Public Water System
Emergency Operations Plan
Guidance Document

Tennessee Department of Environment and Conservation

Division of Water Supply

October, 2007

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Section 1. INTRODUCTION

A. Protecting the Public Health

The mission of every public water system is to provide safe and reliable drinking water to the community. The water supply must be of consistently high quality for drinking purposes and in compliance with federal and state water quality standards. The water must be delivered in adequate quantity and at adequate pressure to serve all domestic, commercial and fire protection needs (where required) of the service area.

An Emergency Operations Plan* (EOP) identifies natural disasters and other emergencies that may strike the water system. The EOP takes into account the risk associated with various emergencies, identifies available resources, and provides a tool for decision makers to use in mitigating the impacts of an emergency. The EOP assists the water system in responding quickly and effectively to an emergency. A carefully planned EOP will reduce property damage, minimize downtime, prevent illness, save lives, and reduce system liability. Emergency response planning is an essential part of managing a public water system.

An EOP includes specific response actions to routine operating emergencies (line break, power outage, mechanical failure, water contamination), natural disasters (tornado, flood, earthquake, ice storm, drought), accidents (fire, chemical spill, explosion), intentional man-made acts (vandalism, terrorism, threats), or any major catastrophic incident that causes casualties, damage or disruption to the water system. For water systems that have performed a vulnerability assessment (VA), the EOP should include response actions to potential threats and malevolent acts identified in the water system's VA. These threats/acts could include sabotage/contamination, physical destruction, computer or System Control and Data Acquisition (SCADA) attacks and hazardous chemical releases.

Tennessee water systems understand the vital role they play in the health and well being of their community and customers. Each water system constitutes a critical piece of the local infrastructure and economy. The water system will create an EOP that will defend against acts that could potentially disrupt or endanger the water supply.

* The Tennessee Division of Water Supply (DWS) defines a document that prepares for an emergency response as an "Emergency Operations Plan". The U.S. Environmental Protection Agency (EPA) refers to this document as an "Emergency Response Plan (ERP)".

B. Requirements for an Emergency Operations Plan

The Tennessee Division of Water Supply (DWS) requires each community water system to have an Emergency Operations Plan:

> Rules of Tennessee Department of Environment and Conservation, Bureau of Environment, Division of Water Supply, Chapter 1200-5-1-.17 (7), "… all community water systems shall prepare an emergency operations plan in order

to safeguard the water supply and to alert the public of unsafe drinking water in the event of natural or man-made disasters."

After the attack of September 11, 2001, the federal government amended the Safe Drinking Water Act (SDWA) to add regulations on emergency preparedness for utilities, including community water systems. The BioTerrorism Act of 2002 added amendments to the Safe Drinking Water Act that required the revision of water system emergency response plans to incorporate the results of the water system's vulnerability assessment. The Terrorism Act required that emergency response plans include plans, procedures, and the identification of equipment that can be used in the event of a terrorist or other intentional attack on the water system.

C. State FOIA Law for Water System Information

The Terrorism Prevention and Response Act of 2002 amended Tennessee Code Annotated to exempt certain utility records from the Freedom of Information Act (FOIA). Tennessee Code Annotated, Section 10-7-504(a), allows Vulnerability Assessments and certain other water security information to be kept confidential:

> (21) (A) The following records shall be treated as confidential and shall not be open for public inspection:
>
> (i) Records that would allow a person to identify areas of structural or operational vulnerability of a utility service provider or that would permit unlawful disruption to, or interference with, the services provided by a utility service provider;
>
> (ii) All contingency plans of a governmental entity prepared to respond to or prevent any violent incident, bomb threat, ongoing act of violence at a school or business, ongoing act of violence at a place of public gathering, threat involving a weapon of mass destruction, or terrorist incident.

The water system should decide which sections of the EOP contain sensitive information (records or contingency plans as defined in Section 10-7-504(a)). These sections of the EOP should be stored under lock in a secure place. Sensitive maps and/or confidential sections should be distributed on a "need-to-know" basis in an emergency. The EOP and all referenced sections must be readily accessible in an emergency. Implement a procedure that enables, at minimum, the Emergency Response Coordinator (ERC) and two alternates, to access any secured EOP documents.

