171.

C.3 MDPH Boil Water Order Frequently Asked Questions

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health

Frequently Asked Questions:
MWRA Water Break/Boiled Water Order
Updated 5/3/2010

Why is there a Boil Water Order for Eastern Massachusetts?
Drinking water in the United States is held to a high standard of safety regarding contamination that might cause infection. When something happens that may decrease the safety of drinking water, precautions are taken to assure public safety. These precautions include "boil water orders." Because of a major water main break in Weston, state officials have issued "boil water orders" in numerous communities in Eastern Massachusetts.

Currently, water is being supplied by the Massachusetts Water Resources Authority (MWRA) to Eastern Massachusetts from sources that have not been fully treated and tested. It is unclear how long this "boil water order" will be in place. For a list of the communities involved and more information, go to www.mwra.com and www.mass.gov.

Is my tap water contaminated?
A "boil water order" is usually put in place as a precaution and does not mean that the tap water is definitely contaminated with bacteria or parasites that could make people ill. The MWRA is treating the water currently being supplied with higher than usual levels of chlorine to decrease the risk of infection. However, because the water *might* be contaminated, it must be boiled to be sure it is safe.

What can you do to protect yourself?
During a "boil water order", tap water is not safe for drinking and must be boiled. Unboiled tap water can be used for bathing, flushing toilets and fire protection. **Water must be brought to a rolling boil for at least 1 minute to be safe**. Use boiled water or bottled water for:

- Drinking
- Cooking
- Washing fruits and vegetables that will be eaten raw
- Mixing infant formula or other liquids reconstituted from powder or concentrate
- Making ice
- Brushing teeth
- Washing cuts or wounds
- Washing your hands

You should boil water throughout the day so you and your family have enough for all of the uses listed above. Fully cooked food containing water should be safe, but discard any ice that might have been made with contaminated water.

Can I use tap water for bathing?
Yes. It is safe to use tap water for bathing. Young children should be supervised so that they do not drink water in the shower or bathtub.

Can I use tap water for washing my hands?
You should wash your hands with soap and boiled water or soap and bottled water. If only tap water is available, it is best to use an alcohol-based hand sanitizer after washing your hands. If neither is possible and your hands have been exposed to germs, such as after using the bathroom, washing with warm tap water and soap and thoroughly drying your hands is much better than not washing them at all. In these instances, try to keep your hands away from your mouth and use a hand sanitizer as soon as possible afterward. It is preferable to dry your hands with a paper towel rather that a cloth towel, if possible.

When preparing or eating foods, it is particularly important to wash your hands with soap and boiled water, or soap and bottled water. If only tap water is available, use hand sanitizer after washing with tap water. Washing with tap water only should be avoided. The following people should pay special attention to proper hand washing during a "boil water order":

- Food preparers and handlers
- Health care workers
- People who care for infants, young children or the elderly
- People who care for those with conditions that lower their immunity to infections

Can I use tap water for brushing my teeth?
No. You should use boiled water or bottled water for brushing your teeth.

I prepared certain foods (e.g., soup, casseroles, salads, prepared juice mixes, etc.) using tap water after the "boil water" order went into effect—are these products safe to eat?
No. Any food that was washed or prepared using tap water from affected communities in the MWRA distribution system from 12:00 p.m. on May 1, 2010 should be discarded due to the risk of contamination.

Can I use tap water for making coffee in an automatic coffee maker?
No. Coffee made in automatic drip coffee makers should not use tap water – the temperature of the water is not high enough to remove contaminants. Instead, use water that has been boiled for one minute or bottled water.

Is it safe to use tap water for making ice?
No. You should use water that has been boiled for one minute or bottled water to make ice. You may purchase ice commercially from a provider outside of the communities affected by the boil water order. If you used tap water to make ice after 12:00 pm on May 1, 2010 it should be discarded.

I purchased vegetables and fruit from a grocery store after the "boil water" order went into effect that used a mister to keep the food fresh—are these fruits and vegetables still safe?
You should contact the store where you purchased the products and ask if a mister was in use after 12:00 p.m. on May 1, 2010. If a mister was used after that time, the food should be discarded as the water in the mister may have been contaminated. Grocery stores have been advised to turn misters off until the water supply is safe for consumption.

Can I wash fruits and vegetables using tap water?
No, washing produce with water from communities affected by the boil water advisory may contaminate the product. You should use water that has been boiled for one minute or bottled water to wash produce.

How can I safely wash dishware and utensils?
You may use a dishwasher if it has a sanitizing cycle. It if does not have a sanitizing cycle, or you are not sure if it does, you may wash dishes and utensils by following these steps:

1. Wash the dishes as you normally would in the dishwasher.
2. As a final step, immerse the dishes for at least one minute in lukewarm water to which **1 teaspoon of bleach per gallon of water** has been added.
3. Allow the dishes to completely air dry.

How can I safely prepare powdered/concentrate infant formula?
You should prepare infant formulas using boiled tap water. If boiled water is not available, you can use bottled water.

What if I drank tap water after the "boil water order" was put in place?
You do not need to seek medical care unless you are showing symptoms such as stomach cramps, nausea, or diarrhea. If you have a health condition that puts you at increased risk for infection, you should consult your doctor.

If I drink water that has not been boiled, can I get sick?
While many infectious organisms can get into drinking water, the parasites *Cryptosporidium* and *Giardia* are of the most concern. The very young, the elderly, and people with conditions that lower their immunity to infection are at higher risk of infections and complications from these parasites. However, taking the recommended precautions will effectively prevent these infections.

How will I know if I get sick from the water?
It usually takes about 7 days for symptoms of *Giardia* or *Cryptosporidium* infection to appear. These symptoms include stomach cramps, nausea, and diarrhea. However, symptoms may develop a shorter or longer time after exposure. Infections due to other bacteria or parasites are less likely, but the symptoms would also be nausea, vomiting, cramps and diarrhea in 2 to 7 days after exposure. If you develop symptoms that might be due to exposure to contaminated water, you should contact your health care provider.

What should I do when the boil water advisory or order has been lifted?
The Massachusetts Department of Environmental Protection and the public water supplier will provide specific instructions. Consumers should flush water pipes within the home. When flushing it is important to carefully follow the instructions that will be provided. Water heaters may need to be disinfected and flushed to remove any contaminated water. Some types of water treatment devices may need to be disinfected and flushed to remove any contaminated water. Some types of water treatment devices may need to be disinfected or replaced before being used. Check with the manufacturer for details.

For more information about what to do during a "boil water order" go to:

- Call Mass 211 Information
- http://www.mass.gov/dep/water/drinking/fsboilordr.pdf
- http://www.cdc.gov/crypto/health_professionals/bwa/index.html

C.4 MDPH Clinical Advisory to Massachusetts Health Care Providers

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
William A. Hinton State Laboratory Institute
305 South Street, Jamaica Plain, MA 02130

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

JUDYANN BIGBY, MD
SECRETARY

JOHN AUERBACH
COMMISSIONER

Clinical Advisory

TO: Massachusetts Heath Care Providers

FROM: Alfred DeMaria, Jr., MD
State Epidemiologist
Massachusetts Department of Public Health

Anita Barry, MD, MPH
Director
Infectious Disease Bureau
Boston Public Health Commission (BPHC)

Larry Madoff, MD
Deputy State Epidemiologist
Massachusetts Department of Public Health

DATE: May 2010

RE: **Waterborne Illness following Exposure to Drinking Water**

This advisory addresses the management of patients who might present with symptoms or findings possibly related to consumption of contaminated water resulting from the disruption of the MWRA water supply.

The recent boil water order was pre-emptive and precautionary, and not a response to water testing suggestive of fecal contamination. Therefore, the risk for infection related to recent events affecting the MWRA water supply is very low. Nonetheless, clinicians should be alert for patients presenting with gastrointestinal illness and should query such patients about drinking water in the affected communities. The infections that would be of particular concern under these circumstances are the parasitic infections, giardiasis and cryptosporidiosis.

Patients who present with a history of exposure (i.e., drinking untreated water), but without symptoms, may be offered reassurance of the extremely low likelihood of acquiring waterborne illness. They can be instructed to contact their clinician if symptoms develop.

Patients who present with gastrointestinal illness (nausea, vomiting, diarrhea, weight loss, abdominal cramps, dehydration, with or without fever) should be managed as in normal circumstances except for a heightened awareness of the possibility of waterborne pathogens:

- Careful attention should be paid to state of hydration and ability to maintain adequate fluid and electrolyte intake, especially in infants, the elderly, pregnant women, and those with underlying chronic medical conditions
- Oral and intravenous rehydration should be given as needed
- Stool specimens (per institutional protocol) may be sent for bacterial culture and for detection of parasites. The laboratory should be alerted to the possibility of *Cryptosporidium* and *Giardia*
- Careful attention should be given to immunocompromised individuals
- Individuals with suspected infectious gastrointestinal illness should be counseled to avoid spreading the infection to others. Advice should include careful attention to personal hygiene and handwashing, avoidance of swimming, and avoiding sexual practices that might result in oral exposure to stool
- Empiric antimicrobial treatment is not normally warranted and may be hazardous

Cryptosporidiosis

- Caused by the coccidian parasite *Cryptosporidium parvum*
- Incubation period 2 to 10 days (average 7 days)
- In normal hosts, symptoms persist for 1-2 weeks (sometimes with spontaneous remissions and exacerbations)
- Nitazoxamide has been FDA-approved for the treatment of cryptosporidiosis in people without underlying immunocompromise, however most people recover spontaneously
- Immunocompromised patients, especially those with advanced HIV disease (low CD4), are more susceptible to cryptosporidiosis and may present with prolonged and unremitting watery diarrhea

Giardiasis

- Caused by the parasite *Giardia lamblia* or *Giardia duodenalis*
- Incubation period 1-2 weeks (average 7 days)
- Symptoms may persist for several weeks and may include (in addition to symptoms mentioned above) greasy stools that tend to float, and gas or flatulence
- Treatment includes nitazoximide and metronidazole

Additional Information

Fact sheets about cryptosporidiosis and giardiasis, including fact sheets in languages other than English, are available at www.bphc.org and mass.gov/dph.

MDPH fact sheets:	cryptosporidiosis	giardiasis
BPHC fact sheets:	cryptosporidiosis	giardiasis

C.5 MDPH Emergency Guidelines for Food Establishments

Emergency Guideline for
Food Establishments During Boil Water Order

What food establishments are affected?
As of 5/1/10, all food establishments including restaurants, supermarkets, caterers, food service operations in schools, nursing homes and hospitals, charitable food facilities, kitchens in non-profit institutions, food manufacturers and distributors and anyone else involved in the commercial preparation and distribution of food, water and beverages are affected in the following communities.

Arlington ∗ Belmont ∗ Boston ∗ Brookline ∗ Canton ∗ Chelsea ∗ Everett ∗ Lexington ∗ Lynnfield Water District ∗ Malden ∗ Marblehead ∗ Melrose ∗ Milton ∗ Nahant ∗ Newton ∗ Norwood ∗ Quincy ∗ Reading ∗ Revere ∗ Saugus ∗ Somerville ∗ Stoneham ∗ Stoughton ∗ Swampscott ∗ Wakefield ∗ Waltham ∗ Watertown ∗ Winchester ∗ Winthrop

What does a boil water order mean?
According to the state Department of Environmental Protection's guidelines for a "boil-water" order all water used for drinking, preparing food, beverages, ice cubes, washing fruits and vegetables, should be brought to a rolling boil for at least one minute on a stovetop, in an electric kettle, or in a microwave (in a microwave-safe container).
DEP Guidelines for Boil Water Order:
http://www.mass.gov/dep/water/drinking/boilfaq.htm

What should restaurant, supermarket and food service managers do?
A food establishment manager (or the "Person-in-Charge") is responsible for conducting both the initial and ongoing assessments to ensure consistent compliance with food safety requirements.

1) Assess food, water and ice in your facility affected as of noon on 5/1/10
2) Implement the appropriate emergency procedures outlined below or remain closed until granted approval to re-open by the board of health
3) Immediately discontinue operations if a safe operation cannot be maintained using alternative procedures
4) Follow all water department requirements for flushing lines and thoroughly clean and sanitize all food contact surfaces prior to resuming normal operations if closed.

What should food establishments do to address the current MWRA boil water order?
The following are temporary alternative procedures that can be taken to address specific affected food operations during a biological contamination of the water supply (boil

water advisory). Where “boiled” water is indicated, the water must remain at a rolling boil for at least one minute. Large volumes of water should be brought to a rolling boil for at least five minutes. Although chemicals (e.g. bleach) are sometimes used for disinfecting small amounts of household drinking water, chemical disinfection is generally not an option for food establishments because of the lack of onsite equipment for testing chemical residuals.

What are Alternative Sources of Drinking Water?

- Use commercially bottled water
  And/Or
- Haul water from an approved public water supply in a covered sanitized container
  And/Or
- Arrange to use a licensed drinking water tanker truck.

What should be done about Beverages Made with Piped in Water – including post mix carbonated beverages, auto-fill coffee makers, instant hot water dispenser, juice, tea, etc.*?*

Discontinue use of post-mix carbonated beverage machine, auto-fill coffee makers, instant hot water heaters, etc. using auto-fill.

What should be done about ice?

- Discard existing ice made after 12:00PM noon and clean and sanitize ice bins
  And
- Discontinue routine methods of making ice until boil water order is lifted
- Use commercially manufactured ice from an unaffected water supply.

What about food products requiring water?

- Discard any ready-to-eat food prepared with water prior to noon on 5/1/10
- Prepare ready-to-eat food using commercially bottled or boiled water.

What alternatives are there for washing/soaking produce?

- Do not use tap water for washing/soaking produce.
- Use pre-washed packaged produce
- Use frozen/canned fruits and vegetables
  And/Or
- Wash fresh produce with boiled, commercially bottled water, or safe potable water hauled from another unaffected public water supply system.

Can tap water be used to thaw frozen foods?

- Do not use tap water to thaw frozen foods

- Thaw only in the refrigerator, or microwave as part of the cooking process.

Can tap water be used when cooking food?

- Use commercially bottled water
  And/Or
- Use water that has been at a rolling boil for at least five minutes
  And/Or
- Haul water from an approved public water supply in a covered sanitized container
  And/Or
- Arrange to use a licensed drinking water tanker truck.

Can tap water be used by employees of a food establishment for handwashing?

- The best practice is to use only safe, boiled, bottled or treated water for handwashing.
- If that is not possible, and handwashing is done with soap and tap water, you must thoroughly dry your hands with paper towels and then use a hand sanitizer.
- As a reminder -- food handlers must NOT touch ready to eat foods with bare hands. Instead they should use physical barriers, such as disposable papers, gloves and utensils.

Can patrons use tap water in the restrooms during a boil water order?

- Patrons use tap water for handwashing provide that hand sanitizer is made available at each sink.
- Post a notice advising patrons not to use tap water for drinking or for brushing teeth.

What about cleaning and sanitizing utensils and tableware?

- Use disposable, single-service utensils and tableware.
  Or
- Use the existing automatic dish machine or the 3-compartment sink. Make certain that the sanitization step is being properly conducted (sanitizer concentration/ temperature).

Can Spray Misting Units be used?

Spray misting units used to spray produce, seafood, meat cases, etc cannot be used.

- Discard any foods exposed to misters after noon on 5/1/10
- Discontinue use of misters until boil water is lifted.

Recovery Phase

What should be done when food establishments have been informed that the water supply is safe again?

Recovery involves the necessary steps for re-opening and returning to a normal safe operation. The Mass DEP and your local water department will provide specific instructions. **A food establishment that was ordered or otherwise required to cease operations may not re-open until authorization has been granted by the local health department.**

After either the municipality or regulatory authority has provided notice that the water supply is safe to use, the person-in-charge must ensure the following has been completed: Flush pipes/faucets: follow the directions of your water utility (in the newspaper, radio, or television) or, as general guidance, run cold water faucets for at least 5 minutes.

- Equipment with waterline connections such as post-mix beverage machines, spray misters, coffee or tea urns, ice machines, glass washers, dishwashers, and other equipment with water connections must be flushed, cleaned, and sanitized in accordance with manufacturer's instructions.
- Run water softeners through a regeneration cycle.
- Drain reservoirs in tall buildings.
- Flush drinking fountains: run continuously for 5 minutes.
- Ice Machine Sanitation:
    - Flush the water line to the machine inlet
    - Close the valve on the water line behind the machine and disconnect the water line from the machine inlet.
    - Open the valve, run 5 gallons of water through the valve and dispose of the water.
    - Close the valve.
    - Reconnect the water line to the machine inlet.
    - Open the valve.
    - Flush the water lines in the machine.
    - Turn on the machine.
    - Make ice for 1 hour and dispose of the first batch of ice.
    - Clean and sanitize all parts and surfaces that come in contact with water and ice, following the manufacturer's instructions.
- Water heaters may need to be disinfected and flushed to remove any contaminated water. Some types of water treatment devices may need to be disinfected and flushed to remove any contaminated water. Some types of water treatment devices may need to be disinfected or replaced before being used. Check with the manufacturer for details.

C.6 Boston Water and Sewer Commission Special Advisory

SPECIAL ADVISORY

Boston Water and Sewer Commission
980 Harrison Avenue, Boston, MA 02119
Phone: 617-989-7000

FOR IMMEDIATE RELEASE
May 1, 2010

ATTENTION ALL BOSTON WATER AND SEWER CUSTOMERS

As the result of a major water main break in Weston, MA, the Massachusetts Water Resources Authority (MWRA) has issued a boil water order and water ban on all non-essential water use until further notice.

- **Water must be boiled for at least one minute before it is safe to drink.**
- Do not use any tap water for cooking, baby formula, tooth-brushing or food preparation that has not been boiled first, or is not bottled.
- Showering and bathing is safe, but you are advised to close your mouth and not consume any water.
- If you have recent medical issues or significant injuries/abrasions you should avoid showering.

State emergency procedures are in place. Regular updates will be posted on www.mwra.com and www.mass.gov throughout this incident.

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C.7 City of Boston Tips for Restaurants during a Boil Water Order

CITY OF BOSTON
Thomas M. Menino, Mayor

TIPS FOR RESTAURANTS

Cooking and Serving Water

Serve only bottled water for drinking or water that has been boiled for at least a full minute. NOTE: State guidelines suggest restaurants should boil water for 5 minutes. The Boston Public Health Commission does not believe this is necessary as long as water has been at a rolling boil for a full minute.

Food Preparation

For food preparation, you should only use water that has been boiled for at least one minute or bottled. NOTE: State guidelines suggest restaurants should discard any food prepared after 12:00 noon. This is done just as a precaution. Tap water in Boston was safe to drink and use for food preparation until 4 PM yesterday.

Ice

Do not use any ice made with tap water or ice machines connected to water pipes after the afternoon of May 1. Drain and sanitize all ice machines. All ice machines should be disconnected until the boil water order has been lifted. Ice is safe only if made from bottled or boiled water.

Automated beverage dispenser

Do not use any automated beverage dispenser

Hand Washing

Wash with soap and hot water and follow-up with an alcohol-based hand sanitizer. Restaurant bathrooms are ok but should be stocked with soap, towels or hand driers, and hand sanitizer. All employees preparing and handling food should wash hands with boiled or bottled water.

Dish Washing

You may wash dishes with a dish washer if it is set to a high temperature or using a chemical disinfectant. If hand washing, use a final rinse that soaks dishes for 1 minute in a solution that uses 1 tablespoon bleach for every gallon of water and allow dishes to fully dry before using.