D. How to Use this Guide

The purpose of this guide is to present the requirements for preparing and/or updating an Emergency Operations Plan and to assist water systems in meeting those

requirements. The EOP is a "living" document and should be reviewed and **updated every two years**, when there is a change to the water system configuration, or when required by state or federal regulations.

This EOP guidance document is written in general terms for all water systems. It should be modified to fit the specific emergency planning needs of each water system. Section II begins with an Overview that summarizes the process of emergency management planning. Section II outlines the eight basic elements of emergency response planning and in addition, includes templates completed for a fictional "Middletown Water System". These examples are for illustration only. Any similarities in the names used in "Middletown Water System" examples to people in real life are coincidental. Appendix A contains 35 templates that may be used for completing or updating your EOP. Other emergency response planning methods or formats are acceptable for the creation of an EOP. It is not a requirement to use the templates provided in this guidance document as long as the EOP contains the DWS requirements and is submitted in a format approved by DWS. **(See Appendix C for Outline of EOP Requirements.)**

Copies of this Emergency Operations Planning Guide are available from the Tennessee Department of Environment and Conservation Field Offices (EFO) or the Nashville Central Office (NCO). Mail requests to the Division of Water Supply, TDEC, 6th Floor, L&C Tower, 401 Church Street, Nashville, TN 37243-1549. The guidance documents may be downloaded from the Division of Water Supply web site at: http://www.tn.gov/environment/dws/security/svadocuments.shtml

E-mail requests should be sent to water.supply@tn.gov
Telephone requests may be made at 615-532-0191.

The water system's EOP will be composed of many separate sections (Emergency Action Plans, Emergency Contact Information, Chemical Inventory Sheets, Appendices, etc.) and reference other existing documents (system maps, Standard Operating Procedures, Chlorine Risk Management Plan, etc.). A detailed "Table of Contents" at the beginning of the EOP is crucial to locating information within the document and locating maps, valve books, etc. The EOP and all referenced documents should be stored in readily accessible locations at the water plant, main office and other critical buildings. At minimum, one copy of the EOP and other critical documents should be stored at a secure off-site location.

Before updating your EOP, review any EOP comments or suggestions made by the Tennessee Division of Water Supply EFO staff during the last Sanitary Survey. Any deficiencies should be corrected.

The Environmental Protection Agency (EPA), American Water Works Association (AWWA), Tennessee Association of Utility Districts (TAUD), National Rural Water Association (NRWA), and other associations/groups have produced valuable publications concerning the preparation of an Emergency Operations Plan. The Occupational Safety and Health Administration (OSHA), National Safety Council (NSC) and Department of Homeland Security (DHS) have valuable emergency response planning information available on their web sites. You should review several of these resources before revising or writing your EOP. (See References and Links, pp. 42-44.)

Section II. EMERGENCY PLANNING PROCESS

A. Overview of an Emergency Management Planning Process

1. Introduction – Emergencies, Threats and Risks

The purpose of an Emergency Operations Plan (EOP) is to recognize and quantify potential natural disasters and emergencies caused by man. An EOP takes into account the risk potentials of the various emergencies, identifies available and needed resources and provides a tool or guide for decision makers or the Emergency Response Coordinator (ERC) to use in mitigating the impacts of actual emergencies. An EOP is essentially a good risk management investment. Higher risk hazards require mitigation measures to reduce risk. Water system managers will want to go beyond the statutory mandate and DWS requirements when preparing their EOP.

2. Acknowledge Existing Partnerships, Policies, Plans & Procedures

The water system should take an inventory of existing Operating Procedures, Emergency Response Plans, Chemical Risk Management Plans, Mutual Aid Agreements, etc. Outdated plans should be reviewed and updated before they are incorporated into the Emergency Operations Plan.

3. Mission, Goals and Objectives – Risk Management

States, cities, agencies of municipal government, and private sector organizations, including utility and other service providers must work together in a coordinated fashion in response to some disasters or emergencies having a combination of impacts or multiple impacts. In other situations, the response to a single-point or isolated impact emergency may fall to a single agency responding to a limited, identifiable system impact (i.e., the loss of a critical component or asset). An EOP, if it is a municipal plan must address coordination issues and establish priorities where resources are limited among competing needs. Single agency providers of services must do their part in emergencies having multiple impacts. Consequently the EOP of a single-agency is two-prong: it must be sensitive and responsive to emergencies that are wider in scope than the function they specifically address and they must develop capacity to address single system or component impacts. The EOP of a single agency may have its own mission within the context of a larger regional mission. It is vital to acknowledge the overall goals and objectives the EOP while at the same time understand that goals and objectives may change in response to the impacts and risks inherent in a particular emergency.

A good emergency operations plan should identify priorities relative to protecting certain communities or groups (e.g., critical users of water, hospitals, nursing homes, commercial and industrial customers that incorporate water into their product) as well as identify any groups that might be more severely impacted as a result of the emergency (e.g. senior residential housing, child care centers, medical facilities). The purpose of the EOP is to have given some forethought to possible threats and the responses to emergencies.

4. Monitoring, Detection and Trigger-points

Drought and floods can be monitored using rainfall, temperature and soil data. Weather forecasts are useful in monitoring for the potential of tornados, winds and ice storms. The availability of drinking water can be assessed by monitoring storage tank levels and water treatment plant production. Electrical demand and production can also be monitored. Less predictable are those threats that cannot be monitored such as bomb threats, fires, tornados and crashes. Nevertheless, emergency events occur and are reported or situations are detected. Perhaps it is the result of physician visits or hospitalizations, positive microbiological samples, a police incident report, media event or other report.

The EOP should identify the various monitoring and detection schemes that come into play when conditions or certain circumstances exist. It is important to recognize that systems exist that may aid in recognizing a threat or the level of the threat. Once a threat or emergency has been identified, it can be vital to also identify the "trigger-points," or points at which certain prescribed actions are taken. The value of "trigger-points" is that these are rationally identified during times when fear and other emotions are not necessarily overriding. Trigger-points are identified based on calculated and known factors, not ignorance. They may be based on the loss of critical resources, such as communication facilities or power distribution facilities. Knowing when something requires resources beyond what is typically handled, or when additional resources are required to manage a situation, is a powerful management tool.

5. Management Team – Purpose, Structure, Roles and Functions

A major emergency event may impact several local agencies and in the larger context of the event each must be subordinate to a higher-level authority in its decision-making role, even though parallel actions are required of several local entities, state and even federal agencies. A water system may not be the appropriate agency to take charge. Because cities, agencies of municipal government, and private sector organizations must work together in a highly coordinated fashion in response to some emergencies having multiple impacts, it is essential that the EOP define the roles of each agency in an emergency situation and identifies who is likely to assume authority in various scenarios.

Who is in-charge at a particular time and under what circumstances? Who provides direction to agencies? What roles do the various agency leaders have? Who reports to whom when the emergency is regional in scope? What problems are likely to occur where federal, state, and Local Emergency Planning Committees (LEPC) or Emergency Management Agencies (EMA) overlap? Emergency Response Coordinators and/or Incident Commanders must have a clear understanding of their roles and responsibilities. This section of the EOP should address the need for an overarching framework for decision-making and management and integrate the planning of the LEPC or EMA into its plan. Water systems should form partnerships with local and State entities so that each party knows and understands its roll and responsibilities in emergency situations. A unified command must be put in place to ensure emergency response actions are safe (no one gets hurt), effective (everyone works towards stated objectives) and efficient (all resources are utilized to maximum benefit).

An Incident Command System (ICS) is a standardized incident management concept designed specifically to allow responders to adopt an integrated organizational structure without being hindered by jurisdictional boundaries. ICS was originally developed to manage wild fires in the early 1970's. Today, ICS is an integral part of the National Incident Management System (NIMS) that was established in 2004 by the Department of Homeland Security pursuant to Homeland Security Presidential Directive-5. The following definition of ICS is from NIMS:

> "The ICS is a management system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to enable effective and efficient domestic incident management. A basic premise of ICS is that it is widely applicable. It is used to organize both near-term and long-term field-level operations for a broad spectrum of emergencies, from small to complex incidents, both natural and manmade. ICS is used by all levels of government—Federal, State, local, and tribal—as well as by many private-sector and nongovernmental organizations. ICS is also applicable across disciplines. It is normally structured to facilitate activities in five major functional areas: command, operations, planning, logistics, and finance and administration."

An ICS may be implemented by local emergency responders and/or state TEMA officials if the incident requires an inter-agency command structure to better coordinate the response.