Coffee Makers/Hot Water Dispensers

Should not be used if they do not boil the water first for more than a minute. Most are set to 190 degrees which is not sufficient. Please do not serve beverages that are made with tap water unless using either bottled or boiled water; this applies to soda, coffee and tea that are dispensed from machines connected to tap water pipes.

C.8 Boston Public Schools Press Release

Water Emergency Update

For Immediate Release
May 02, 2010
Released By:
Mayor's Office

For More Information Contact:
Mayor's Press Office
Press.Office@cityofboston.gov

Mayor Menino announced today that Boston Public Schools will be open tomorrow as usual. The vast majority (80%) of our schools already use bottled water for drinking, and bottled water will be available at the remaining schools, as well. All of our schools will be receiving pre-packaged meals that can be heated and served without the use of water so breakfast and lunch will be served as normal. The BPS will be ensuring that all food service providers have adequate amounts of bottled water for sanitary purposes and will continue to work with our partners at the state level to bring water to our schools if we are in need of more supply. The Superintendent, Carol Johnson, will contact all Boston Public School Parents with following message this evening:

CONNECT-ED CALL:

"Hello, I'm calling from the Boston Public Schools Superintendent's Office to inform you that all Boston Public Schools will be open tomorrow and we look forward to seeing your child in class. We will have pre-packaged meals ready to serve and extra bottled water on hand. If you have any questions, please call the Mayor's 24-hour hotline at 617-635-4500. That hotline is open 24 hours a day, 365 days a year. Thank you, we look forward to a productive day at all of our schools tomorrow. Have a good night."

The City's emergency response operations continue, and the Community Emergency Response Teams (CERT) are mobilized to assist in the provision of emergency water to organizations with vulnerable populations. Provisions will be supplied to targeted institutions that do not have enough boiling capacity such as hospitals, schools, and shelters.

Mayor Menino reminds Boston restaurants and residents that the first solution is boiling the water. Tap water is safe to drink after it has been boiled for over a minute. Restaurants can remain open and must boil water rapidly for one minute before using it for cooking or drinking.

Boston residents and businesses are reminded about the following:

Restaurants:

- Do not use any ice made after the boil alert was issued yesterday evening until further notice. Drain and sanitize all ice machines.
- You may wash dishes with a dish washer if it is set to a high temperature or using a chemical disinfectant.
- You should serve only bottled water for drinking or water that has been boiled for at least a full minute.

- For food preparation, you should only use water that has been boiled for at least one minute or bottled.
- Do not use any automated beverage dispenser which has water as one of the options.

Households:

- The MWRA has issued a boil water order for all households in the city of Boston.
- Water must be boiling for at least one minute before it is safe to drink.
- Do not use any tap water for cooking, baby formula, tooth-brushing, or food preparation that has not been boiled first, or is not bottled.
- Please check on elderly or vulnerable neighbors.
- Please avoid any unnecessary use of water (car washing, yard watering)
- Showering and bathing is safe, but you are advised to close your mouth and not consume any water.

Boston residents with concerns should call the Mayor's 24-Hour Hotline at (617) 635-4500 which will have extra staff on hand to help assist with questions. The Mayor's hotline has already fielded 5,000 calls since the Boil Water Order was issued. Additional information is also available on cityofboston.gov.

At this time, the MWRA is estimating the boil water order will be in effect "for days, but not weeks." Working with state agencies, the City will continue to monitor the situation and alert the public with further information. **School will be Open tomorrow and Emergency Water will be Provided to Institutions Serving Vulnerable Populations. Mayor Reminds Residents to Boil Water before Drinking.** Today, the Massachusetts Water Resource Authority updated Mayor Menino and the City of Boston on the current situation regarding the water main break in Weston. At this time the water emergency is still in effect, and all residents should continue to boil all drinking water and also continue to conserve non-essential water use.

C.9 City of Boston, Mayor's 24-hour Constituent Engagement Call Center Script

WATER MAIN BREAK/BOIL WATER ORDER

TALKING POINTS FOR 4500 STAFF & VOLUNTEERS

GENERAL FAQs: Last Updated 5/2/2010, 11:35 AM

What happened? Because of a major water main break in Weston, state officials have issued "boil water orders" in numerous communities in Eastern Massachusetts. Currently, water is being supplied by the Massachusetts Water Resources Authority (MWRA) to Eastern Massachusetts from alternative reservoirs that have not been fully treated and tested. A "boil water order" is usually put in place as a precaution and does not mean that the tap water is definitely contaminated with bacteria or parasites that could make people ill. The MWRA is treating the water currently being supplied with higher than usual levels of chlorine to decrease the risk of infection. However, because the water has not been fully treated, it must be boiled to be sure it is safe. **We would advise you stay tuned to the news for more information or visit www.mass.gov.**

When was the switch made to alternative reservoirs? 6:40 p.m. on Saturday, May 1st

When will be ban be lifted? MWRA officials are saying now that the boil water order will stay in effect for days not weeks. No further info at this time. Stay tuned to local news reports or call the hotline at any time.

Is water going to be distributed? The first solution is boiling the water. The state has notified distributors to send emergency supplies to the areas effected and we will be working with the state to distribute water after we hear from them the extent and duration of this incident. The first priority will be to ensure that large health care institutions, schools, and chronic disease facilities have adequate supplies of water to ensure the safety of vulnerable residents. Tap water is safe to drink after it's been boiled for over a minute.

Are the schools open tomorrow? At this point, we are planning for schools to be open tomorrow. Should this change, an announcement will be made through ConnectEd and the media. Schools will follow the same safety protocols we are advising to residents. All meals served in schools will be prepared and pre-packaged at a facility outside the city to avoid possible contact with untreated tap water.

What if I already drank the water? In most cases, small amounts of water should not cause any serious problems or illness. If you have symptoms like diarrhea, stomach ache, call your doctor. Please do not go to an emergency room unless you are seriously ill and/or have been advised by your health care provider to seek immediate care. Please do not go to an emergency room to be checked out because you drank tap water and are concerned. There is no testing that can be done at emergency rooms for patients who are not in need of emergency care.

Is the water safe it I use a filter? Tap water should be boiled even if you have a home filtering system.

Is it safe to eat in a restaurant? Restaurants in the city are open and have been advised to follow safety protocols.

SPECIFIC ISSUES:

Water tips for residents	See tip sheet
Water tips for restaurants	See tip sheet
Hospitals/Health Care Orgs	Contact the Boston Public Health Commission
Reports of Price Gouging	Take down the location and give information to Janine or Justin. We are taking reports for the Boston Police Department
Elderly/Vulnerable Residents:	Advise to follow precautions and offer to take down information if more support become available
CERT members (Mayor's emergency response team):	Contact the EOC (Emergency Ops Center) at 617-343-2400
Callers from other cities:	See list from MWRA below; they can call 211 or visit mass.gov for more information

TIPS FOR RESIDENTS

Drinking, Cooking, Food Preparation, Tooth-Brushing & Baby Formula

Water must be boiled for at least one minute before it is safe to drink or, use bottled water. Hot drinks that are made with boiling water are safe to consume.

Showering & Bathing

This is safe, but you are advised to cloth your mouth and not consume any water, however;

- Toddlers & Infants should be sponge-bathed
- If you have recent medical issues or significant injuries or abrasions you should not.

Washing Hands

Wash hands in hot water and follow with an alcohol based hand sanitizer, if available.

Washing Dishes

Residential dishwashers are safe to use on hot or the sanitizing cycle.

If you hand wash, as a final step, immerse dishes for at least one minute in lukewarm water & bleach (1 tablespoon per gallon of water) and allow dishes to air dry completely.

Washing Cars, Watering Lawns

Please avoid, so that we can conserve water at this point.

Laundry

Laundry machines can be operated as normal.

Ice-Making

Residents are advised to consider disconnecting home ice-makers.

Pets

MSPCA recommends you take the same precaution for pets. The MWRA has issued a boil water order for all households in the city of Boston.

Eating at Restaurants

Eating at restaurants: Restaurants have been notified about the boil water order. You should feel free to confirm with your server that the water has been boiled or is bottled and that they have taken necessary steps in the kitchen to prepare food safely.

Hair Coloring:

Probably ok, but changing chlorine levels might impact the hair coloring product. Best advice is to hold off.

TIPS FOR RESTAURANTS:

Cooking and Serving Water

Serve only bottled water for drinking or water that has been boiled for at least a full minute

Food Preparation

For food preparation, you should only use water that has been boiled for at least one minute or bottled.

Ice

Do not use any ice made after the afternoon of May 1. Drain and sanitize all ice machines. All ice machines should be disconnected until the boil water order has been lifted. Ice is safe only if made from bottled or boiled water.

Automated beverage dispenser

Do not use any automated beverage dispenser

Hand Washing

Wash with soap and hot water and follow-up whenever possible with an alcohol-based hand sanitizer. Restaurant bathrooms are ok. For food prep, you should boil water and put it in a container with a spikit and use it to wash hands.

Dish Washing:

You may wash dishes with a dish washer if it is set to a high temperature or using a chemical disinfectant

CITY RESPONSE IN SHORT:

- Yesterday, city had BPD and BTD crews on streets with loudspeakers advising people to boil water; BHA flyer-ed buildings; ISD, police and BTD crews worked to notify restaurants and businesses
- An emergency alert message went out yesterday to all city residents via Everbridge, the Boston Public Schools and Elderly Commission
- City is posing information on video message boards throughout the city
- ISD officials are reaching out to restaurants impacted with the same information we have on precautions.

OTHER CITIES (SOURCE: MWRA)

Any callers from other parts of the state: Contact 211 or visit mass.gov.

Arlington	Lynnfield Water	Newton	Stoughton
Belmont	District	Norwood	Swampscott
Boston	Malden	Quincy	Wakefield
Brookline	Marblehead	Reading	Waltham
Canton	Medford	Revere	Watertown
Chelsea	Melrose	Saugus	Wilmington
Everett	Milton	Somerville	Winchester
Lexington	Nahant	Stoneham	Winthrop

Additional Questions: Last Updated 5/4/10, 11:59 AM

Is it safe to use a water filter after the ban? Water filters used during the boil water order, including those attached to faucets, do not need to be changed.

I just got a call from this number? The mayor sent out an automated message through a reverse 911 system, a schools alert list and a senior list in order to let residents know that the water boil order was lifted. Here's what it said:

> *The boil water order in effect for the City of Boston has ended. With a few simple steps, you can go back to normal water use with full confidence. Residents are advised to flush cold water lines for at least 1 minute and all hot water lines for 15 to 30 minutes. At cityofboston.gov you can find more information for businesses, restaurants and tips on using household appliances. Thank you.*

Where can I find more information online? The City of Boston website at www.cityofboston.gov has updated information for residents and for food establishments right on its home page.

How long should people in apartments let their hot water run first? Public Health Commission advises to follow the same advice and let your hot water run for 30 mins. It's never a good idea to drink from the hot water. Both the cold and hot water will flush out if you follow instructions.

Will I get a discount on my water bill? That's a decision for the Boston Water & Sewer Commission. We have no information at this time. You could contact them later this week.

I have brown water, what should I do? Boston Water & Sewer is reporting some brown water. It's a result of many people flushing out their homes. The water is safe to drink but may be discolored for a brief period.

What if I have a tankless hot water heater? Follow the same instructions. Let the hot water run on all faucets for 15-30 minutes.

I saw other communities handing out bottled water to residents, why not Boston? First, remember that tap water was safe to drink after it was boiled for at least a minute. Boston was allocated a limited amount of water by the state and we did distribute 35,000 gallons of water to close to 100 organizations, including large health care institutions, schools, and chronic disease facilities to ensure they have adequate supplies for vulnerable residents. We also sent water to Boston Housing Authority developments and some senior housing units as need and supply were available. We focused our resources on helping people who could not easily boil water. Some other communities took a first-come, first-served approach.

C.10 City of Boston Emergency Notification Messages

Initial Reverse 911 Call

The MWRA has issued a boil water order for all households in the city of Boston.

Water must be boiling for at least one minute before it is safe to drink.

Do not use any tap water for cooking, baby formula, tooth-brushing, or food preparation that has not been boiled first, or is not bottled.

Post Boil Reverse 911 Call

The boil water order in effect for the City of Boston has ended. With a few simple steps, you can go back to normal water use with full confidence. Residents are advised to flush cold water lines for at least 1 minute and all hot water lines for 15 to 30 minutes. At cityofboston.gov you can find more information for businesses, restaurants and tips on using household appliances. Thank you.

Post Boil Text Message

Boston City Msg: Boil water order ended. Flush cold water taps for 1 min & all hot water taps 15-30. Cityofboston.gov for more.

Post Boil Email

A Message from the City of Boston: The boil water order in effect for the City of Boston has ended. With a few simple steps, you can go back to normal water use with full confidence. Residents are advised to flush cold water lines for at least 1 minute and all hot water lines for 15 to 30 minutes. At www.cityofboston.gov you can find more information for businesses, restaurants and tips on using household appliances. More detailed instructions are below from the Massachusetts Department of Public Health. Thank you.

INSTRUCTIONS FOR POST-BOIL ORDER Residents are advised to “flush” their water following the lifting of the boil order in order to clear plumbing of potentially contaminated water. Flushing your household and building water lines includes interior and exterior faucets; showers; water and ice dispensers; water treatment units, etc. Please follow these guidelines: Cold Water Faucets: Run tap water until the water feels cold, 1 minute or more, before drinking, tooth brushing, or using for food preparation. Hot Water Faucets: To clear hot water pipes and water heater of untreated water, turn on all hot water faucets and flush for a minimum of 15 minutes for a typical household 40-gallon hot water tank and 30 minutes for an 80-gallon hot water tank or larger. Never use water from the “hot” faucet for drinking, cooking, or other internal-consumption purposes. After this flushing, hot water is then safe to use for washing hands, and for hand-washing of dishes, pots and pans, etc. Refrigerators: Water dispensers from refrigerators should be flushed by at least one quart of water. Dishwashers: After

flushing hot water pipes and water heater, run dishwasher empty one time. Humidifiers: Discard any water used in humidifiers, Continuous Positive Airway Pressure (CPAP), oral, medical or health care devices, and rinse the device with clean water. Food and baby formula: Be sure you have discarded any baby formula or other foods prepared with water on the days of the boil order. (If unsure of the dates contact your water Department.) Ice cubes: Automatic ice dispensers should be emptied of ice made during the boil order. Then, discard ice made over an additional 24 hour period to assure complete purging of the water supply line. Due to the flushing of the lines by residents and the flushing of the hydrants, some customers may experience a lack of water pressure and/or discolored water. However, this is an expected result and does not pose a health risk. Contact your local Water Department if you have any questions.

Reverse Call to Public School Students

Hello, I'm calling from the Boston Public Schools Superintendent's Office to inform you that all Boston Public Schools will be open tomorrow and we look forward to seeing your child in class. We will have pre-packaged meals ready to serve and extra bottled water on hand. If you have any questions, please call the Mayor's 24-hour hotline at 617-635-4500. That hotline is open 24 hours a day, 365 days a year. Thank you, we look forward to a productive day at all of our schools tomorrow. Have a good night.

C.11 MWRA Archived Website – Documents Related to Shaft 5A Pipe Break, May 2010

Massachusetts Water Resources Authority

home

CONTACT: Ria Convery, Communications Director
(617) 788-1105, <**ria.convery@mwra.state.ma.us**>

- ARCHIVE -
DOCUMENTS RELATED TO SHAFT 5A PIPE BREAK
May, 2010

This page is an archive of documents and links related to the Shaft 5A Pipe Break and subsequent Boil Water Order (May 1-4, 2010) that were posted on mwra.com . This information is provided to the public for the record.

Presentation to the MWRA Board of Directors (PDF)
Shaft 5A Pipe Break
May 6, 2010
-
MWRA "INCIDENT UPDATE" WEB PAGE
Single web page updated as needed with public information.
First posted May 1, 2010, closed on May 4, 2010.
-
MWRA Video
Pipe Break, as Captured by MWRA Surveillance Camera (.wmv)
Filmed May 1, 2010 - Posted May 4, 2010
-
Link to video
Governor Patrick Lifts Boil Water Order
Courtesy Boston.com
Posted May 4, 2010
-
Link to Mass.gov:
Governor Patrick Lifts Boil Water Order for 30 MWRA Communities
Mass.Gov Press Release
May 4, 2010
-
Link to Mass. DPH:
FAQs and Boil Water Information
Includes all Boil Water Order related FAQs and instructions issued by the Mass. Department of Public Health during and after the Boil Water Order. In English and En Español.
Link first posted on mwra.com May 1, 2010
-
Link to video
Gov. Patrick: **"The extent of the damage is not as great as we feared"**
Courtesy NECN.com
Posted May 2, 2010
-
Link to video
"Governor Declares State of Emergency"
Courtesy Boston.com

Posted May 1, 2010

-

MWRA Notice En Español

MWRA DA ORDEN DE HERVIR EL AGUA POR CAUSA DE AGUJERO EN LA TUBERIA DE AGUA

Posted May 1, 2010

-

MWRA Press Release ("original boil water order notice")

MWRA WATER MAIN BREAK REQUIRES BOIL WATER ORDER

Posted May 1, 2010

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Updated June 16, 2010

C.12 MWRA Water Main Break Requires Boil Water Order

Massachusetts Water Resources Authority
FOR IMMEDIATE RELEASE

home

DATE: May 1, 2010

CONTACT: Ria Convery, Communications Director, <ria.convery@mwra.state.ma.us>

MWRA WATER MAIN BREAK REQUIRES BOIL WATER ORDER

May 4 2010
THIS INCIDENT IS CLOSED.
THIS PRESS RELEASE IS POSTED FOR THE RECORD ONLY.

GO TO LATEST UPDATE
New information added regularly

Chelsea, MA – Water service to all MWRA customer communities east of Weston has been interrupted by a major water pipe break in Weston. Due to this break, **A BOIL WATER ORDER IS BEING ISSUED FOR DRINKING WATER FOR ALL MWRA COMMUNITIES EAST OF WESTON UNTIL FURTHER NOTICE.**

Mass. Department of Public Health
MWRA Water Break - Boil Water Information

- Frequently Asked Questions PDF
- Boil Water Order Guidelines PDF
- Emergency Guidelines for Food Establishments During Boil Water Order PDF
- All Guidelines

In addition, emergency water conservation measures are being implemented for all impacted communities. A complete list of MWRA water communities is included on this page.

MWRA is activating its emergency water supplies such as the Sudbury Aqueduct, Chestnut Hill Reservoir and Spot Pond Reservoir. **THIS WATER WILL NOT BE SUITABLE FOR DRINKING**, but can be used for bathing, flushing and fire protection.

The following communities are affected by the Boil Water Order

Communities that are not listed below are NOT affected by this boil water order.

Arlington
Belmont
Boston
Brookline
Canton
Chelsea
Everett
Hanscom AFB
Lexington
Lynnfield WD
Malden
Marblehead
Medford
Melrose
Milton
Nahant
Newton
Norwood
Quincy
Reading
Revere
Saugus
Somerville

The leak is located at the location where the MetroWest Water Supply Tunnel meets the City Tunnel on Recreation Road. This 120-inch diameter pipe transports water to our communities east of Weston – as far north as Wilmington and south to Stoughton. Water is leaking into the Charles River at rate of over 8 million gallons an hour. MWRA crews are on site; engineers are assessing the situation to determine next steps.

Stoneham
Swampscott
Wakefield
Waltham
Watertown
Winchester
Winthrop

See all MWRA communities

Map of the MWRA Water System
jpg | pdf

Updates will be posted on Mass.gov and MWRA's website at www.mwra.com throughout the event.

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POSTED May 1, 2010. Last archived September 27, 2010

C.13 MWRA Community Updates

UPDATE May 1, 2010 1:30 PM

There is a leak on a major water pipe in Weston that could potentially interrupt water service to all of our customer communities east of Weston.

MWRA ASKS THAT PEOPLE STOP USING WATER FOR THE NEXT FEW HOURS.

Updates will be emailed to community representatives and posted on MWRA's website at www.mwra.com throughout the event.

The Emergency Operations Center is open. The phone number is (617) 305-5970.

Press calls should be directed to Ria Convery.

UPDATE 4:30 PM May 1, 2010

The leak is located at the location where the MetroWest Water Supply Tunnel meets the City Tunnel on Recreation Road. This 120-inch diameter pipe transports water to our communities east of Weston – as far north as Wilmington and south to Stoughton. Water is leaking into the Charles River at rate of over 8 million gallons an hour. MWRA crews are on site; engineers are assessing the situation to determine next steps.

Updates will be posted on Mass.gov and MWRA's website at www.mwra.com throughout the event.

UPDATE 8:47 PM May 1, 2010

MWRA has been able to stop the leak at the pipe in Weston. Water is now being delivered through the emergency back-up reservoir system. Water pressure is stable.

Please remember that a Boil Water is in effect for the following communities until otherwise notifies and water use should be restricted to essential use only.

More information on Boil Water Orders:
http://www.mass.gov/dep/water/drinking/boilordr.htm

UPDATE 2:30 AM May 2, 2010

Subject: May 2 Community Water Advisory (2:30 am Update) rev.

If communities receive any calls regarding how to reach MEMEA, please direct them to call 211.

Arlington
Belmont
Boston
Brookline
Canton
Chelsea
Everett
Lexington
Lynnfield W.D.
Malden
Marblehead
Medford
Melrose
Milton
Nahant
Newton
Norwood
Quincy
Reading
Revere
Saugus
Somerville
Stoneham
Swampscott
Waltham
Wakefield
Watertown
Winchester
Winthrop

More information on Boil Water Orders:

http://www.mass.gov/dep/water/drinking/boilordr.htm

UPDATE 8:00 AM May 2, 2010

If communities receive any calls regarding how to reach MEMA, please direct them to call 211.

Community Update

MWRA has been able to stop the leak at the pipe in Weston. Excavation of the leak is complete, repairs have been initiated. Water pressure continues to be stable. All MWRA system water is currently coming from the Carroll Treatment Plant.

All communities below are being asked to collect a round of coliform samples this morning (Sunday) per their total coliform rule locations. Additional sampling may be requested later today. The MWRA Chelsea Water Quality Lab is open.

Please remember that a Boil Water is in effect for the following communities until otherwise notified and water use should be restricted to essential use only.

COMMUNITIES AFFECTED BY BOIL WATER ORDER
List Updated May 2, 2010 10:00 AM

Arlington	Nahant
Belmont	Newton
Boston	Norwood
Brookline	Quincy
Canton	Reading
Chelsea	Revere
Everett	Saugus
Hanscom AFB	Somerville
Lexington	Stoneham
Lynnfield W.D.	Swampscott
Malden	Waltham
Marblehead	Wakefield
Medford	Watertown
Melrose	Winchester
Milton	Winthrop

More information on Boil Water Orders:

http://www.mass.gov/dep/water/drinking/boilordr.htm

UPDATE 12:00 PM May 2, 2010

If communities receive any calls regarding how to reach MEMA, please direct them to call 211.

Community Update

MWRA has been able to stop the leak at the pipe in Weston. Excavation of the leak is complete, repairs have been initiated. Water pressure continues to be stable. MWRA system water is currently coming from the Carroll Treatment Plant and now being supplemented by the Chestnut Hill Emergency Reservoir.

All communities below are being asked to collect a round of coliform samples this morning (Sunday) per their total coliform rule locations. Another round of sampling is being requested for later today. The MWRA Chelsea Water Quality Lab is open.

Please remember that a Boil Water is in effect for the following communities until otherwise notified and water use should be restricted to essential use only.

COMMUNITIES AFFECTED BY BOIL WATER ORDER
List Updated May 2, 2010 12:00 PM

Arlington
Belmont
Boston
Brookline
Canton
Chelsea
Everett
Hanscom AFB
Lexington
Lynnfield W.D.
Malden
Marblehead
Medford
Melrose
Milton
Nahant
Newton
Norwood
Quincy
Reading
Revere
Saugus
Somerville
Stoneham
Swampscott
Waltham
Wakefield
Watertown
Winchester
Winthrop

More information on Boil Water Orders:

http://www.mass.gov/dep/water/drinking/boilordr.htm

UPDATE 4:30 AM May 3, 2010

If communities receive any calls regarding how to reach MEMA, please direct them to call 211.

Community Update

Welding of the pipe break at Weston has been completed. Pipe is being filled and then will be pressured tested. Water pressure in MWRA service area continues to be stable. MWRA estimates that line may be back in services later this morning.

Please remember that a Boil Water is in effect for the following communities until otherwise notified and water use should be restricted to essential use only.

All communities below were asked to:

Collect a round of coliform samples Sunday morning and another set Sunday evening (per their total coliform rule locations). Most communities have submitted these samples.

Communities will collect a second round of coliform samples today.

Collection of these samples will assist with resolution of the open boil water order and we thank you for your cooperation. The MWRA Chelsea Water Quality Lab is and will remain open.

COMMUNITIES AFFECTED BY BOIL WATER ORDER
List Updated May 3, 2010 4:3 AM

Arlington	Nahant
Belmont	Newton
Boston	Norwood
Brookline	Quincy
Canton	Reading
Chelsea	Revere
Everett	Saugus
Hanscom AFB	Somerville
Lexington	Stoneham
Lynnfield W.D.	Swampscott
Malden	Waltham
Marblehead	Wakefield
Medford	Watertown
Melrose	Winchester
Milton	Winthrop

For more information on Boil Water Orders:

http://www.mass.gov/dep/water/drinking/boilordr.htm

UPDATE 7:00 AM May 3, 2010

If communities receive any calls regarding how to reach MEMA, please direct them to call 211.

Community Update

The 120" pipe connection has been repaired, pressurized and put back into service. Fully treated water has been distributed to the MWRA system since about 6 PM on Sunday and is expected to continue. Water pressure in MWRA service area is in typical ranges.

Please remember that a Boil Water Order is in effect for the following communities until otherwise notified and water use should be restricted to essential use only.

Essentially every community provided two sets of coliform/water quality samples on Sunday (thank you). Communities will collect a second round of coliform samples today. Collection of these samples will assist with resolution of the open boil water order and we again thank you for your cooperation. The MWRA Chelsea Water Quality Lab will remain open.

COMMUNITIES AFFECTED BY BOIL WATER ORDER
List Updated May 3, 2010 7:00 AM

Arlington
Belmont
Boston
Brookline
Canton
Chelsea
Everett
Hanscom AFB
Lexington
Lynnfield W.D.
Malden
Marblehead
Medford
Melrose
Milton
Nahant
Newton
Norwood
Quincy
Reading
Revere
Saugus
Somerville
Stoneham
Swampscott
Waltham
Wakefield
Watertown
Winchester
Winthrop

For more information on Boil Water Orders:

http://www.mass.gov/dep/water/drinking/boilordr.htm

UPDATE 3:00 PM May 3, 2010

Community Advisory
MWRA SERVICE AREA

WATER SYSTEM FLUSHING

Based upon our hydraulic modeling, MWRA has selected very specific areas in the MWRA system and Boston and Brookline for flushing (those areas closest to the Chestnut Hill Reservoir or those areas most likely to receive the water from this source).

If a community desires to flush their system, please take precautions to limit and control the amount and velocity of water moved. The potential for discolored water or the possibility of non-representative coliform results could occur from the non-routine movement of water related to flushing (especially during this boil water order increased sampling period).

BOIL WATER ORDER STATUS

Ongoing water quality sampling continues in MWRA communities and initial sample results are beginning to be analyzed. The time frame for the lifting of the boil water order is still uncertain.

Therefore it would be irresponsible for MWRA to speculate on when the boil water order will be lifted. As soon as MWRA has more precise information, we will inform our member communities.

COMMUNITIES AFFECTED BY BOIL WATER ORDER
List Updated May 3, 2010 3:00 PM

Arlington	Nahant
Belmont	Newton
Boston	Norwood
Brookline	Quincy
Canton	Reading
Chelsea	Revere
Everett	Saugus
Hanscom AFB	Somerville
Lexington	Stoneham
Lynnfield W.D.	Swampscott
Malden	Waltham
Marblehead	Wakefield
Medford	Watertown
Melrose	Winchester
Milton	Winthrop

For more information on Boil Water Orders:

http://www.mass.gov/dep/water/drinking/boilordr.htm

MAY 4, 2010

IMPORTANT NOTICE

GOVERNOR PATRICK LIFTS BOIL WATER ORDER FOR 30 COMMUNITIES
Press Release on Mass.Gov

- Instructions for Post Boil Order for The General Public - Households PDF | HTML | .DOC
- Instructions for Post Boil Order for Food Establishments PDF | HTML | .DOC

Water service to all MWRA customer communities east of Weston has been interrupted by a major water pipe break in Weston. Due to this break, ***A BOIL WATER ORDER IS BEING ISSUED FOR DRINKING WATER FOR ALL MWRA COMMUNITIES EAST OF WESTON UNTIL FURTHER NOTICE.*** In addition, emergency water conservation measures are being implemented for all impacted communities. A complete list of MWRA water communities is included on this page.

Mass. Department of Public Health
MWRA Water Break - Boil Water Information

- Frequently Asked Questions PDF
- Boil Water Order Guidelines PDF
- Emergency Guidelines for Food Establishments During Boil Water Order PDF
- All Guidelines

MWRA is activating its emergency water supplies such as the Sudbury Aqueduct, Chestnut Hill Reservoir and Spot Pond Reservoir. ***THIS WATER WILL NOT BE SUITABLE FOR DRINKING,*** but can be used for bathing, flushing and fire protection.

C.14 Governor Patrick Lifts Boil Water Order for All 30 MWRA Communities, Press Release

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

May 04, 2010 - For immediate release:

Governor Patrick Lifts Boil Water Order for all 30 MWRA Communities

Ban removed following swift repair of water-line rupture & extensive water-quality testing

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PLEASE NOTE: Guidelines for water use going forward are at the bottom of this page and at www.mwra.com.

BOSTON – Tuesday, May 4, 2010 – Governor Deval Patrick today announced that the water flowing to Massachusetts Water Resources Authority (MWRA) communities is once again clean and safe for all purposes, following repair of the rupture of the major water supply line to much of Greater Boston on Saturday, May 1st.

"Thanks to the efforts of MWRA and the whole team of state agencies who have responded to this emergency, the people of Boston and surrounding communities can once again rely on the safety of their tap water for drinking," said Governor Patrick. "With a few simple steps, residents and businesses can now go back to normal water use, with full confidence."

The boil-water order, which was issued at 4 p.m. on Saturday, has been lifted for all 30 MWRA communities east of Weston whose water service was interrupted by a rupture of the MetroWest Water Supply Tunnel on Saturday.

Since Monday morning, more than 800 water samples at 482 locations have been taken in affected communities, with those samples tested by MWRA under protocols agreed-upon with the Department of Environmental Protection (MassDEP). Those tests have shown no contamination that could threaten public health. As a result, the boil water order can be lifted, and normal use of water can be resumed in the 30 affected communities, following certain steps to ensure than any less-than-fully treated water is purged from the water supply system in homes, businesses, and institutions.

"Governor Patrick's priorities have always been public safety and public health, and with the efforts of state agencies and the cooperation of the public, both have been fully protected under difficult circumstances," said Ian Bowles, Secretary of Energy and Environmental Affairs.

"I commend the Massachusetts Emergency Management Agency, Mayor Menino and other local officials, National Guard, MassDOT, the Teamsters, and private vendors for their response to this water crisis and mobilizing to deliver bottled water where it was most needed," said Mary Beth Heffernan, Secretary of Public Safety and Security.

“I could not be more proud of the MWRA team and its partners, for the job they have done responding to this unprecedented challenge and achieving such a quick resolution,” said Fred Laskey, executive director of the MWRA.

Beginning at approximately 6:40 p.m. Saturday, back-up water supply of chlorinated, but not fully treated water from the Chestnut Hill reservoir was used to supplement treated water delivered through the Hultman Aqueduct (which is in the midst of rehabilitation to provide redundant capacity for the MetroWest Tunnel) to maintain water pressure for flushing, fire fighting, and other priority uses. But this water was not deemed safe for drinking or cooking without decontamination by boiling for at least a full minute.

The source of the rupture was swiftly determined to be a failed coupling connecting sections of the MetroWest Tunnel in Weston. With crews working through the night, MWRA and its contractors were able to fabricate a replacement coupling and install it by 4 a.m. on Monday, May, 3rd. After pressure testing and disinfection, the repaired MetroWest Tunnel was up and running by 6 a.m., in time for the morning peak water demand.

Guidelines for water use going forward are as follows:
Residents are advised to “flush” their water following the lifting of the boil order in order to clear plumbing of potentially contaminated water. Flushing your household and building water lines includes interior and exterior faucets; showers; water and ice dispensers; water treatment units, etc.

- *Cold Water Faucets:* Run tap water until the water feels cold, 1 minute or more, before drinking, tooth brushing, or using for food preparation.
- *Hot Water Faucets:* To clear hot water pipes and water heater of untreated water, turn on all hot water faucets and flush for a minimum of 15 minutes for a typical household 40-gallon hot water tank and 30 minutes for an 80-gallon hot water tank or larger. Never use water from the “hot” faucet for drinking, cooking, or other internal-consumption purposes. After this flushing, hot water is then safe to use for washing hands, and for hand-washing of dishes, pots and pans, etc.
- *Refrigerators:* Water dispensers from refrigerators should be flushed by at least one quart of water.
- *Dishwashers:* After flushing hot water pipes and water heater, run dishwasher empty one time.
- *Humidifiers:* Discard any water used in humidifiers, Continuous Positive Airway Pressure (CPAP), oral, medical or health care devices, and rinse the device with clean water.
- *Food and baby formula:* Be sure you have discarded any baby formula or other foods prepared with water on the days of the boil order. (If unsure of the dates contact your water Department.)
- *Ice cubes:* Automatic ice dispensers should be emptied of ice made during the boil order. Then, discard ice made over an additional 24 hour period to assure complete purging of the water supply line.

Due to the flushing of the lines by residents and the flushing of the hydrants, some customers may experience a lack of water pressure and/or discolored water. However, this is an expected result and does not pose a health risk. Contact your local Water Department if you have any questions.

Additional information for food establishments can be found at www.mwra.com.

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C.15 MDPH Instructions for Post-Boil Order

INSTRUCTIONS FOR POST-BOIL ORDER

Residents are advised to "flush" their water following the lifting of the boil order in order to clear plumbing of potentially contaminated water. Flushing your household and building water lines includes interior and exterior faucets; showers; water and ice dispensers; water treatment units, etc.

Please follow these guidelines:--

Cold Water Faucets: Run tap water until the water feels cold, 1 minute or more, before drinking, tooth brushing, or using for food preparation.

Hot Water Faucets: To clear hot water pipes and water heater of untreated water, turn on all hot water faucets and flush for a minimum of 15 minutes for a typical household 40-gallon hot water tank and 30 minutes for an 80-gallon hot water tank or larger. Never use water from the "hot" faucet for drinking, cooking, or other internal-consumption purposes. After this flushing, hot water is then safe to use for washing hands, and for hand-washing of dishes, pots and pans, etc.

Refrigerators: Water dispensers from refrigerators should be flushed by at least one quart of water.

Dishwashers: After flushing hot water pipes and water heater, run dishwasher empty one time.

Humidifiers: Discard any water used in humidifiers, Continuous Positive Airway Pressure (CPAP), oral, medical or health care devices, and rinse the device with clean water.

Food and baby formula: Be sure you have discarded any baby formula or other foods prepared with water on the days of the boil order. (If unsure of the dates contact your water Department.)

Ice cubes: Automatic ice dispensers should be emptied of ice made during the boil order. Then, discard ice made over an additional 24 hour period to assure complete purging of the water supply line.

Due to the flushing of the lines by residents and the flushing of the hydrants, some customers may experience a lack of water pressure and/or discolored water. However, this is an expected result and does not pose a health risk. Contact your local Water Department if you have any questions.

C.16 MDPH Post-Boil Order Instructions for Food Establishments

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
250 Washington Street, Boston, MA 02108

May 4, 2010

POST-BOIL ORDER INSTRUCTIONS FOR FOOD ESTABLISHMENTS

What should be done when food establishments have been informed that the water supply is safe again?

The person-in-charge must ensure the following has been completed:

1. Flush pipes/faucets: run cold water faucets for at least 5 minutes or follow more detailed directions from your water utility.

2. Equipment with waterline connections such as post-mix beverage machines, spraymisters, coffee or tea urns, ice machines, glass washers, dishwashers, and other equipment with water connections must be flushed, cleaned, and sanitized in accordance with manufacturer's instructions.

3. Run water softeners through a regeneration cycle, if relevant.

4. Drain reservoirs in tall buildings.

5. Flush drinking fountains: run continuously for 5 minutes.

6. Ice machine sanitation:
   - Flush the water line to the machine inlet
   - Close the valve on the water line behind the machine and disconnect the water line from the machine inlet.
   - Open the valve, run 5 gallons of water through the valve and dispose of the water.
   - Close the valve.
   - Reconnect the water line to the machine inlet.
   - Open the valve.
   - Flush the water lines in the machine.
   - Turn on the machine.
   - Make ice for 1 hour and dispose of the first batch of ice.
   - Clean and sanitize all parts and surfaces that come in contact with
   - water and ice, following the manufacturer's instructions.

7. Water heaters may need to be disinfected and flushed to remove any contaminated water. Some types of water treatment devices may need to be disinfected and flushed to remove any contaminated water. Some types of water treatment devices may need to be disinfected or replaced before being used. Check with the

manufacturer for details.

8. Flush restroom faucets:
    - Cold Water Faucets*:* Run tap water until the water feels cold, 1 minute or more.
    - Hot Water Faucets*:* To clear hot water pipes of untreated water, turn on all hot water faucets and flush for a minimum of 15 minutes.

C.17 MDPH Post-Boil Order Instructions for Hospitals

POST BOIL WATER ORDER INSTRUCTIONS FOR HOSPITALS
May 4, 2010

Governor Deval Patrick has lifted the boil water order for all 30 communities east of Weston whose water service was affected by a rupture of the MetroWest Water Supply Tunnel on Saturday. Extensive testing has found water in these communities to be safe for the public. It should be noted that this boil water order was instituted as a precaution and not due to test results indicating definite contamination.