6. Initial Management of a Situation – Formulate of a Plan

Identify the many possible kinds of threats or emergencies a city and/or water department might face. Each type of threat can be characterized in terms of potential impacts, hazards, ramifications and general measures required to address the situation. All hazards or emergencies will indicate the need to collect certain types of samples, take specific safety precautions, undertake site investigations and surveys, mobilize certain kinds of equipment and trained personnel, or implement a communications plan.

a. The Initial Evaluation of the Situation. The initial evaluation of the situation should key off of the initial management phase. Types of Threats (Characterization) that should be considered:

- Man-Induced (Siege - Hostage Takeover, Bomb Explosion, Cross-Connections, Coordinated Chemical, Biological, Radiological (CBR) Attack
- Informational (Bomb Threat, CBR Letter Threat, Bogus Data Transmission, Siege – Hostage Takeover)
- Natural Disaster (Fire, Tornado, Ice, Flood, Wind, Earthquake, Drought, Meteoroid)
- Accidental (Line break, Chemical Spill, Structural Collapse, Explosion, Airline/Bus/Train Crash, Communications Loss)

Each type of threat or emergency sets the stage for a further assessment of the situation and the response to it.

b. Assessment of Resources, Needs, Magnitude. The assessment of resources, needs and magnitude of the emergency or threat is another step in the initial management of a situation. The decision-makers or ERC must not only characterize the type of threat or emergency, but determine its magnitude, as well as make an assessment of needs and the resources to mitigate those needs. This assessment should quickly lead to a determination of who is or ought to be in command and the various responders required and the roles they must assume. At the water system level, the ERC has the role of "Incident Commander," unless the emergency event is of such significance or magnitude that local, State, or Federal officials should be in charge. The management of an emergency event should reflect the capabilities and scope of the event. This best occurs when the incident commander is based on pre-existing emergency operations plans and specific incident priorities. Responding to an emergency without first making some assessment of the situation and its overall magnitude can result in resources being misused while more critical needs go unaddressed. During this phase of response, the decision-maker needs information obtained from observers, established monitoring resources, and information from resource lists, such as personal and equipment lists. In addition, the decision-maker must assess their communication needs, not only for additional equipment and information but also in providing information to staff and the affected public. Personnel with critical skills and training, and specific equipment must also be assessed during this phase.

c. Identification of Potential Response Actions and Evaluation to Meet Objectives. The decision makers or ERC should identify as specifically as possible the potential responses or actions available and evaluate the specific impacts and benefits that might be derived from each set of actions. A good exercise is to list the potential actions along with all potential positive and negative consequences of each action. It is critical to identify the resources required to implement each action.

d. Adopting an Action Plan. With the pre-plan goals and objectives identified in the EOP the decision makers or ERC should select or adopt the actions that should be taken that would best satisfy the community's priorities.

e. Assignment of Action Plan. It is vital that every action or response selected by decision-makers or ERC be communicated to those who must implement the Action Plan. Contacts list, organizational chart, communication plan and other resources in the Appendices should be up-to date and used. It is important that those responsible for implementing the plan understand the overall priorities and objectives to be achieved, especially when the situation is confusing or unclear.

7. Refinement of Management

After agencies have made immediate responses to an emergency, it may be necessary to alter the management of a situation because management measures fail to respond or recover as anticipated or the situation has changed. After an initial response, with short-term recovery, it is often necessary to begin directing resources that will aid in the long-term recovery.

8. Potential Immediate Action Plans

Examples of four potential action plans (Power Outage, Potential Contamination of Water System, Major Line Break, Bomb Threat) are provided in Section II-G. The

water system may refer to these action plans when writing the action plans specific to their water system.

9. Potential Long-Term Remedial Action Plans

The potential long-term response measures for basic scenarios should be considered. To some Action Plans there would be response measures and public announcements/advisories that might be useful over a long-term period.

10. Long-Term Measures and Their Refinement

Periodically long-term measures and their effectiveness should be evaluated and mid-course adjustments made. Shifting of resources, staff, and perhaps even priorities may be in order to reflect changing public perceptions and needs. The importance of maintaining the public's confidence in the community water supply should always be considered.

11. Training Exercises

This section should list needed training workshops, establish a basic time-table for instruction and schedule emergency response exercises. A plan is more useful in an emergency if the responders are familiar with the actions outlined in the EOP. Table-top exercises or drills help the water system test the EOP and revise it where necessary. Participants develop confidence in their ability to respond to any emergency by "acting out" a response under controlled conditions.