The Massachusetts Department of Public Health wants to remind healthcare facilities to review and implement all CDC Guidelines, as well as manufacturer instructions for specific pieces of clinical equipment immediately following a boil water order. A link to the CDC publication—Guidelines for Environmental Infection Control in Healthcare Facilities—is available at: http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_HCF_03.pdf

Each hospital should consult with their facility engineers and infection control representatives to develop a plan that is most appropriate to its situation. As a general rule, however, following a boil water order all healthcare facilities should implement the following steps:

- Corrective decontamination of the hot water system might be necessary after a disruption in service.
    - Decontaminate the system when the fewest occupants are present in the building (e.g., nights or weekends).
    - If using high-temperature decontamination, raise the hot-water temperature to 160°F– 170°F (71°C–77°C) and maintain that level while progressively flushing each outlet around the system for >5 minutes
    - Use a very thorough flushing of the water system instead of chlorination if a highly chlorine-resistant microorganism (e.g., *Cryptosporidium* spp.) is suspected as the water contaminant.
- Flush and restart equipment and fixtures according to manufacturers' instructions.
- Change the pretreatment filter and disinfect the dialysis water system with an EPA registered product to prevent colonization of the reverse osmosis membrane and downstream microbial contamination.
- Run water softeners through a regeneration cycle to restore their capacity and function.
- If the facility has a water-holding reservoir or water-storage tank, consult the facility engineer or local health department to determine whether this equipment needs to be drained, disinfected with an EPA-registered product, and refilled.

DPH guidance documents for the post-boil water order period for consumers and food establishments are available at http://www.mwra.state.ma.us/updates/leak.html.

If you have any questions related to the MWRA Water Emergency please contact the Emergency Preparedness Bureau by email at DPH.EmergencyPreparedness@state.ma.us

C.18 MDPH Post-Boil Order Instructions and Update for Dental Practices

Post-Boil Order Instructions and Update for Dental Practices
5/4/2010

Governor Deval Patrick has lifted the boil water order for all 30 communities east of Weston (including Saugus as of 6:40am) whose water service was interrupted by a rupture of the MetroWest Water Supply Tunnel on Saturday. Extensive testing has found water in these communities to be safe for the public.

Dental Practices are reminded to review and implement all CDC Guidelines as well as manufacturer instructions for dental offices immediately following a boil water order.

A link to the CDC that provides information for dental offices during and after a boil water order is available at:
http://www.cdc.gov/OralHealth/infectioncontrol/factsheets/boilwater.htm

Dentists should consult with the manufacturer of their dental unit or water delivery system to determine the best method for flushing dental unit water lines. All dental personnel should review and implement sections of the CDC's 2003 Guidelines for Infection Control in Dental Health Care Settings which concern Dental Unit Water Lines (DUWL) and the safe delivery of oral health care immediately following a boil water order at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm

General instructions for the Post-Boil Order issued by the Massachusetts Department of Public Health are available at http://www.mwra.state.ma.us/updates/leak.html.

If you have any questions relating to dental practice please contact the Board of Registration in Dentistry at 617-973-0970 or by email at dentistry.admin@state.ma.us.

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D. General Resources

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E. Media Sources

	Headline	Link
Arlington Advocate (Arlington, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/arlington/features/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/arlington/news/x1042476916/Tips-from-the-state-on-boil-water-orders
5/2/2010	MWRA issues boil water order	http://www.wickedlocal.com/arlington/news/x359583850/MWRA-issues-boil-water-order
5/3/2010	State faces questions on cause of pipe breach, status of backup project	http://www.wickedlocal.com/arlington/news/x359585849/State-faces-questions-on-cause-of-pipe-breach-status-of-backup-project
5/3/2010	Town to distribute water at St. Camillus Church between 5 and 8 p.m. today	http://www.wickedlocal.com/arlington/features/x1540368859/Town-to-distribute-water-between-5-and-8-p-m-today-location-to-be-announced
5/3/2010	Update on boil water order	http://www.wickedlocal.com/arlington/news/x755765094/Update-on-boil-water-order
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/arlington/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Residents advised to flush water after boil order lifted	http://www.wickedlocal.com/arlington/news/x359586394/Residents-advised-to-flush-water-after-boil-order-lifted
5/6/2010	MWRA set to vote on panel to investigate pipe breach	http://www.wickedlocal.com/arlington/town_info/government/x1035101031/MWRA-set-to-vote-on-panel-to-investigate-pipe-breach
5/6/2010	Letter: Consistently extraordinary	http://www.wickedlocal.com/arlington/news/opinions/x577132302/Letter-Consistently-extraordinary
5/6/2010	Letter: Welcome to the world	http://www.wickedlocal.com/arlington/news/opinions/x289802967/Letter-Welcome-to-the-world
5/7/2010	How would you rate town officials' reaction to the boil water order?	http://www.wickedlocal.com/arlington/homepage/x1560847762
5/18/2010	Town seeks to complete database for its resident alert system	http://www.wickedlocal.com/arlington/town_info/government/x1070008574/Town-seeks-to-complete-database-for-its-resident-alert-system

	Headline	Link
Associated Press (New York, NY)		
5/2/2010	Mass. water main break affects Boston, suburbs	
5/2/2010	Mayor: Boston schools open despite huge main break	
5/3/2010	Obama declares disaster in Mass. water main break	
5/3/2010	Water quality tests pending after Mass. main break	
5/4/2010	Mass. officials end boil water order for 2M people in Boston area affected by water main break.	
5/4/2010	Piece of broken Mass. water main eludes searchers	
5/4/2010	Mass. boil water order ends; investigation planned	
5/4/2010	Mass. vows probe into cause of water main break	
Belmont Citizen Herald (Belmont, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/belmont/newsnow/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/belmont/news/x1042476918/Tips-from-the-state-on-boil-water-orders
5/3/2010	State faces questions on cause of pipe breach, status of backup project	http://www.wickedlocal.com/belmont/news/x1042479275/State-faces-questions-on-cause-of-pipe-breach-status-of-backup-project
5/3/2010	Town of Belmont's boil water order still in effect	http://www.wickedlocal.com/belmont/features/x755765262/Town-of-Belmonts-boil-water-order-still-in-effect
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/belmont/newsnow/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil order lifted, Belmont water distribution cancelled	http://www.wickedlocal.com/belmont/news/x1042480127/Boil-order-lifted-Belmont-water-distribution-cancelled
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/belmont/newsnow/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Residents advised to flush water after boil order lifted	http://www.wickedlocal.com/belmont/news/x1406503003/Residents-advised-to-flush-water-after-boil-order-lifted
5/6/2010	MWRA set to vote on panel to investigate pipe breach	http://www.wickedlocal.com/belmont/newsnow/x1035101031/MWRA-set-to-vote-on-panel-to-investigate-pipe-breach

	Headline	Link
Belmont Patch (Belmont, MA)		
5/1/2010	Belmont Reacts to Boil Order	http://belmont.patch.com/articles/belmont-reacts-to-boil-order
5/1/2010	Belmont Under Boil Water Advisory	http://belmont.patch.com/articles/belmont-under-boil-water-advisory
5/2/2010	Week in Review April 25–May 1	http://belmont.patch.com/articles/week-in-review-april-25-may-1
5/2/2010	Free Water Brings Rush To Belmont High	http://belmont.patch.com/articles/free-water-brings-rush-to-belmont-high
5/3/2010	Free Water Tuesday at Town Yard	http://belmont.patch.com/articles/free-water-tuesday-at-town-yard-2
5/3/2010	Second Belmont Water Give Away Almost Certain	http://belmont.patch.com/articles/second-belmont-water-give-away-almost-certain
5/4/2010	State Lifts Boil Water Order	http://belmont.patch.com/articles/state-lifts-boil-water-order
5/9/2010	Week in Review May 2–May 8	http://belmont.patch.com/articles/week-in-review-may-2-may-8
5/13/2010	Water Emergency Put Belmont To the Test	http://belmont.patch.com/articles/water-emergency-put-belmont-to-the-test
Boston Globe (Boston, MA)		
5/2/2010	Residents, businesses race to adapt; water vanishes from stores	http://www.boston.com/news/local/massachusetts/articles/2010/05/02/residents_businesses_race_to_adapt_water_vanishes_from_stores/
5/2/2010	Workers repairing water pipe; Boil order still in effect for 2 million	http://www.boston.com/news/local/massachusetts/articles/2010/05/02/water_main_break/
5/2/2010	Fenway Frank maker postpones production	http://pqasb.pqarchiver.com/boston/access/2022999731.html?FMT = ABS&date = May+2%2C+2010
5/2/2010	A 'catastrophic' rupture hits region's water system	http://www.boston.com/news/local/massachusetts/articles/2010/05/02/a_catastrophic_rupture_hits_regions_water_system/
5/2/2010	Some questions you need answers to	http://www.boston.com/news/local/massachusetts/articles/2010/05/02/some_questions_you_need_answers_to/
5/2/2010	Tunnel failure came before backup could be finished	http://www.boston.com/news/local/massachusetts/articles/2010/05/02/tunnels_failure_catches_mwra_officials_off_guard/

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5/3/2010	Sudden break shows urgency of backup water system	http://pqasb.pqarchiver.com/boston/access/2023413661.html?FMT = ABS&date = May+3%2C+2010
5/3/2010	City becomes an oasis for those in search of untainted taps	http://www.boston.com/news/local/massachusetts/articles/2010/05/03/city_becomes_an_oasis_for_those_in_search_of_untainted_taps/
5/3/2010	Abruptly, making do becomes a new normal	http://pqasb.pqarchiver.com/boston/access/2023435331.html?FMT = ABS&date = May+3%2C+2010
5/3/2010	Hope of fix within days Pipe repair underway to restore clean-water flow to Greater Boston	http://pqasb.pqarchiver.com/boston/access/2023435321.html?FMT = ABS&date = May+3%2C+2010
5/3/2010	Chance of getting ill may be minuscule	http://www.boston.com/news/local/massachusetts/articles/2010/05/03/chance_of_getting_ill_may_be_minuscule/
5/3/2010	Wet behind the fears	http://www.boston.com/news/local/massachusetts/articles/2010/05/03/wet_behind_the_fears/
5/3/2010	Most area schools plan to open, operate as usual	http://www.boston.com/news/education/k_12/articles/2010/05/03/most_area_schools_plan_to_open_operate_as_usual/
5/3/2010	MGH staff calmly adjusts routines	http://www.boston.com/news/local/massachusetts/articles/2010/05/03/mgh_staff_calmly_rises_to_take_on_challenge/
5/4/2010	Boil, baby, boil	http://www.boston.com/bostonglobe/editorial_opinion/oped/articles/2010/05/04/boil_baby_boil/
5/4/2010	Bitterness flows from Western to Eastern Mass.	http://www.boston.com/bostonglobe/editorial_opinion/letters/articles/2010/05/04/bitterness_flows_from_western_to_eastern_mass/
5/4/2010	Stores try to obtain, maintain supply	http://pqasb.pqarchiver.com/boston/access/2023415941.html?FMT = ABS&date = May+3%2C+2010
5/4/2010	For some locations, Plan B is working	http://www.boston.com/yourtown/weston/articles/2010/05/04/for_some_locations_plan_b_is_working/
5/4/2010	Disruption a short-term affair	http://www.boston.com/business/articles/2010/05/04/businesses_likely_to_rebound_from_water_emergency/
5/4/2010	OK depends on water tests Boil order could be lifted by tomorrow	http://www.boston.com/news/local/massachusetts/articles/2010/05/04/with_repair_mwra_crisis_nears_an_end/
5/4/2010	Communities varied in offering bottled relief	http://www.boston.com/news/local/massachusetts/articles/2010/05/04/communities_varied_in_offering_bottled_relief/

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5/4/2010	Water emergency plan works, building confidence for future	http://www.boston.com/bostonglobe/editorial_opinion/editorials/articles/2010/05/04/water_emergency_plan_works_building_confidence_for_future/
5/5/2010	Winning seal of approval 2 welders worked 18 hours straight to fix water main	http://www.boston.com/yourtown/weston/articles/2010/05/05/2_welders_worked_18_hours_straight_to_fix_water_main/
5/5/2010	Ludicrous activism in eco-friendly Concord	http://www.boston.com/yourtown/weston/articles/2010/05/05/ludicrous_activism_in_eco_friendly_concord/
5/5/2010	Flow restored, answers sought	http://www.boston.com/yourtown/weston/articles/2010/05/05/flow_restored_mwra_hunting_for_answers/
5/5/2010	Long-honed alert system passes its test run	http://www.boston.com/news/local/massachusetts/articles/2010/05/05/as_test_run_for_disaster_alert_system_passed/
5/5/2010	Tests confirm it – water was OK to drink all weekend	http://www.boston.com/news/health/articles/2010/05/05/turns_out_water_was_ok_to_drink_after_all/
5/5/2010	Clean water cause to celebrate	http://www.boston.com/news/local/massachusetts/articles/2010/05/05/with_clean_water_newfound_appreciation_in_greater_boston/
5/6/2010	Water loss a crisis for some, an inconvenience for others	http://www.boston.com/yourtown/weston/articles/2010/05/06/water_main_break_a_crisis_for_some_mere_inconvenience_for_others/
5/6/2010	In a boil-water crisis, businesses kept their cool	http://www.boston.com/yourtown/weston/articles/2010/05/06/during_the_boil_water_crisis_businesses_south_of_boston_kept_their_cool/
5/6/2010	Laskey: Strong leadership amid water mess	http://www.boston.com/yourtown/weston/articles/2010/05/08/laskey_strong_leadership_amid_water_mess/
5/6/2010	Water woes end in smiles	http://www.boston.com/yourtown/marblehead/articles/2010/05/06/water_worries_north_of_boston_end_in_smiles_of_relief/
5/6/2010	Panel to investigate cause of pipe break	http://www.boston.com/yourtown/weston/articles/2010/05/06/independent_panel_to_investigate_break/
5/7/2010	Clamp used in 8 other projects	http://www.boston.com/yourtown/weston/articles/2010/05/07/clamp_used_in_8_other_projects/
5/8/2010	7 things the water crisis taught me	http://www.boston.com/bostonglobe/editorial_opinion/oped/articles/2010/05/08/7_things_the_water_crisis_taught_me/

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5/9/2010	Coupling was cited in other breaks	http://www.boston.com/yourtown/weston/articles/2010/05/09/coupling_was_cited_in_other_breaks/
5/9/2010	Raise a glass to job well done	http://www.boston.com/bostonglobe/editorial_opinion/letters/articles/2010/05/09/raise_a_glass_to_job_well_done/
5/9/2010	In water crisis, a call for reverse 911	http://www.boston.com/news/local/massachusetts/articles/2010/05/09/newton_reviews_lack_of_reverse_911_alert_system_during_recent_emergencies/
5/9/2010	Crisis? What crisis?	http://www.boston.com/bostonglobe/editorial_opinion/letters/articles/2010/05/09/crisis_what_crisis/
5/10/2010	High-profile failures raise worry	http://www.boston.com/yourtown/weston/articles/2010/05/10/failures_raise_questions_about_quality_of_big_projects/
5/13/2010	Frustrated crews continue search for missing clamp	http://www.boston.com/news/local/massachusetts/articles/2010/05/13/searchers_know_many_places_the_lost_water_main_clamp_isnt/
5/15/2010	MWRA to dig up ‚hot spots' found in coupling search	http://www.boston.com/yourtown/weston/articles/2010/05/15/mwra_to_dig_up_hot_spots_found_in_coupling_search/
5/20/2010	Group files complaint over water crisis	http://www.boston.com/news/local/massachusetts/articles/2010/05/20/group_files_complaint_over_water_crisis/
5/30/2010	Draining experience	http://www.boston.com/bostonglobe/magazine/articles/2010/05/30/draining_experience/
Boston Globe Business Updates (Boston, MA)		
5/3/2010	Dunkin' to give away free coffee tomorrow	http://www.boston.com/business/ticker/2010/05/dunkin_to_give.html
5/4/2010	Dunkin' coffee is brewing again	http://www.boston.com/business/ticker/2010/05/dunkin_coffee_i.html
5/4/2010	MWRA can financially weather crisis, Moody's says	http://www.boston.com/business/ticker/2010/05/mwra_can_financ.html
Boston Globe MetroDesk (Boston, MA)		
5/1/2010	List of communities affected by ‚boil-water' order	http://www.boston.com/news/local/breaking_news/2010/05/boiled_water_or.html
5/1/2010	Officials: Water should be boiled for at least a minute	http://www.boston.com/news/local/breaking_news/2010/05/officials_water.html

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5/1/2010	At one supermarket, hour long run on water clears shelves	http://www.boston.com/news/local/breaking_news/2010/05/at_one_supermar.html
5/1/2010	Owners urged to boil water for pets, too	http://www.boston.com/news/local/breaking_news/2010/05/owners_urged_to.html
5/1/2010	Taking the boil message to the streets	http://www.boston.com/news/local/breaking_news/2010/05/taking_the_boil.html
5/1/2010	On the streets of Boston, boil order seen as major inconvenience	http://www.boston.com/news/local/breaking_news/2010/05/at_a_boston_res.html
5/2/2010	Leak identified, repairs underway on 'catastrophic' water leak	http://www.boston.com/news/local/breaking_news/2010/05/repairs_underwa.html
5/2/2010	Coakley to review water price gouging allegations	http://www.boston.com/news/local/breaking_news/2010/05/demand_for_bott.html
5/2/2010	Workers repairing water pipe; Boil order still in effect for 2 million	http://www.boston.com/news/local/breaking_news/2010/05/workers_repairi.html
5/2/2010	Schools planning to open, with precautions, on Monday	http://www.boston.com/news/local/breaking_news/2010/05/schools_plannin_1.html
5/2/2010	Speaker DeLeo calls for pipe break hearings	http://www.boston.com/news/local/breaking_news/2010/05/speaker_deleo_c.html
5/3/2010	Saugus runs out of water as fresh supplies sent around region	http://www.boston.com/news/local/breaking_news/2010/05/new_shipments_o.html
5/3/2010	On campus in Boston, life is smelly, costly, and stressful	http://www.boston.com/news/local/breaking_news/2010/05/on_campus_the_w.html
5/3/2010	Voices from the water crisis	http://www.boston.com/news/local/breaking_news/2010/05/voices_from_the_2.html
5/3/2010	In Peabody, the water's fine – seriously	http://www.boston.com/news/local/breaking_news/2010/05/this_time_the_w.html
5/3/2010	Patrick says tests ‚going well,' but water crisis continues	http://www.boston.com/news/local/breaking_news/2010/05/pipe_tests_unde.html
5/4/2010	Text of Gov. Patrick's statement	http://www.boston.com/news/local/breaking_news/2010/05/governor_lifts.html
5/4/2010	How to get clean water running from your faucets	http://www.boston.com/news/local/breaking_news/2010/05/guidelines_for.html

	Headline	Link
5/4/2010	How to flush dirty water from your pipes	http://www.boston.com/news/local/breaking_news/2010/05/how_to_clean_yo.html
5/4/2010	From flowing faucets, a gush of relief	http://www.boston.com/news/local/breaking_news/2010/05/how_do_you_spel_3.html
5/4/2010	Gov. Patrick lifts boil order and the flushing begins	http://www.boston.com/news/local/breaking_news/2010/05/gov_patrick_lif.html
5/4/2010	Looking in the mud for clues to the Weston water main break	http://www.boston.com/news/local/breaking_news/2010/05/looking_in_the.html
5/5/2010	Gov. Patrick reiterates pledge to find cause of break	http://www.boston.com/news/local/breaking_news/2010/05/gov_patrick_ple_1.html
5/5/2010	Were water concerns unwarranted? Yes, but...	http://www.boston.com/news/local/breaking_news/2010/05/was_water_crisi.html
5/5/2010	Independent commission to investigate MWRA water leak	http://www.boston.com/news/local/breaking_news/2010/05/divers_back_in.html
5/6/2010	Eight projects under scrutiny by MWRA amid concerns about possible pipe flaws	http://www.boston.com/news/local/breaking_news/2010/05/dredging_operat.html
5/7/2010	The spurt that started it all	http://www.boston.com/news/local/breaking_news/2010/05/the_trickle_tha.html
5/7/2010	Search continues in Weston for water crisis clue	http://www.boston.com/news/local/breaking_news/2010/05/search_continue_9.html
5/12/2010	Still no sign of coupling that started water crisis	http://www.boston.com/news/local/breaking_news/2010/05/still_no_sign_o.html
5/14/2010	MWRA to check „hot spots' for missing coupling	http://www.boston.com/news/local/breaking_news/2010/05/mwra_to_check_h.html
5/25/2010	MWRA says water main break repairs have cost $572K	http://www.boston.com/news/local/breaking_news/2010/05/mwra_says_water.html
	Massachusetts water crisis	http://www.boston.com/news/local/massachusetts/specials/Water_crisis/
	The breach in Weston	http://www.boston.com/interactive/graphics/20100504_leak/

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Boston Herald (Boston, MA)		
5/2/2010	HUGE WATER PIPE BREAK IMPERILS REGION	http://pqasb.pqarchiver.com/bostonherald/access/2023312851.html?FMT = ABS&FMTS = ABS:FT&date = May+2%2C+2010&author = MARIE+SZANISLO%3BO%27RYAN+JOHNSON%3BKATY+JORDAN&pub = Boston+Herald&edition = &startpage = 2&desc = HUGE+WATER+PIPE+BREAK+IMPERILS+REGION
5/2/2010	HOW TO STAY SAFE DURING THE BOIL ORDER	http://pqasb.pqarchiver.com/bostonherald/access/2023312971.html?FMT = ABS&FMTS = ABS:FT&date = May+2%2C+2010&author = RENEE+DUDLEY%3BO%27RYAN+JOHNSON&pub = Boston+Herald&edition = &startpage = 2&desc = HOW+TO+STAY+SAFE+DURING+THE+BOIL+ORDER
5/2/2010	EATERIES SCRAMBLE FOR ICE, SUPPLIES	http://pqasb.pqarchiver.com/bostonherald/access/2023312901.html?FMT = ABS&FMTS = ABS:FT&date = May+2%2C+2010&author = RENEE+DUDLEY&pub = Boston+Herald&edition = &startpage = 3&desc = EATERIES+SCRAMBLE+FOR+ICE%2C+SUPPLIES
5/3/2010	Mass. vows probe into cause of water main break	http://www.bostonherald.com/news/regional/view/20100503mass_vows_probe_into_cause_of_water_main_break/
5/3/2010	WATER WOES LEAVE HUB BOILING	http://pqasb.pqarchiver.com/bostonherald/access/2023819101.html?FMT = ABS&FMTS = ABS:FT&date = May+3%2C+2010&author = JESSICA+VAN+SACK%3BEDWARD+MASON&pub = Boston+Herald&edition = &startpage = 4&desc = WATER+WOES+LEAVE+HUB+BOILING
5/3/2010	Customers left steaming about hard-to-find coffee	http://pqasb.pqarchiver.com/bostonherald/access/2023819071.html?FMT = ABS&FMTS = ABS:FT&date = May+3%2C+2010&author = JOE+FITZGERALD&pub = Boston+Herald&edition = &startpage = 4&desc = Customers+left+steaming+about+hard-to-find+coffee

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5/3/2010	What dirty water can do to you	http://pqasb.pqarchiver.com/bostonherald/access/2023819081.html?FMT = ABS&FMTS = ABS:FT&date = May+3%2C+2010&author = EDWARD+MASON&pub = Boston+Herald&edition = &startpage = 4&desc = What+dirty+water+can+do+to+you
5/4/2010	Biz takes a soaking sans java	http://pqasb.pqarchiver.com/bostonherald/access/2024550291.html?FMT = ABS&FMTS = ABS:FT&date = May+4%2C+2010&author = THOMAS+GRILLO&pub = Boston+Herald&edition = &startpage = 6&desc = Biz+takes+a+soaking+sans+java
5/4/2010	Water woes cut sports teams' drinks lineup	http://pqasb.pqarchiver.com/bostonherald/access/2024549991.html?FMT = ABS&FMTS = ABS:FT&date = May+4%2C+2010&author = JERRY+KRONENBERG&pub = Boston+Herald&edition = &startpage = 23&desc = Water+woes+cut+sports+teams%27+drinks+lineup
5/4/2010	TWITTER FINDS HUMOR IN STATE'S `AQUAPOCALYPSE'	http://pqasb.pqarchiver.com/bostonherald/access/2024549871.html?FMT = ABS&FMTS = ABS:FT&date = May+4%2C+2010&author = JOE+DWINELL&pub = Boston+Herald&edition = &startpage = 5&desc = TWITTER+FINDS+HUMOR+IN+STATE%27S+%60AQUAPOCALYPSE%27
5/4/2010	Op-Ed Aquapocalypse now; Only it needn't be	http://pqasb.pqarchiver.com/bostonherald/access/2024549981.html?FMT = ABS&FMTS = ABS:FT&date = May+4%2C+2010&author = MICHAEL+GRAHAM&pub = Boston+Herald&edition = &startpage = 21&desc = Op-Ed
5/4/2010	EDITORIAL Troubles `boil' over	http://pqasb.pqarchiver.com/bostonherald/access/2024550361.html?FMT = ABS&FMTS = ABS:FT&date = May+4%2C+2010&author = Anonymous&pub = Boston+Herald&edition = &startpage = 20&desc = EDITORIAL

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5/5/2010	Letters to the Editor	http://pqasb.pqarchiver.com/bostonherald/access/2025628411.html?FMT = CITE&FMTS = CITE:FT&date = May+5%2C+2010&author = Anonymous&pub = Boston+Herald&edition = &startpage = 20&desc = LETTERS+TO+THE+EDITOR
5/5/2010	DIVERS SEARCH CHARLES FOR CLUES	http://pqasb.pqarchiver.com/bostonherald/access/2025628461.html?FMT = ABS&FMTS = ABS:FT&date = May+5%2C+2010&author = Anonymous&pub = Boston+Herald&edition = &startpage = 6&desc = DIVERS+SEARCH+CHARLES+FOR+CLUES
5/5/2010	Bottle-battling moonbats drink up too	http://pqasb.pqarchiver.com/bostonherald/access/2025628331.html?FMT = ABS&FMTS = ABS:FT&date = May+5%2C+2010&author = HOWIE+CARR&pub = Boston+Herald&edition = &startpage = 6&desc = Bottle-battling+moonbats+drink+up+too
5/7/2010	Other projects eyed after Weston break	http://pqasb.pqarchiver.com/bostonherald/access/2027717091.html?FMT = ABS&FMTS = ABS:FT&date = May+7%2C+2010&author = RICHARD+WEIR&pub = Boston+Herald&edition = &startpage = 8&desc = Other+projects+eyed+after+Weston+break
5/13/2010	MWRA FINDS MORE RISKY BOLTS	http://pqasb.pqarchiver.com/bostonherald/access/2032618071.html?FMT = ABS&FMTS = ABS:FT&date = May+13%2C+2010&author = RICHARD+WEIR&pub = Boston+Herald&edition = &startpage = 3&desc = MWRA+FINDS+MORE+RISKY+BOLTS
5/26/2010	Rising tide of bills for MWRA	http://pqasb.pqarchiver.com/bostonherald/access/2042665541.html?FMT = ABS&FMTS = ABS:FT&date = May+26%2C+2010&author = LAURA+CRIMALDI%3BEDWARD+MASON&pub = Boston+Herald&edition = &startpage = 4&desc = Rising+tide+of+bills+for+MWRA

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5/26/2010	E-mails show flood of worry, then kudos	http://pqasb.pqarchiver.com/bostonherald/access/2042665161.html?FMT = ABS&FMTS = ABS:FT&date = May+26%2C+2010&author = LAURA+CRIMALDI&pub = Boston+Herald&edition = &startpage = 4&desc = E-mails+show+flood+of+worry%2C+then+kudos
5/29/2010	Water crisis OT tab totaled $135G	http://pqasb.pqarchiver.com/bostonherald/access/2045061801.html?FMT = ABS&FMTS = ABS:FT&date = May+29%2C+2010&author = LAURA+CRIMALDI&pub = Boston+Herald&edition = &startpage = 8&desc = Water+crisis+OT+tab+totaled+%24135G
Brookline Tab (Brookline, MA)		
5/1/2010	MWRA: Water main break is causing 8 million gallons of water an hour to spill into Charles River	http://www.wickedlocal.com/brookline/homepage/x826101717/MWRA-Water-main-break-is-causing-8-million-gallons-of-water-an-hour-to-spill-into-Charles-River
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/brookline/news/x1042476920/Tips-from-the-state-on-boil-water-orders
5/1/2010	Brookline residents strip shelves of bottled water following boil water order	http://www.wickedlocal.com/brookline/archive/x1406499957/Brookline-residents-strip-shelves-of-bottled-water-following-boil-water-order
5/2/2010	PHOTOS and VIDEO: MWRA water main break in Weston	http://www.wickedlocal.com/brookline/news/x1406500323/PHOTOS-and-VIDEO-MWRA-water-main-break-in-Weston
5/3/2010	President Obama signs Massachusetts emergency disaster declaration	http://www.wickedlocal.com/brookline/homepage/x1042478879/President-Obama-signs-Massachusetts-emergency-disaster-declaration
5/3/2010	Beware of price gouging	http://www.wickedlocal.com/brookline/news/x755765390/Beware-of-price-gouging
5/3/2010	Brookline ice demand continues to soar during drinking water ban	http://www.wickedlocal.com/brookline/news/business/x826104400/Brookline-bars-and-restaurants-adapting-to-water-drinking-ban
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/brookline/homepage/x1540368420/Water-pipe-fixed-Drinking-water-still-not-safe

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5/3/2010	Water undergoing tests as Brookline distributes bottled water to residents	http://www.wickedlocal.com/brookline/features/x1042478145/Brookline-to-distribute-water-to-seniors-schools
5/3/2010	Brookline to distribute bottled water at 4 p.m. today	http://www.wickedlocal.com/brookline/breaking/x1042478377/Brookline-to-distribute-bottled-water-at-4-p-m-today
5/3/2010	Water ban forcing some Brookline dentists to cancel appointments	http://www.wickedlocal.com/brookline/news/lifestyle/health/x359585030/Water-ban-forcing-some-Brookline-dentists-to-cancel-appointments
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/brookline/breaking/x1406500954/Water-pipe-fixed-Drinking-water-still-not-safe
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/brookline/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil-water order lifted for Boston area	http://www.wickedlocal.com/brookline/breaking/x826105066/Boil-water-order-lifted-for-Boston-area
5/4/2010	Brookline health director: Water distribution „smooth as silk'	http://www.wickedlocal.com/brookline/news/lifestyle/health/x1540371150/Brookline-health-director-Water-distribution-smooth-as-silk
5/4/2010	No refund for customers after water crisis	http://www.wickedlocal.com/brookline/news/x1042481097/No-refund-for-customers-after-water-crisis
5/4/2010	Governor Patrick promises accountability after "boil water" order lifted	http://www.wickedlocal.com/brookline/homepage/x1406503205/Governor-Patrick-promises-accountability-after-boil-water-order-lifted
5/6/2010	New panel launches look into state's water system	http://www.wickedlocal.com/brookline/town_info/government/x1035101299/New-panel-launches-look-into-states-water-system
Canton Journal (Canton, MA)		
5/1/2010	Massive water main break requires widespread boil-water order	http://www.wickedlocal.com/canton/topstories/x1406499623/Massive-water-main-break-requires-widespread-boil-water-order
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/canton/news/x1042476922/Tips-from-the-state-on-boil-water-orders
5/2/2010	Patrick, local officials: Drinking water to be restored within days	http://www.wickedlocal.com/canton/news/x755764668/Patrick-local-officials-Drinking-water-to-be-restored-within-days
5/2/2010	Water fountains in Canton schools shut down	http://www.wickedlocal.com/canton/archive/x1042477467/Water-fountains-in-Canton-schools-shut-down

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5/2/2010	Stoughton residents deal with water situation	http://www.wickedlocal.com/canton/topstories/x1540367814/Stoughton-residents-deal-with-water-situation
5/2/2010	Boil-water order remains in effect for 28 communities including Canton	http://www.wickedlocal.com/canton/features/x755764403/Boil-water-order-remains-in-effect-for-28-communities-in-eastern-Massachusetts
5/3/2010	President signs water Emergency Disaster Declaration	http://www.wickedlocal.com/canton/news/x1042478802/President-signs-water-Emergency-Disaster-Declaration
5/3/2010	Quincy, Milton, Canton schools open, taking precautions with water	http://www.wickedlocal.com/canton/news/x359584494/Quincy-Milton-Canton-schools-open-taking-precautions-with-water
5/4/2010	VIDEOS: Testing key after water-main break	http://www.wickedlocal.com/canton/features/x359587791/VIDEOS-Testing-key-after-water-main-break
5/4/2010	Canton schools remained open but took precautions	http://www.wickedlocal.com/canton/news/education/x1540371739/Canton-schools-remained-open-but-took-precautions
5/4/2010	Boil-water order lifted for Canton and other MWRA towns	http://www.wickedlocal.com/canton/breaking/x1042480285/Boil-water-order-lifted-for-Canton-and-other-MWRA-towns
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/canton/archive/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Canton company could be key to MWRA accident	http://www.wickedlocal.com/canton/features/x1042481758/Canton-company-could-be-key-to-MWRA-accident
5/6/2010	New commission to study state's water system needs	http://www.wickedlocal.com/canton/news/x289802499/New-commission-to-study-states-water-system-needs
5/6/2010	Learning to cope without the tap	http://www.wickedlocal.com/canton/news/x2084230447/Learning-to-cope-without-the-tap
5/14/2010	LETTER TO THE EDITOR: Great job by MWRA	http://www.wickedlocal.com/canton/news/opinions/letters/x1381046186/LETTER-TO-THE-EDITOR-Great-job-by-MWRA
Chelsea Record (Chelsea, MA)		
5/8/2010	City's reaction to water crisis	http://www.chelsearecord.com/2010/05/08/citys-reaction-to-water-crisis/

	Headline	Link
Daily Free Press (Boston University, Boston, MA)		
5/1/2010	"Boil water" alert issued in Boston after water main break	http://www.dailyfreepress.com/news/boil-water-alert-issued-in-boston-after-water-main-break-1.2256620
5/2/2010	Repairs underway as state grapples with undrinkable water	http://www.dailyfreepress.com/repairs-underway-as-state-grapples-with-undrinkable-water-1.2256736
5/4/2010	Patrick lifts boil order on tap water	http://www.dailyfreepress.com/patrick-lifts-boil-order-on-tap-water-1.2258438
Dedham Transcript (Dedham, MA)		
5/2/2010	MWRA: Water main break is causing 8 million gallons of water an hour to spill into Charles River	http://www.dailynewstranscript.com/topstories/x826101717/MWRA-Water-main-break-is-causing-8-million-gallons-of-water-an-hour-to-spill-into-Charles-River
5/3/2010	President Obama signs Massachusetts emergency disaster declaration	http://www.dailynewstranscript.com/archive/x1042478879/President-Obama-signs-Massachusetts-emergency-disaster-declaration
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.dailynewstranscript.com/news/x1042479787/Boil-water-order-lifted-for-Boston-area
5/5/2010	Editorial: New water tunnel needs a fresh look	http://www.dailynewstranscript.com/opinions/editorials/x1195010572/Editorial-New-water-tunnel-needs-a-fresh-look
Enterprise (Brockton, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.enterprisenews.com/topstories/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	MWRA boil-water order includes Quincy, Milton, Canton, Stoughton	http://www.enterprisenews.com/breaking/x359583210/MWRA-boil-water-order-includes-Quincy-Milton-Canton-Stoughton
5/1/2010	Tips from the state on boil-water orders	http://www.enterprisenews.com/lifestyle/health_and_beauty/x755764211/Tips-from-the-state-on-boil-water-orders
5/2/2010	Boil-water order for Stoughton was a false alarm	http://www.enterprisenews.com/business/x1195009804/Stoughton-stocks-up-on-bottled-water-in-face-of-boil-order-Boil-order-causes-run-on-stores
5/2/2010	Water main break affects Boston, suburbs; Gov. Patrick declares state of emergency	http://www.enterprisenews.com/topstories/x826102326/Water-main-break-affects-Boston-suburbs-Gov-Patrick-declares-state-of-emergency

	Headline	Link
5/2/2010	POLL: End to water emergency in sight	http://www.enterprisenews.com/news/x1406500479/Quincy-begins-distributing-bottled-water-to-patient-residents
5/2/2010	Water selling quickly out of Brockton stores	http://www.enterprisenews.com/news/x1195009902/Water-selling-quickly-out-of-Brockton-stores
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.enterprisenews.com/archive/x1406500245/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/3/2010	VIDEOS: Testing key after water-main break	http://www.enterprisenews.com/news/x1195010090/Quincy-will-distribute-more-free-bottled-water-to-residents-Monday
5/3/2010	Obama declares emergency to help state with water crisis recovery	http://www.enterprisenews.com/news/x1195010136/Obama-declares-emergency-to-help-state-with-water-crisis-recovery
5/3/2010	Granlund cartoon: On the Boston-area water emergency	http://www.enterprisenews.com/opinions/cartoons/x755765209/Granlund-cartoon-On-the-Boston-area-water-emergency
5/3/2010	Pipe fixed, clean water on the way to Boston area	http://www.enterprisenews.com/features/x359583792/Boil-water-order-remains-in-effect-for-28-communities-in-eastern-Massachusetts
5/3/2010	MWRA: Stoughton water untainted	http://www.enterprisenews.com/business/x1195010026/MWRA-Stoughton-water-untainted
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.enterprisenews.com/archive/x1042479787/Boil-water-order-lifted-for-Boston-area
5/7/2010	Water authority to inspect pipes to head off future breaks	http://www.enterprisenews.com/news/state_news/x577133512/Water-authority-to-inspect-pipes-to-head-off-future-breaks
5/11/2010	A GOOD AGE: Quincy's free water irks readers	http://www.enterprisenews.com/news/x1773730793/A-Good-Age-Free-bottled-water-in-Quincy-irks-readers
Everett Independent (Everett, MA)		
5/8/2010	City distributes nearly 10,000 gallons of water to residents; cooperative effort a big success	http://www.everettindependent.com/2010/05/08/city-distributes-nearly-10000-gallons-of-water-to-residents-cooperative-effort-a-big-success/
5/8/2010	The water crisis and response	http://www.everettindependent.com/2010/05/08/the-water-crisis-and-response/
5/12/2010	We agree with the mayor	http://www.everettindependent.com/2010/05/12/we-agree-with-the-mayor/