12. EOP Approval, Review and Up-date Schedule

The EOP should be prepared and have the involvement of everyone expected to use it. Objections and unresolved issues should be resolved before the EOP is approved and adopted by the various authorities involved. Copies of the document must be available to water system personnel and first responders required to implement it and to those responsible for decision-making. Hard copies must be available in addition to electronic copies. One copy should be stored offsite in a safe, secure location. The EOP should include a schedule for reviewing and updating.

B. Preliminary Steps

1. Planning Partnerships

The water system should include the following in the emergency planning process: first responders (local law enforcement, fire department, Emergency Management Agency (EMA), and Local Emergency Planning Committee (LEPC); public health officials; nearby utilities; associations; testing laboratories; and units of local, state and federal government. In addition, the water system may include any person or agency that can assist in an emergency situation.

If the system serves a small community, an ad hoc committee can provide all the input needed to create the EOP. If the system serves a large urban population, a formalized board may be required to present proposals to groups and/or major water users. An advisory group insures an appropriate and effective community response in both the planning process and in an actual emergency. Complete a list of EOP planning partners similar to Figure 1.

Figure 1. Emergency Operations Planning Partners (Template A-1).

Emergency Operations Planning Partners		
Water Dept. Manager		
Name: Middletown Water District		
Contact: John Johnson	**Title:**	Manager Water Plant
Director of Utilities		
Name: Middletown Utilities		
Contact: Ben Brown	**Title:**	Director of Middletown Utilities
Mayor		
Name: Town of Middletown		
Contact: Fred Jones	**Title:**	Mayor
Local Police Department		
Name: Middletown Police Department		
Contact: John Brown	**Title:**	Police Chief
Local Fire Department		
Name: Middletown Fire Department		
Contact: Tom Miller	**Title:**	Captain
County Law Office/Sheriff		
Name: Anderson County Sheriff's Office		
Contact: Jim Smith	**Title:**	Sheriff
Local Hospital		
Name: North Tennessee Regional Medical Center		
Contact: Dr. Robert Jones	**Title:**	Director of Hospital
LEPC/Civil Defense Office		
Name: Anderson County Civil Defense		
Contact: Bobby Anderson	**Title:**	Manager
Emergency Management Agency		
Name: Anderson County Emergency Management Agency		
Contact: Glenn Smith	**Title:**	Director
Nearby Utilities		
Name: Friendsville Water Utility District		
Contact: Fred Partner	**Title:**	Friendsville Water Plant Mgr.

2. Existing Policies, Plans, Procedures

Before revising the water system's EOP, describe all emergency response protocols currently in place. List chlorine and/or ammonia Risk Management Plans (RMPs), Material Safety Data Sheets (MSDS), Spill Prevention Control and Countermeasures (SPCC), Personal Protective Equipment (PPE), Occupational Safety and Health Administration (OSHA) plans, alarm systems, emergency exit plans, and mutual aid agreements with neighboring water systems. Any outdated plans or procedures should be updated before they are included in the EOP. The location, responsible party, and date of activation of these documents should be listed in the EOP and they may be incorporated into Emergency Response Action Plans as necessary.

Figure 2. Emergency Policies, Plans, Procedures (Template A-2).