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Fox Broadcasting Company (Boston, MA)		
5/1/2010	Restaurants, residents react to boil water order	http://www.myfoxboston.com/dpp/news/local/restaurants-residents-react-to-boil-water-order-20100501
5/1/2010	Boil water order issued for region	http://www.myfoxboston.com/dpp/news/local/massive-water-main-break-affects-38-towns-25-apx-20100501
5/2/2010	Menino: Schools open despite huge water main break	http://www.myfoxboston.com/dpp/news/local/menino-schools-open-despite-huge-water-main-break-25-apx-20100502
5/3/2010	President declares state of emergency in Massachusetts	http://www.myfoxboston.com/dpp/news/local/president-declares-state-of-emergency-in-massachusetts-25-apx-20100503
5/3/2010	Mass. vows investigation into water main break	http://www.myfoxboston.com/dpp/news/local/mass-vows-investigation-into-water-main-break-25-apx-20100503
5/3/2010	Water crisis boosting Deval Patrick's image	http://www.myfoxboston.com/dpp/news/politics/local_politics/water-crisis-boosting-deval-patricks-image-20100503
5/4/2010	Boil water order for last Boston suburb lifted	http://www.myfoxboston.com/dpp/news/local/governor-deval-patrick-lifts-boil-water-order-for-29-out-of-30-communities-25-apx-20100504
5/4/2010	Massachusetts divers don't find section of pipe	http://www.myfoxboston.com/dpp/news/local/massachusetts-divers-dont-find-section-of-pipe-25-apx-20100504
5/4/2010	Were we wimpy about water?	http://www.myfoxboston.com/dpp/news/local/were-we-wimpy-about-water-20100504
5/5/2010	Officials searching for clues to water main breach	http://www.myfoxboston.com/dpp/news/local/officials-searching-for-clues-to-water-main-breach-25-apx-20100505
5/6/2010	Officials to inspect 8 water pipe couplings	http://www.myfoxboston.com/dpp/news/local/officials-to-inspect-8-water-pipe-couplings-25-apx-20100506
5/19/2010	Disabilities group files suit over water main break	http://www.myfoxboston.com/dpp/news/local/disabilities-group-files-suit-over-water-main-break-25-apx-20100519
5/26/2010	Bill for Boston water main break at $600,000	http://www.myfoxboston.com/dpp/news/local/bill-for-boston-water-main-break-at-600000-25-apx-20100526

	Headline	Link
Lexington Minuteman (Lexington, MA)		
5/1/2010	Boil water order issued for Lexington due to water main break	http://www.wickedlocal.com/lexington/news/x1540367184/Boil-water-order-issued-for-Lexington-due-to-water-main-break-in-Weston
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/lexington/newsnow/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/lexington/news/x1042476924/Tips-from-the-state-on-boil-water-orders
5/3/2010	Lexington businesses thirsting for answers after forced closures	http://www.wickedlocal.com/lexington/news/business/x826104215/Lexington-businesses-thirsting-for-answers-after-forced-closures
5/3/2010	POLL: Was the town right to close down restaurants?	http://www.wickedlocal.com/lexington/newsnow/x1042479207/POLL-Was-the-town-right-do-close-down-restaurants-after-the-water-main-break
5/3/2010	Was the town right to close down restaurants after the water main break?	
5/3/2010	Water main repaired, but boil water order remains	http://www.wickedlocal.com/lexington/features/x1406501121/Water-main-repaired-but-boil-water-order-remains
5/3/2010	Town to distribute bottled water to Lexington residents	http://www.wickedlocal.com/lexington/news/x1042479098/Town-to-distribute-bottled-water-to-Lexington-residents
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/lexington/newsnow/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Governor lifts boil water order	http://www.wickedlocal.com/lexington/features/x1540370473/Governor-lifts-boil-water-order
5/5/2010	Lexington responds to water crisis	http://www.wickedlocal.com/lexington/news/x1560845518/Lexington-responds-to-water-crisis
5/6/2010	Editorial: For businesses, forced closures hard to swallow	http://www.wickedlocal.com/lexington/news/opinions/x1920409695/Editorial-For-businesses-forced-closures-hard-to-swallow
5/6/2010	Bohart: Disregard shown toward restaurants	http://www.wickedlocal.com/lexington/news/opinions/x1381030586/Bohart-Disregard-shown-toward-restaurants
5/14/2010	Lexington police interrupt wedding, fundraiser during water crisis	http://www.wickedlocal.com/lexington/news/x289816217/Lexington-police-interrupt-wedding-fundraiser-during-water-crisis

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Malden Observer (Malden, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/malden/features/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	Boil order issued for Malden drinking water supply	http://www.wickedlocal.com/malden/news/x826101771/Boil-order-issued-for-Malden-drinking-water-supply
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/malden/news/x1042476926/Tips-from-the-state-on-boil-water-orders
5/3/2010	Free water distribution in Malden	http://www.wickedlocal.com/malden/photos/x1540369899/Free-water-distribution-in-Malden
5/3/2010	Malden continues water distribution to residents	http://www.wickedlocal.com/malden/features/x1042478966/Malden-continues-water-distribution-to-residents
5/3/2010	MASS. WATER CRISIS: Drinking water likely to return in ‚next few days'	http://www.wickedlocal.com/malden/news/x755765106/MASS-WATER-CRISIS-Drinking-water-likely-to-return-in-next-few-days
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/malden/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Gov. Patrick lifts boil order	http://www.wickedlocal.com/malden/breaking/x755767273/Gov-Patrick-lifts-boil-order
5/4/2010	Tips for making sure your drinking water is safe	http://www.wickedlocal.com/malden/news/x1042479998/Tips-for-making-sure-your-drinking-water-is-safe
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/malden/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/6/2010	Water woes: City spent $12K during boil order	http://www.wickedlocal.com/malden/highlight/x1920410107/Water-woes-City-spent-12K-during-boil-order
Marblehead Reporter (Marblehead, MA)		
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/marblehead/news/x1042476928/Tips-from-the-state-on-boil-water-orders
5/2/2010	Boil-water order still in effect; click for fact sheet	http://www.wickedlocal.com/marblehead/news/x826102405/Boil-water-order-still-in-effect-click-for-fact-sheet
5/3/2010	MASS. WATER CRISIS: In Marblehead, a bit of mayhem but mostly just muddling through	http://www.wickedlocal.com/marblehead/features/x1042478808/Marblehead-water-distribution-center-doing-brisk-business

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5/3/2010	MASS. WATER CRISIS: Officials won't put date on return of drinkable water; repairs under way	http://www.wickedlocal.com/marblehead/town_info/government/x1540368456/MASS-WATER-CRISIS-Officials-wont-put-date-on-return-of-drinkable-water-repairs-under-way
5/3/2010	MASS. WATER CRISIS: Drinking water likely to return in „next few days'	http://www.wickedlocal.com/marblehead/news/x755765082/MASS-WATER-CRISIS-Drinking-water-likely-to-return-in-next-few-days
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/marblehead/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil-water order lifted; pipes must be flushed	http://www.wickedlocal.com/marblehead/breaking/x755767101/Boil-water-order-lifted-pipes-must-be-flushed
5/7/2010	LETTER: Shame on some who took water „handout'	http://www.wickedlocal.com/marblehead/news/opinions/letters/x289804221/LETTER-Shame-on-some-who-took-water-handout
5/9/2010	LETTER: Devereux House grateful for emergency response	http://www.wickedlocal.com/marblehead/news/opinions/letters/x968907329/LETTER-Devereux-House-grateful-for-emergency-response
5/24/2010	LETTER: Our tax dollars paid for that water	http://www.wickedlocal.com/marblehead/news/opinions/letters/x1070024028/LETTER-Our-tax-dollars-paid-for-that-water
Medford Transcript (Medford, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/medford/features/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	Boil order issued for Medford drinking water supply	http://www.wickedlocal.com/medford/breaking/x755763845/Boil-order-issued-for-Medford-drinking-water-supply
5/3/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/medford/news/x1042476930/Tips-from-the-state-on-boil-water-orders
5/3/2010	Medford officials, schools respond to water-boil order	http://www.wickedlocal.com/medford/breaking/x1540369464/Medford-officials-schools-respond-to-water-boil-order
5/3/2010	Medford businesses grapple with water crisis	http://www.wickedlocal.com/medford/news/business/x359585491/Medford-business-grapple-with-water-crisis

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5/3/2010	„Business as usual' at Lawrence Memorial, despite water woes	http://www.wickedlocal.com/medford/news/lifestyle/health/x826103986/Business-as-usual-at-Lawrence-Memorial-despite-water-woes
5/3/2010	MASS. WATER CRISIS: Drinking water likely to return in „next few days'	http://www.wickedlocal.com/medford/breaking/x359584581/MASS-WATER-CRISIS-Drinking-water-likely-to-return-in-next-few-days
5/3/2010	MASS. WATER CRISIS: Officials won't put date on return of drinkable water; repairs under way	http://www.wickedlocal.com/medford/town_info/government/x826102940/MASS-WATER-CRISIS-Officials-wont-put-date-on-return-of-drinkable-water-repairs-under-way
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/medford/features/x1042479787/Boil-water-order-lifted-for-Boston-area
Melrose Free Press (Melrose, MA)		
5/1/2010	MWRA WATER MAIN BREAK: Boil order still in effect for Melrose drinking water	http://www.wickedlocal.com/melrose/breaking/x1540367176/Boil-order-issued-for-Malden-drinking-water-supply
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/melrose/features/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/2/2010	Melrose to receive water from National Guard; local grocers try to maintain supply of bottled water	http://www.wickedlocal.com/melrose/breaking/x359583971/Melrose-to-receive-water-from-National-Guard-Local-grocers-trying-to-maintain-supplies-of-water-as-well
5/5/2010	MELROSE FREE PRESS EDITORIAL: Water, water everywhere …	http://www.wickedlocal.com/melrose/opinions/editorial/x1381028844/MELROSE-FREE-PRESS-EDITORIAL-Water-water-everywhere
Metro West Daily News (Framingham, MA)		
5/1/2010	Water main break affects 31 Greater Boston, suburbs	http://www.metrowestdailynews.com/news/x1042476635/Water-main-break-affects-31-Greater-Boston-suburbs
5/2/2010	PHOTOS: Water main break in Weston	http://www.metrowestdailynews.com/features/x1042477227/PHOTOS-Water-main-break-in-Weston
5/2/2010	Catastrophic water main break leads to State of Emergency	http://www.metrowestdailynews.com/news/x1195009824/Catastrophic-water-main-break-leads-to-State-of-Emergency
5/4/2010	State vows to probe cause of MWRA water main break	http://www.metrowestdailynews.com/features/x1195010352/State-vows-to-probe-cause-of-MWRA-water-main-break

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5/5/2010	Editorial: New water tunnel needs a fresh look	http://www.metrowestdailynews.com/opinions/editorials/x1195010572/Editorial-New-water-tunnel-needs-a-fresh-look
5/26/2010	Wentworth Institute president named to head probe into MWRA water main break	http://www.metrowestdailynews.com/news/x599315797/Wentworth-Institute-president-named-to-head-probe-into-MWRA-water-main-break
6/9/2010	No luck finding key coupling in MWRA water main break	http://www.metrowestdailynews.com/news/x2023189713/No-luck-finding-key-coupling-in-MWRA-water-main-break
6/18/2010	Small piece of failed MWRA water coupling found	http://www.metrowestdailynews.com/news/x1501905683/Small-piece-of-failed-MWRA-water-coupling-found
7/14/2010	Broken rubber gasket may have caused May 1 water main break	http://www.metrowestdailynews.com/news/x1849236057/Broken-rubber-gasket-may-have-caused-May-1-water-main-break
7/15/2010	MWRA locates elusive coupling blamed for water main break	http://www.metrowestdailynews.com/highlight/x1005402827/MWRA-locates-elusive-coupling-blamed-for-water-main-break
Milton Times (Milton, MA)		
5/6/2010	Town Rides Out Emergency Water Ban	http://www.miltontimes.com/DOTnet-frontJUMPS-RidesOut.html
New England Cable News (Newton, MA)		
5/1/2010	Boil water order lifted for all 30 Mass. communities; click for latest updates	http://www.necn.com/pages/landing?blockID = 227005
5/1/2010	' Catastrophic' water pipe leak forces boil water order	http://www.necn.com/pages/landing?blockID = 227052
5/1/2010	Gov. Patrick declares state of emergency	http://www.necn.com/pages/landing?blockID = 227055
5/1/2010	Store shelves run dry of bottled water	http://www.necn.com/pages/landing?blockID = 227142
5/1/2010	Weston water pipe, catastrophically failing'	http://www.necn.com/pages/landing?blockID = 227061
5/1/2010	Boston under state of emergency	http://www.necn.com/pages/landing?blockID = 227075
5/1/2010	Boil water order: What you need to know	http://www.necn.com/pages/landing?blockID = 227079
5/1/2010	A rush on bottled water	http://www.necn.com/pages/landing?blockID = 227094
5/1/2010	The crack that started it all	http://www.necn.com/pages/landing?blockID = 227131
5/2/2010	Mass. officials address water crisis in Weston	http://www.necn.com/pages/landing?blockID = 227324
5/2/2010	Mass. National Guard sets up water distribution center	http://www.necn.com/pages/landing?blockID = 227336
5/2/2010	Weston water main break not worst-case	http://www.necn.com/pages/landing?blockID = 227412
5/2/2010	Water breach recovery likely in „days, not weeks'	http://www.necn.com/pages/landing?blockID = 227439

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5/2/2010	No specific timetable on end to boil water order	http://www.necn.com/pages/landing?blockID = 227442
5/2/2010	Crews working into night to repair coupling	http://www.necn.com/pages/landing?blockID = 227523
5/2/2010	Crews race to fix break in Boston's water supply	http://www.necn.com/pages/landing?blockID = 227281
5/2/2010	Crews work to repair metal collar in Weston	http://www.necn.com/pages/landing?blockID = 227304
5/2/2010	Boil order remains in effect for 30 Mass. communities	http://www.necn.com/pages/landing?blockID = 227340
5/2/2010	MWRA's goal: Have Weston pipe repaired Sunday night	http://www.necn.com/pages/landing?blockID = 227401
5/2/2010	The scramble for bottled water	http://www.necn.com/pages/landing?blockID = 227419
5/2/2010	Boston Public Schools in session Monday	http://www.necn.com/pages/landing?blockID = 227428
5/2/2010	Lost business for Lexington restaurants	http://www.necn.com/pages/landing?blockID = 227478
5/3/2010	Water pipe successfully repaired in Massachusetts	http://www.necn.com/05/03/10/Water-pipe-successfully-repaired-in-Mass/landing_newengland.html?blockID = 227642&feedID = 4206
5/3/2010	Crews complete welding in Weston	http://www.necn.com/pages/landing?blockID = 227599
5/3/2010	Mass officials test and purge water system	http://www.necn.com/pages/landing?blockID = 227619
5/3/2010	Bottled water is a hot commodity in Massachusetts	http://www.necn.com/pages/landing?blockID = 227655
5/3/2010	Water emergency turns into coffee crisis!	http://www.necn.com/pages/landing?blockID = 227664
5/3/2010	Obama signs emergency disaster declaration for Massachusetts	http://www.necn.com/pages/landing?blockID = 227878
5/3/2010	Poland Spring working around the clock to get water where needed most	http://www.necn.com/pages/landing?blockID = 227957
5/3/2010	Community Health: Water emergency	http://www.necn.com/pages/landing?blockID = 227995
5/3/2010	Braude Beat: Boston water emergency	http://www.necn.com/pages/landing?blockID = 228025
5/3/2010	Water main break raises concerns in Central Mass	http://www.necn.com/pages/landing?blockID = 228027
5/3/2010	Harpoon Brewery maintains production despite water main break	http://www.necn.com/pages/landing?blockID = 228074
5/3/2010	Broadside: Surviving the water emergency	http://www.necn.com/pages/landing?blockID = 228077
5/3/2010	Who's to blame for the water main break?	http://www.necn.com/pages/landing?blockID = 228078
5/3/2010	Boil water order affects sporting events in Boston	http://www.necn.com/pages/landing?blockID = 228104
5/3/2010	Officials continue to test water in Mass.	http://www.necn.com/pages/landing?blockID = 228111
5/3/2010	Bottled water distribution for Saugus residents	http://www.necn.com/pages/landing?blockID = 227612
5/3/2010	Water pipe successfully repaired in Massachusetts	http://www.necn.com/pages/landing?blockID = 227642
5/3/2010	Stress tests on repaired water pipe in Mass. successful	http://www.necn.com/pages/landing?blockID = 227801
5/3/2010	Massachusetts hospitals were prepared for water emergency	http://www.necn.com/pages/landing?blockID = 227939

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5/4/2010	Mass. Gov. Patrick news conference: Boil water order lifted for all 30 Mass. communities	http://www.necn.com/pages/landing?blockID = 228359
5/4/2010	Boil water order lifted; follow these steps to make your water safe again	http://www.necn.com/pages/landing?blockID = 228376
5/4/2010	Boston Globe: Massachusetts governor promises full investigation into water main break	http://www.necn.com/pages/landing?blockID = 228728
5/4/2010	Polar Beverages went into action during water crisis	http://www.necn.com/pages/landing?blockID = 228834
5/4/2010	Gov. Patrick takes center stage in water crisis	http://www.necn.com/pages/landing?blockID = 228840
5/4/2010	What you need to do to use your water again	http://www.necn.com/pages/landing?blockID = 228328
5/4/2010	Divers search Charles River for pieces of pipe	http://www.necn.com/pages/landing?blockID = 228499
5/5/2010	Piece of broken Weston water main eludes searchers	http://www.necn.com/pages/landing?blockID = 229126
5/5/2010	Divers come up empty, return to Charles River	http://www.necn.com/pages/landing?blockID = 229164
5/5/2010	Divers search Charles River for clues in water main break	http://www.necn.com/pages/landing?blockID = 229190
5/5/2010	Boston Globe: Emergency officials happy with how water crisis was handled	http://www.necn.com/pages/landing?blockID = 229202
5/5/2010	Search resumes for missing pipe after water crisis in Massachusetts	http://www.necn.com/pages/landing?blockID = 229358
5/5/2010	Boston Globe: Water was OK to drink all weekend	http://www.necn.com/pages/landing?blockID = 229472
5/6/2010	Affairs of State: Mass. state commission to look at ways to fix water system	http://www.necn.com/pages/landing?blockID = 230138
5/6/2010	Underneath it all: Inside Boston's sewer system	http://www.necn.com/pages/landing?blockID = 230307
5/6/2010	Mass. officials to inspect eight water pipe couplings	http://www.necn.com/pages/landing?blockID = 230044
5/9/2010	Clamps cited in other Mass. water breaks	http://www.necn.com/pages/landing?blockID = 231521
New York Times (New York, NY)		
5/2/2010	Ruptured Pipe Cuts Water in Boston	http://www.nytimes.com/2010/05/03/us/03boston.html
Newton Tab (Newton, MA)		
5/1/2010	MWRA: Water main break is causing 8 million gallons of water an hour to spill into Charles River	http://www.wickedlocal.com/newton/topstories/x826101717/MWRA-Water-main-break-is-causing-8-million-gallons-of-water-an-hour-to-spill-into-Charles-River
5/1/2010	Water main break affects 31 Greater Boston, suburbs	http://www.wickedlocal.com/newton/news/x1540367299/Water-main-break-affects-31-Greater-Boston-suburbs

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5/2/2010	Boil-water order remains in effect, but progress reported on water main break	http://www.wickedlocal.com/newton/features/x826102588/Boil-water-order-remains-in-effect-but-progress-reported-on-water-main-break
5/2/2010	PHOTOS and VIDEO: MWRA water main break in Weston	http://www.wickedlocal.com/newton/news/x359583911/PHOTOS-Water-main-break-in-Weston
5/3/2010	President Obama signs Massachusetts emergency disaster declaration	http://www.wickedlocal.com/newton/topstories/x1042478879/President-Obama-signs-Massachusetts-emergency-disaster-declaration
5/3/2010	Newton pet store waters down parched pooches	http://www.wickedlocal.com/newton/features/x1042479132/Newton-pet-store-waters-down-parched-pooches
5/3/2010	Newton Senior Center delivering water to homes	http://www.wickedlocal.com/newton/news/x1406501822/Newton-Senior-Center-delivering-water-to-homes
5/3/2010	Water woes don't affect Newton dentists	http://www.wickedlocal.com/newton/features/x1042479139/Water-woes-dont-affect-Newton-dentists
5/3/2010	Be the first to know when the boil water order is over	http://www.wickedlocal.com/newton/news/x1540368852/Be-the-first-to-know-when-the-boil-water-order-is-over
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/newton/breaking/x1540368420/Water-pipe-fixed-Drinking-water-still-not-safe
5/4/2010	DCR Commissioner: Dam looks good	http://www.wickedlocal.com/newton/features/x826105312/DCR-Commissioner-Dam-looks-good
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/newton/news/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Newton sandwich shop shut down after child found playing in ice bin	http://www.wickedlocal.com/newton/news/x1540371536/Newton-sandwich-shop-shut-down-after-child-found-playing-in-ice-bin
5/4/2010	Newton mayor Warren's first four months plagued by water	http://www.wickedlocal.com/newton/features/x755768379/Newton-mayor-Warren-s-first-four-months-plagued-by-water
5/4/2010	Governor Patrick promises accountability after "boil water" order lifted	http://www.wickedlocal.com/newton/features/x1406503284/Governor-Patrick-promises-accountability-after-boil-water-order-lifted
5/4/2010	Tips for making sure your drinking water is safe	http://www.wickedlocal.com/newton/highlight/x1540370445/Tips-for-making-sure-your-drinking-water-is-safe

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5/4/2010	Boil water order lifted for 29 Boston area communities	http://www.wickedlocal.com/newton/breaking/x1540370429/Boil-water-order-lifted-for-29-Boston-area-communities
Norwood Transcript (Norwood, MA)		
5/1/2010	MWRA: Water main break is causing 8 million gallons of water an hour to spill into Charles River	http://www.wickedlocal.com/norwood/topstories/x826101717/MWRA-Water-main-break-is-causing-8-million-gallons-of-water-an-hour-to-spill-into-Charles-River
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/norwood/news/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	MWRA issues boil water order for Newton and other communities	http://www.wickedlocal.com/norwood/topstories/x1406499565/MWRA-issues-boil-order-water-for-Newton-and-other-communities
5/1/2010	Boil water order issued for Norwood	http://www.wickedlocal.com/norwood/breaking/x1042476473/Boil-water-order-issued-for-our-community
5/2/2010	PHOTOS and VIDEO: MWRA water main break in Weston	http://www.wickedlocal.com/norwood/news/x1406500325/PHOTOS-and-VIDEO-MWRA-water-main-break-in-Weston
5/2/2010	Norwood officials testing water supply; schools to serve cold lunches	http://www.wickedlocal.com/norwood/features/x1042477200/Norwood-officials-testing-water-supply-schools-to-serve-cold-lunches
5/2/2010	Are you stocked up on water?	http://www.wickedlocal.com/norwood/archive/x1540367952
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.wickedlocal.com/norwood/archive/x1130688200/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/3/2010	President Obama signs Massachusetts emergency disaster declaration	http://www.wickedlocal.com/norwood/topstories/x1042478879/President-Obama-signs-Massachusetts-emergency-disaster-declaration
5/3/2010	Food eateries, residents adapt to water woes	http://www.wickedlocal.com/norwood/features/x1540369613/Norwood-eateries-residents-adapt-to-water-woes
5/3/2010	Midpoints: Water main break reveals cracks in system	http://www.wickedlocal.com/norwood/news/lifestyle/columnists/x1540369678/Midpoints-Water-main-break-reveals-cracks-in-system
5/3/2010	Beware of price gouging	http://www.wickedlocal.com/norwood/news/x755765393/Beware-of-price-gouging

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5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/norwood/news/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil water order lifted for 29 Boston area communities	http://www.wickedlocal.com/norwood/topstories/x1540370429/Boil-water-order-lifted-for-29-Boston-area-communities
5/5/2010	Rep. John Rogers, D-Norwood, takes action after water crisis	http://www.wickedlocal.com/norwood/news/x289800824/Rep-John-Rogers-D-Norwood-takes-action-after-water-crisis
Patriot Ledger (Quincy, MA)		
5/1/2010	Water Emergency	http://www.patriotledger.com/homepage/special_report_water
5/1/2010	Water main break affects 31 Boston suburbs	http://www.patriotledger.com/homepage/special_report_water/x1540367467/Water-main-break-affects-31-Boston-suburbs
5/1/2010	Quincy, Milton scramble with water emergency response	http://www.patriotledger.com/homepage/breaking/x359583218/MWRA-orders-Quincy-Milton-residents-to-boil-water-due-to-pipe-break
5/1/2010	MWRA: ' Catastrophic failure' of water system leads to boil order (with video)	http://www.patriotledger.com/homepage/special_report_water/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	MWRA boil-water order includes Quincy, Milton, Canton, Stoughton	http://www.patriotledger.com/homepage/breaking/x359583210/MWRA-boil-water-order-includes-Quincy-Milton-Canton-Stoughton
5/1/2010	Tips from the state on boil-water orders	http://www.patriotledger.com/lifestyle/health_and_beauty/x755764211/Tips-from-the-state-on-boil-water-orders
5/2/2010	How did the water emergency affect you?	http://www.patriotledger.com/homepage/special_report_water/x755764436/How-is-the-water-emergency-affecting-you
5/2/2010	Local officials preparing for school week without water	http://www.patriotledger.com/news/x755764608/Tips-for-parents-of-school-children-in-water-boil-communities
5/2/2010	Patrick, local officials: Drinking water to be restored within days	http://www.patriotledger.com/lifestyle/health_and_beauty/x359583888/Drinking-water-restored-between-Tuesday-and-Thursday-Quincy-chief-says
5/2/2010	Water main break affects Boston, suburbs; Gov. Patrick declares state of emergency	http://www.patriotledger.com/swineflu/x826102326/Water-main-break-affects-Boston-suburbs-Gov-Patrick-declares-state-of-emergency

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5/2/2010	POLL: End to water emergency in sight	http://www.patriotledger.com/homepage/special_report_water/x1406500479/Quincy-begins-distributing-bottled-water-to-patient-residents
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.patriotledger.com/archive/x1406500245/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/3/2010	Boil-water order for Stoughton was a false alarm	http://www.patriotledger.com/topstories/x1195009804/Stoughton-stocks-up-on-bottled-water-in-face-of-boil-order-Boil-order-causes-run-on-stores
5/3/2010	VIDEOS: Testing key after water-main break	http://www.patriotledger.com/homepage/special_report_water/x1195010090/Quincy-will-distribute-more-free-bottled-water-to-residents-Monday
5/3/2010	United Way provides bottled water to homeless in Boston area	http://www.patriotledger.com/news/x1042479323/United-Way-provides-bottled-water-to-homeless-in-Boston-area
5/3/2010	Obama declares emergency to help state with water crisis recovery	http://www.patriotledger.com/news/x1195010136/Obama-declares-emergency-to-help-state-with-water-crisis-recovery
5/3/2010	Quincy water station to run out of bottles, won't restock	http://www.patriotledger.com/homepage/special_report_water/x1195010116/Quincy-water-station-to-run-out-of-bottles-won-t-restock
5/3/2010	Granlund cartoon: On the Boston-area water emergency	http://www.patriotledger.com/opinions/cartoons/x755765209/Granlund-cartoon-On-the-Boston-area-water-emergency
5/3/2010	Pipe fixed, clean water on the way to Boston area	http://www.patriotledger.com/homepage/breaking/x359583792/Boil-water-order-remains-in-effect-for-28-communities-in-eastern-Massachusetts
5/3/2010	Quincy, Milton, Canton schools open, taking precautions with water	http://www.patriotledger.com/news/education/x1195010086/Schools-taking-precautions
5/3/2010	Milton store says water prices were fair	http://www.patriotledger.com/homepage/special_report_water/x1195010152/Milton-store-says-water-prices-were-fair
5/3/2010	Fruit Center takes to Twitter to announce it has bottled water	http://www.patriotledger.com/archive/x1195010118/Fruit-Center-takes-to-Twitter-to-announce-it-has-bottled-water
5/3/2010	Milton, Quincy residents flock to Braintree for coffee fix	http://www.patriotledger.com/news/x1195010082/Milton-Quincy-residents-flock-to-Braintree-for-coffee-fix

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5/4/2010	Tips for making sure your drinking water is safe	http://www.patriotledger.com/lifestyle/health_and_beauty/x826105070/Tips-for-making-sure-you-water-is-safe
5/4/2010	Water or not, free coffee offered by Quincy Dunkin' Donuts	http://www.patriotledger.com/archive/x1195010154/Water-or-not-free-coffee-offered-by-Quincy-Dunkin-Donuts
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.patriotledger.com/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/5/2010	VIDEO: Watch the water main break as it happened	http://www.patriotledger.com/features/x289799207/VIDEO-Watch-the-water-main-break-as-it-happened
5/5/2010	Quincy flushes hydrants as precaution after lifting of boil-water order	http://www.patriotledger.com/news/x540644232/Quincy-flushes-hydrants-as-precaution-after-lifting-of-boil-water-order
5/6/2010	Water main break investigation turns to engineering records	http://www.patriotledger.com/topstories/x577130949/Water-main-break-investigation-turns-to-engineering-records
5/7/2010	Water authority to inspect pipes to head off future breaks	http://www.patriotledger.com/news/state_news/x577133512/Water-authority-to-inspect-pipes-to-head-off-future-breaks
5/8/2010	HEARD IN THE HALLS: Nobody in Quincy would have dared to throw their iced coffee during the water ban	http://www.patriotledger.com/opinions/x1773729726/HEARD-IN-THE-HALLS-Nobody-in-Quincy-would-have-dared-to-throw-their-iced-coffee-during-the-water-ban
5/13/2010	SPEAK OUT: Water main break raises questions	http://www.patriotledger.com/opinions/letters_to_the_editor/x1773731640/SPEAK-OUT-Water-main-break-raises-questions
Reading Advocate (Reading, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/reading/homepage/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/reading/homepage/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil water order lifted	http://www.wickedlocal.com/reading/breaking/x755767275/Boil-water-order-lifted
Revere Journal (Revere, MA)		
5/8/2010	A smooth-flowing operation	http://www.reverejournal.com/2010/05/08/a-smooth-flowing-operation/
5/8/2010	In a water emergency, top water official forgotten; Maglione says he was left out of the loop on purpose	http://www.reverejournal.com/2010/05/08/in-a-water-emergency-top-water-official-forgotten-maglione-says-he-was-left-out-of-the-loop-on-purpose/

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5/8/2010	Businesses cope with loss of water; frantic scene at BJ's	http://www.reverejournal.com/2010/05/08/businesses-cope-with-loss-of-water-frantic-scene-at-bjs/
5/8/2010	The Water Crisis – A potentially costly lesson for all of us	http://www.reverejournal.com/2010/05/08/the-water-crisis-a-potentially-costly-lesson-for-all-of-us/
5/12/2010	Public Safety First – Reverse 911 is worth the expenditure	http://www.reverejournal.com/2010/05/12/public-safety-first-reverse-911-is-worth-the-expenditure/
Saugus Advertiser (Saugus, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/saugus/features/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	MWRA issues boil water order for Saugus	http://www.wickedlocal.com/saugus/archive/x1406499643/MWRA-issues-boil-water-order-for-Saugus
5/1/2010	Boil order issued for Saugus drinking water supply	http://www.wickedlocal.com/saugus/breaking/x1406499640/Boil-order-issued-for-Saugus-drinking-water-supply
5/2/2010	Bottled water distribution Monday morning	http://www.wickedlocal.com/saugus/breaking/x826102556/Bottled-water-distribution-Monday-morning
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.wickedlocal.com/saugus/news/x1540367833/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/3/2010	MASS. WATER CRISIS: Drinking water likely to return in „next few days'	http://www.wickedlocal.com/saugus/features/x1406501286/MASS-WATER-CRISIS-Drinking-water-likely-to-return-in-next-few-days
5/3/2010	UPDATE WITH VIDEO: Saugus exhausts bottled water supply in less than two hours	http://www.wickedlocal.com/saugus/features/x1406501505/Saugus-exhausts-bottled-water-supply-in-less-than-two-hours
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/saugus/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil-water order lifted in Saugus	http://www.wickedlocal.com/saugus/breaking/x359586627/Boil-water-order-lifted-in-Saugus
5/4/2010	After the boil order: What to do to ensure water is safe to use	http://www.wickedlocal.com/saugus/fun/entertainment/music/x755767885/After-the-boil-order-What-to-do-to-ensure-water-is-safe-to-use

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5/5/2010	Looking back: MWRA pipe break causes headaches in Saugus	http://www.wickedlocal.com/saugus/features/x1920407275/Looking-back-MWRA-pipe-break-causes-headaches-in-Saugus
5/5/2010	PHOTO GALLERY: MWRA boil-water order in Saugus	http://www.wickedlocal.com/saugus/photos/x1381027968/PHOTO-GALLERY-MWRA-boil-water-order-in-Saugus
Somerville Journal (Somerville, MA)		
5/1/2010	Somerville responds to water boil order	http://www.wickedlocal.com/somerville/features/x1406499712/Somerville-responds-to-water-boil-order
5/1/2010	MWRA: Water main break is causing 8 million gallons of water an hour to spill into Charles River	http://www.wickedlocal.com/somerville/homepage/x826101717/MWRA-Water-main-break-is-causing-8-million-gallons-of-water-an-hour-to-spill-into-Charles-River
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/somerville/news/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	MWRA issues boil water order for Newton and other communities	http://www.wickedlocal.com/somerville/homepage/x1406499565/MWRA-issues-boil-order-water-for-Newton-and-other-communities
5/1/2010	Boil water order issued for Somerville	http://www.wickedlocal.com/somerville/breaking/x1042476479/Boil-water-order-issued-for-Somerville
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/somerville/news/x1042476936/Tips-from-the-state-on-boil-water-orders
5/1/2010	Residents strip shelves of bottled water following boil water order	http://www.wickedlocal.com/somerville/news/x1406499960/Newton-residents-strip-shelves-of-bottled-water-following-boil-water-order
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.wickedlocal.com/somerville/archive/x1130688200/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/2/2010	Safe drinking water ‚still days away' for communities under boil water order	http://www.wickedlocal.com/somerville/homepage/x1042477210/Safe-drinking-water-still-days-away-for-communities-under-boil-water-order
5/3/2010	President Obama signs Massachusetts emergency disaster declaration	http://www.wickedlocal.com/somerville/homepage/x1042478879/President-Obama-signs-Massachusetts-emergency-disaster-declaration

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5/3/2010	Somerville shops weather Aquapocalypse	http://www.wickedlocal.com/somerville/news/business/x755765434/Somerville-shops-weather-Aquapocalypse
5/3/2010	Beware of price gouging	http://www.wickedlocal.com/somerville/news/x755765395/Beware-of-price-gouging
5/3/2010	Somerville Hospital stocked up on clean water	http://www.wickedlocal.com/somerville/news/lifestyle/health/x1042478752/Somerville-Hospital-stocked-up-on-clean-water
5/3/2010	Somerville offers limited water distribution	http://www.wickedlocal.com/somerville/features/x1540369609/Somerville-offers-limited-water-distribution
5/3/2010	Somerville Public Schools bring in bottled and boiled water	http://www.wickedlocal.com/somerville/news/education/x1406501125/Somerville-Public-Schools-bring-in-bottled-and-boiled-water
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/somerville/homepage/x1540368420/Water-pipe-fixed-Drinking-water-still-not-safe
5/3/2010	Somerville responds to Aquapocalypse	http://www.wickedlocal.com/somerville/features/x1406501391/Somerville-responds-to-Aquapocalypse
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/somerville/breaking/x1406500962/Water-pipe-fixed-Drinking-water-still-not-safe
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/somerville/news/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	WCVB: No refund for customers after water crisis	http://www.wickedlocal.com/somerville/news/x1042481121/WCVB-No-refund-for-customers-after-water-crisis
5/4/2010	Governor Patrick promises accountability after “boil water” order lifted	http://www.wickedlocal.com/somerville/homepage/x1406503205/Governor-Patrick-promises-accountability-after-boil-water-order-lifted
5/4/2010	Tips for making sure your drinking water is safe	http://www.wickedlocal.com/somerville/features/x1406503001/Tips-for-making-sure-your-drinking-water-is-safe
5/4/2010	Boil water order lifted for 29 Boston area communities	http://www.wickedlocal.com/somerville/archive/x1540370429/Boil-water-order-lifted-for-29-Boston-area-communities
5/6/2010	Are you upset that the MWRA won’t be giving customers a break on their water bills after the water main break?	http://www.wickedlocal.com/somerville/archive/x1920410122

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Somerville News Blog (Somerville, MA)		
5/1/2010	Important Water Information	http://somervillenews.typepad.com/the_somerville_news/2010/05/important-water-information.html
5/3/2010	Somerville Public Schools will be in session tomorrow, May 3	http://somervillenews.typepad.com/the_somerville_news/2010/05/school-will-be-in-session-tomorrow-may-3-2010-in-somerville.html
5/3/2010	Despite water boil order, Lions charity breakfast a success	http://somervillenews.typepad.com/the_somerville_news/2010/05/page/6/
5/3/2010	Limited supply of bottled water now available	http://somervillenews.typepad.com/the_somerville_news/2010/05/limited-supply-of-bottled-water-now-available.html
5/3/2010	Somerville distributes thousands of bottled spring water to residents	http://somervillenews.typepad.com/the_somerville_news/2010/05/somerville-distributes-thousands-of-bottled-spring-water-to-residents.html
5/4/2010	Boil water order lifted	http://somervillenews.typepad.com/the_somerville_news/2010/05/boil-water-order-lifted.html
5/4/2010	Somerville Police Urge Residents to Beware of Imposters	http://somervillenews.typepad.com/the_somerville_news/2010/05/somerville-police-urge-residents-to-beware-of-imposters.html
5/5/2010	' Aquapocalypse' hits Somerville	http://somervillenews.typepad.com/the_somerville_news/2010/05/aquapocalypse-hits-somerville.html
5/5/2010	Cartoon of the week for May 5	http://somervillenews.typepad.com/the_somerville_news/2010/05/cartoon-of-the-week-for-may-5.html
5/8/2010	H2-OH NO	http://somervillenews.typepad.com/the_somerville_news/2010/05/h2-oh-no.html
5/19/2010	Somerville Aldermen push for post-Aquapocalypse billing credit	http://somervillenews.typepad.com/the_somerville_news/2010/05/somerville-aldermen-push-for-post-aquapocalypse-billing-credit.html
Stoneham Sun (Stoneham, MA)		
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/stoneham/features/x1042479787/Boil-water-order-lifted-for-Boston-area

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Swampscott Reporter (Swampscott, MA)		
5/2/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/swampscott/news/lifestyle/health/x1406500209/Tips-from-the-state-on-boil-water-orders
5/3/2010	MASS. WATER CRISIS: Drinking water likely to return in „next few days'	http://www.wickedlocal.com/swampscott/features/x755766298/MASS-WATER-CRISIS-Drinking-water-likely-to-return-in-next-few-days
5/3/2010	MASS. WATER CRISIS: Officials won't put date on return of drinkable water; repairs under way	http://www.wickedlocal.com/swampscott/news/lifestyle/health/x1042477795/MASS-WATER-CRISIS-Officials-wont-put-date-on-return-of-drinkable-water-repairs-under-way
5/5/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/swampscott/features/x1042479787/Boil-water-order-lifted-for-Boston-area
Thompson Reuters (New York, NY)		
5/1/2010	Burst pipe limits water supplies in Massachusetts	http://www.reuters.com/article/idUSN0113689120100502
5/2/2010	Boston area still on drinking water boil order	http://www.reuters.com/article/idUSTRE6420AI20100503
5/3/2010	Boston works through 3rd day without drinking water	http://www.reuters.com/article/idUSTRE6423KI20100503
5/4/2010	Boil-water ban lifted for Boston area	http://www.reuters.com/article/idUSN04260097
USA Today (McLean, VA)		
5/2/2010	Crews race to fix break in Boston's water supply	http://www.usatoday.com/news/nation/2010-05-02-boston-water-main_N.htm
5/4/2010	Boil water order is lifted for 2M in Boston area	http://www.usatoday.com/news/nation/2010-05-04-massachusetts-water_N.htm?loc = interstitialskip
5/5/2010	Turns out Boston-area water was OK to drink all along	http://content.usatoday.com/communities/ondeadline/post/2010/05/turns-out-boston-area-water-was-ok-to-drink-all-along/1
Wakefield Observer (Wakefield, MA)		
5/3/2010	Wakefield distributes bottled water for a second day	http://www.wickedlocal.com/wakefield/features/x755765674/Wakefield-distributes-bottled-water-for-a-second-day
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/wakefield/homepage/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Wakefield water works again	http://www.wickedlocal.com/wakefield/highlight/x755767641/Wakefield-water-works-again

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Waltham News Tribune (Waltham, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/waltham/topstories/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/waltham/news/x1042476938/Tips-from-the-state-on-boil-water-orders
5/2/2010	Boil water order in effect	http://www.wickedlocal.com/waltham/newsnow/x1195009868/Boil-water-order-in-effect
5/3/2010	Beware of price gouging	http://www.wickedlocal.com/waltham/newsnow/x1406501223/Beware-of-price-gouging
5/3/2010	Granlund cartoon: On the Boston-area water emergency	http://www.wickedlocal.com/waltham/news/opinions/x755765209/Granlund-cartoon-On-the-Boston-area-water-emergency
5/3/2010	Leak is almost plugged	http://www.wickedlocal.com/waltham/topstories/x1195010024/Leak-is-almost-plugged
5/3/2010	Waltham water distribution at Bright School	http://www.wickedlocal.com/waltham/features/x755765080/Waltham-water-distribution-at-Bright-School
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/waltham/newsnow/x826103054/Water-pipe-fixed-Drinking-water-still-not-safe
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/waltham/topstories/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	DCR Commissioner: Dam looks good	http://www.wickedlocal.com/waltham/features/x1195010264/DCR-Commissioner-Dam-looks-good
5/4/2010	Boil water order lifted for 29 Boston area communities	http://www.wickedlocal.com/waltham/topstories/x1130688646/Boil-water-order-lifted-for-29-Boston-area-communities
5/12/2010	Two Waltham stores accused of gouging	http://www.wickedlocal.com/waltham/topstories/x1773730985/Two-Waltham-stores-accused-of-gouging
5/18/2010	New emergency call system on the way for Waltham	http://www.wickedlocal.com/waltham/topstories/x150484088/New-emergency-call-system-on-the-way-for-Waltham

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Watertown Tab (Watertown, MA)		
5/1/2010	MWRA: Water main break is causing 8 million gallons of water an hour to spill into Charles River	http://www.wickedlocal.com/watertown/homepage/x826101717/MWRA-Water-main-break-is-causing-8-million-gallons-of-water-an-hour-to-spill-into-Charles-River
5/1/2010	Water main break affects 31 Greater Boston, suburbs	http://www.wickedlocal.com/watertown/news/x1540367301/Water-main-break-affects-31-Greater-Boston-suburbs
5/1/2010	Tips from the state on boil-water orders	http://www.wickedlocal.com/watertown/news/x1042476940/Tips-from-the-state-on-boil-water-orders
5/2/2010	Boil-water order remains in effect, but progress reported on water main break	http://www.wickedlocal.com/watertown/news/x826102590/Boil-water-order-remains-in-effect-but-progress-reported-on-water-main-break
5/2/2010	PHOTOS and VIDEO: MWRA water main break in Weston	http://www.wickedlocal.com/watertown/news/x1406500329/PHOTOS-and-VIDEO-MWRA-water-main-break-in-Weston
5/2/2010	Boil-water order remains in effect for 28 communities in eastern Massachusetts	http://www.wickedlocal.com/watertown/features/x359583811/Boil-water-order-remains-in-effect-for-28-communities-in-eastern-Massachusetts
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.wickedlocal.com/watertown/archive/x1130688200/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/2/2010	Safe drinking water „still days away' for communities under boil water order	http://www.wickedlocal.com/watertown/homepage/x1042477210/Safe-drinking-water-still-days-away-for-communities-under-boil-water-order
5/3/2010	President Obama signs Massachusetts emergency disaster declaration	http://www.wickedlocal.com/watertown/homepage/x1042478879/President-Obama-signs-Massachusetts-emergency-disaster-declaration
5/3/2010	Beware of price gouging	http://www.wickedlocal.com/watertown/news/x755765397/Beware-of-price-gouging
5/3/2010	Water pipe fixed; Drinking water still not safe	http://www.wickedlocal.com/watertown/homepage/x1540368420/Water-pipe-fixed-Drinking-water-still-not-safe
5/3/2010	Watertown stores and restaurants „surviving' Aquapocalypse	http://www.wickedlocal.com/watertown/features/x1406501810/Watertown-stores-and-restaurants-surviving-Aquapocalypse

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5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/watertown/features/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	Boil-water order lifted for Watertown and Boston area	http://www.wickedlocal.com/watertown/features/x826105080/Boil-water-order-lifted-for-Watertown-and-Boston-area
5/4/2010	Watertown customers will get no refund after water crisis	http://www.wickedlocal.com/watertown/news/x359587612/Watertown-customers-will-get-no-refund-after-water-crisis
5/4/2010	Governor Patrick promises accountability after "boil water" order lifted	http://www.wickedlocal.com/watertown/news/x1406503205/Governor-Patrick-promises-accountability-after-boil-water-order-lifted
5/4/2010	Details for post-boil ban actions on refrigerators, baby formula, etc.	http://www.wickedlocal.com/watertown/features/x826105108/Details-for-post-boil-ban-actions-on-refrigerators-baby-formula-etc
5/4/2010	Food establishments: Post-boil order instructions from state	http://www.wickedlocal.com/watertown/news/x359586418/Food-establishments-Post-boil-order-instructions-from-state
5/4/2010	Tips for making sure your drinking water is safe	http://www.wickedlocal.com/watertown/news/x1540370451/Tips-for-making-sure-your-drinking-water-is-safe
5/4/2010	Boil-water order lifted for Watertown and Boston area	http://www.wickedlocal.com/watertown/features/x826105080/Boil-water-order-lifted-for-Watertown-and-Boston-area
5/4/2010	Boil water order lifted for 29 Boston area communities	http://www.wickedlocal.com/watertown/homepage/x1540370429/Boil-water-order-lifted-for-29-Boston-area-communities
WBUR, National Public Radio (Boston, MA)		
5/1/2010	Crews Race To Fix Break In Boston's Water Supply	http://www.wbur.org/2010/05/01/water-main-break
5/2/2010	Mayor: Boston „Open For Business,' Despite Main Break	http://www.wbur.org/2010/05/02/water-break
5/2/2010	As Leak Persists, A Run On Bottled Water	http://www.wbur.org/2010/05/02/water-break-reactio
5/3/2010	Obama Declares Mass. Emergency For Water Break	http://www.wbur.org/2010/05/03/obama-disaster-declaration
5/3/2010	Special Monday Program: Boston Water Emergency	http://www.wbur.org/2010/05/03/boston-water-emergency
5/3/2010	Q&A: Keeping Healthy During Boston's Water Crisis	http://www.wbur.org/2010/05/03/health-explainer
5/3/2010	Water Ban Causes Frustration, Slows Business In Canton	http://www.wbur.org/2010/05/03/canton-reax
5/3/2010	Water Tests Underway After Piping Repairs	http://www.wbur.org/2010/05/03/water-pipe-repair
5/3/2010	Water Piping Repairs „Holding Great,' Says MWRA Director	http://www.wbur.org/2010/05/03/laskey-debrief
5/4/2010	Boil Water Order Is Lifted For 2M In Boston Area	http://www.wbur.org/2010/05/04/water-main-break-2

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5/4/2010	FAQ: How To Flush Water Lines And Appliances	http://www.wbur.org/2010/05/04/post-boil-orde
5/5/2010	Missing Collar Likely To Tell Story Of Pipe Break, Says Expert	http://www.wbur.org/2010/05/05/engineering
5/6/2010	MWRA Focuses Water Inquiry On Huge Pipe Collar	http://www.wbur.org/2010/05/06/water-folo
WBZ, Columbia Broadcasting System (Boston, MA)		
5/1/2010	2 Million Without Drinking Water In Boston	http://wbztv.com/national/water.emergency.boston.2.1669155.html
5/1/2010	What Is A Boil Water Order?	http://wbztv.com/local/boil.water.order.2.1668841.html
5/1/2010	Pets' Water Should Also Be Boiled	http://wbztv.com/local/pets.boil.water.2.1669025.html
5/2/2010	Dozens Of Communities Under Boil Water Order	http://wbztv.com/local/water.emergency.boston.2.1668790.html
5/2/2010	No Timetable For Water Service Restoration	http://wbztv.com/local/watermain.break.water.2.1669361.html
5/2/2010	Curious: What If I Drank The Water?	http://wbztv.com/curious/boil.water.order.2.1669370.html
5/2/2010	List Of Boil Water Order Communities	http://wbztv.com/local/boil.water.order.2.1669366.html
5/2/2010	Q&A On Water Use In Your Home	http://wbztv.com/local/water.emergency.questions.2.1669487.html
5/2/2010	MWRA Hopes Pipe Repair Will Be Done Sunday Night	http://wbztv.com/local/mwra.pipe.break.2.1669998.html
5/3/2010	Students Bring Water To School	http://wbztv.com/local/students.schools.water.2.1672162.html
5/3/2010	Price Gouging Number Set Up During Water Emergency	http://wbztv.com/local/price.gouging.water.2.1671094.html
5/3/2010	State Vows To Investigate Water Main Break	http://wbztv.com/local/investigation.water.main.2.1672224.html
5/3/2010	Water Distribution Locations For Towns Under Ban	http://wbztv.com/local/boil.water.order.2.1670813.html
5/3/2010	Schools Open Despite Water Emergency	http://wbztv.com/local/schools.open.water.2.1669891.html
5/4/2010	Weston Pipe Repairs Complete; Water Tests Begin	http://wbztv.com/local/mwra.pipe.break.2.1670619.html
5/4/2010	How Do I Get Clean Water Running In My House?	http://wbztv.com/local/water.flushing.faucets.2.1673401.html
5/4/2010	Boil Water Order Lifted For All 30 Communities	http://wbztv.com/local/boil.water.order.2.1673284.html
5/4/2010	Patrick Promises Full Water Main Break Probe	http://wbztv.com/local/water.main.break.2.1673298.html
5/4/2010	Curious About Water Bill Discounts After Emergency	http://wbztv.com/curious/water.bills.mwra.2.1673361.html
5/5/2010	Backup Water System Was Not Contaminated	http://wbztv.com/local/water.main.break.2.1676398.html
5/6/2010	MWRA Officials To Inspect 8 Water Pipe Couplings	http://wbztv.com/local/boston.water.main.2.1679410.html
5/26/2010	Weston Water Main Break Bill: $600,000 So Far	http://wbztv.com/local/water.main.break.2.1715611.html

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WCVB, American Broadcasting Company (Boston, MA)		
5/1/2010	MWRA Water Main Break Triggers State Of Emergency	http://www.thebostonchannel.com/news/23337764/detail.html
5/1/2010	Safe Drinking Water 'Still Days Away'	http://www.thebostonchannel.com/news/23338076/detail.html
5/1/2010	Water Safety Tips	http://www.thebostonchannel.com/news/23353544/detail.html
5/2/2010	Water Emergency Enters Day 3	http://www.thebostonchannel.com/news/23419933/detail.html
5/2/2010	Schools Take Safety Precautions With Water Leak	http://www.thebostonchannel.com/news/23418732/detail.html
5/3/2010	Water Crisis: How To Stay Safe	http://www.thebostonchannel.com/news/23407911/detail.html
5/4/2010	Lifting Of Boil Order Brings Relief	http://www.thebostonchannel.com/news/23441399/detail.html
5/5/2010	Piece Of Broken Water Pipe Eludes Searchers	http://www.thebostonchannel.com/news/23457809/detail.html
Weekly News (Lynnfield, MA)		
5/2/2010	BREAKING NEWS: Boil order for Lynnfield Water District, Peabody water safe	http://weeklynews.net/drupal/node/622
5/3/2010	BREAKING NEWS: Town hands out bottled water at fire station	http://weeklynews.net/drupal/node/624
5/3/2010	Boil order for residents in South Lynnfield	http://weeklynews.net/drupal/node/626
5/4/2010	BREAKING NEWS: State officials lift boil order	http://weeklynews.net/drupal/node/627
WHDH, National Broadcasting Company (Boston, MA)		
5/1/2010	MWRA water main break forces boil water order	http://www1.whdh.com/news/articles/local/BO141256/
5/1/2010	Stores sell out of bottled water	http://www1.whdh.com/news/articles/local/MI139127/
5/1/2010	What is a 'boil-water' order?	http://www1.whdh.com/news/articles/local/BO141261/
5/1/2010	2 million residents under boil water order	http://www1.whdh.com/news/articles/local/MI139115/
5/1/2010	MWRA water break press release	http://www1.whdh.com/news/articles/local/BO141259/
5/2/2010	Businesses, colleges respond to 'boil-water' order	http://www1.whdh.com/news/articles/local/BO141286/
5/2/2010	Map of the MWRA water system	http://www1.whdh.com/news/articles/local/BO141281/
5/2/2010	Press Release: School open Monday in Boston	http://www1.whdh.com/news/articles/local/BO141287/
5/2/2010	Boil order forces restaurants to close, make changes	http://www1.whdh.com/news/articles/local/BO141298/
5/2/2010	Saugus to distribute bottled water on Monday	http://www1.whdh.com/news/articles/local/BO141283/
5/3/2010	Pipe fixed, 'Boil-water' order still in effect	http://www1.whdh.com/news/articles/local/BO141267/
5/3/2010	Eye care, contact lens tips during water emergency	http://www1.whdh.com/news/articles/local/BO141337/
5/3/2010	Area schools open Monday despite 'boil-water' order	http://www1.whdh.com/news/articles/local/BO141294/

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5/3/2010	MassDEP: 'Boil-water' order FAQ	http://www1.whdh.com/news/articles/local/BO141273/
5/3/2010	Health officials cite tap water risks, offer safety tips	http://www1.whdh.com/news/articles/local/BO141295/
5/3/2010	How to report water price gouging	http://www1.whdh.com/news/articles/local/BO141296/
5/3/2010	Pipe was supposed to last 50 years: What went wrong?	http://www1.whdh.com/news/articles/local/BO141341/
5/3/2010	List of towns distributing water	http://www1.whdh.com/news/articles/local/BO141274/
5/4/2010	Business up for Cambridge restaurant owners	http://www1.whdh.com/news/articles/local/BO141369/
5/4/2010	7NEWS Raw Video: Water main break	http://www1.whdh.com/news/articles/local/BO141306/
5/4/2010	Water emergency ends, investigation continues	http://www1.whdh.com/news/articles/local/BO141406/
5/4/2010	Boil water order lifted for all 30 towns in Boston area	http://www1.whdh.com/news/articles/local/BO141372/
5/4/2010	Town-by-town alerts on lifted 'boil-water' order	http://www1.whdh.com/news/articles/local/MI139125/
Winchester Star (Winchester, MA)		
5/1/2010	MWRA: 'Catastrophic failure' of water system leads to boil order (with video)	http://www.wickedlocal.com/winchester/newsnow/x1406499537/MWRA-Stop-using-water-this-afternoon-in-Weston-and-points-east
5/2/2010	Patrick: We are looking at days, not weeks before water is safe to drink	http://www.wickedlocal.com/winchester/news/x1042477187/Patrick-We-are-looking-at-days-not-weeks-before-water-is-safe-to-drink
5/2/2010	Water advisory only affects some sections of Winchester	http://www.wickedlocal.com/winchester/breaking/x1042477479/Water-advisory-only-affects-some-sections-of-Winchester
5/3/2010	Company 'will cooperate fully' to find out why water pipe failed	http://www.wickedlocal.com/winchester/breaking/x1406501849/Company-will-cooperate-fully-to-find-out-why-water-pipe-failed
5/3/2010	LETTER: Town of Winchester needs to act faster on the information front when an emergency erupts	http://www.wickedlocal.com/winchester/town_info/government/x1406501158/LETTER-Town-of-Winchester-needs-to-act-faster-on-the-information-front-when-an-emergency-erupts
5/4/2010	POLL: Boil-water order lifted for Boston and suburbs	http://www.wickedlocal.com/winchester/newsnow/x1042479787/Boil-water-order-lifted-for-Boston-area
5/4/2010	National Guard joined MEMA in distributing water to 30 communities in the greater Boston area	http://www.wickedlocal.com/winchester/town_info/government/x826105970/National-Guard-joined-MEMA-in-distributing-water-to-30-communities-in-the-greater-Boston-area

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5/4/2010	State vows to probe cause of MWRA water main break	http://www.wickedlocal.com/winchester/breaking/x755767169/State-vows-to-probe-cause-of-MWRA-water-main-break
5/4/2010	WATER CRISIS: Winchester Town Manager apologizes for reverse-911 failure	http://www.wickedlocal.com/winchester/breaking/x826105603/WATER-CRISIS-Winchester-Town-Manager-apologizes-for-reverse-911-failure
5/4/2010	Governor lifts boil water order	http://www.wickedlocal.com/winchester/breaking/x755767172/Governor-lifts-boil-water-order
5/5/2010	WATER CRISIS: Verizon customers get Winchester emergency alert; most others left to fend for themselves	http://www.wickedlocal.com/winchester/breaking/x2084226982/WATER-CRISIS-Verizon-customers-get-Winchester-emergency-alert-most-others-left-to-fend-for-themselves
5/7/2010	LETTER: Winchester Town Manager sorry for reverse 911 failure	http://www.wickedlocal.com/winchester/features/x289804932/LETTER-Winchester-Town-Manager-sorry-for-reverse-911-failure
5/8/2010	MWRA set to vote on panel to investigate pipe breach	http://www.wickedlocal.com/winchester/town_info/government/x289806724/MWRA-set-to-vote-on-panel-to-investigate-pipe-breach
Winthrop Transcript (Winthrop, MA)		
5/8/2010	Town's response was refreshing	http://www.winthroptranscript.com/2010/05/08/towns-response-was-refreshing/
5/8/2010	A Good Response – Chief Flanagan, others deserve credit	http://www.winthroptranscript.com/2010/05/08/a-good-response-chief-flanagan-others-deserve-credit/
Your Arlington (Arlington, MA)		
5/1/2010	Timeline details how news of 'catastrophic' water-main break came to Arlington	http://www.yourarlington.com/town-news/2919-water-main-break-may110
5/5/2010	2 of 4 contaminated water samples found in Arlington, Globe reports	http://www.yourarlington.com/town-news/2927-water-main-break-may510

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