Emergency Policies, Plans, and Procedures			
Summary of Emergency Response Procedures	Middletown Water System has an Emergency Operations Plan (EOP). A Vulnerability Assessment has been completed and the EOP has been revised to comply with the Terrorism Act of 2002. Standard Operating Procedures are available for all plant operations and maintenance. A Risk Management Plan (Chlorine) is in place and in compliance with EPA regulations. Material Safety Data Sheets (MSDS) are on hand for all hazardous chemicals. Middletown Water System has a Mutual Aid and Assistance Agreement with Friendly U.D. to provide 500,000 GPD in an emergency. Anderson County EMA is the lead agency in the event of a major natural disaster, terrorist attack, or other severe emergency.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Vulnerability Assessment	Water Plant Office	John Johnson	04/20/2003
Description:	The NRWA SEMS computer software was used to complete a Vulnerability Assessment (VA). The VA document and a "Cert. Of Completion of a VA" was submitted to the EPA on 04/20/2003.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Emergency Operations Plan	Water Plant Office	John Johnson	10/20/2003
Description:	EOP has been revised as required by the Terrorism Act of 2002 and mandated by EPA. It incorporates results of Vulnerability Assessment and addresses threats of Acts of Terrorism. A "Certification of Completion of an ERP" was submitted to the EPA on 10/20/2003. The EOP is reviewed annually.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
County Emergency Response Plan	Mayor's Office	John Johnson	02/30/2004
Description:	Anderson County LEPC has completed an Emergency Response Plan in coordination with Middletown Fire Dept, Police Dept., Water Dept., Hospital, City Council, and EMA. This ERP is for a disaster requiring TEMA and a multi-level response with an Incident Command System (ICS).		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Risk Management Plan	Water Plant Office	Bill Jones	09/25/1999
Description:	Chlorine RMP submitted to EPA.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
MSDS Chemical Sheets	Water Plant Office	Bill Jones	01/11/2004
Description:	All Chemical MSDS sheets are available for chemicals currently in use.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
OSHA Lockout/Tagout Plan	Water Plant Office	Bill Jones	01/11/2004
Description:	Lockout/tagout procedures for working in pump vaults.		

Figure 2. Emergency Policies, Plans, Procedures (Continued)

Policy/Plan	Location	Responsible Party	Date
Wellhead Protection Plan	Water Plant Office	John Johnson	10/20/2002
Description:	Completed final plan in fall 2002 with assistance from Division of Water Supply Ground Water Management and TAUD personnel.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Source Water Assessment Program	Water Plant Office	John Johnson	3/25/2003
Description:	Filed with TN DWS in Spring 2003.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Distribution System Flushing Plan	Water Plant Office	John Johnson	8/22/2005
Description:	Annual schedule to flush all water lines in distribution system.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Cross Connection Plan	Water Plant Office	John Johnson	3/20/2003
Description:	Filed with TN DWS in Spring 2003.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Fire Hydrant Color-Coded Policy	Water Plant Office	John Johnson	8/1/2004
Description:	Plan details color-coded hydrants to indicate flow rate. Policy also includes prioritized schedule for replacing old hydrants in distribution system.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Water Plant Alarm System	Water Plant	Bill Jones	3/25/2004
Description:	Fire alarm and ABC Security System installed by Security Plus Inc. Complete system components are sensitive information. All security breaks are reported to ABC call center, Middletown Police and John Johnson. Documentation is under lock & key and supervised by John Johnson.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Emergency Exit Plan	Water Plant Office	Bill Jones	10/25/2003
Description:	Floor Plans and Emergency Exit Routes are in the main plant entrance hallway, the lower level stairwell, and in the upper level stairwell.		
Policy/Plan	**Location**	**Responsible Party**	**Date**
Mutual Aid Agreement	Water Plant Office	John Johnson	10/25/2004
Description:	Friendly U.D. agrees to provide 500,000 gallons of water per day for up to 14 days in an emergency. An extension or revision of the plan past 14 days must be agreed upon by both parties. Staff, vehicles, parts, etc will also be provided in an emergency on an as needed basis. See agreement for details.		

3. Mission Statement

A mission statement should be written to clarify the purpose of an EOP and give participants a focus in the emergency response planning process. List several goals that reflect the water systems obligation to protect the health and safety of customers and to protect the assets of the water system. The objective should be to maintain and/or restore safe and reliable drinking water after an emergency.

Figure 3. Mission Statement (Template A-3) with five emergency planning goals.

Mission Statement and Emergency Planning Goals	
Mission Statement:	In the event of an emergency at Middletown Water System (MWS), the water system management and staff will take action to protect the health of our customers. MWS has an emergency response plan in place that will allow us to respond immediately to a variety of events that may compromise the water supply. MWS will restore water service as quickly and efficiently as conditions permit.
Emergency Planning Goals:	To quickly and thoroughly analyze the type and severity of the emergency.
	To take immediate action to save lives, reduce injuries and minimize system damage.
	To determine if the water is safe to drink and notify customers of any appropriate protective actions (e.g., issue Boil Water or Do Not Drink Notices).
	To remain in compliance with state and federal Drinking Water Regulations during an emergency response.
	To repair damaged water system components in a prioritized schedule to return the system to normal operations as quickly as possible.

C. Eight Elements of an Emergency Operations Plan

1. System Specific Information

Basic water system information should be readily available for system personnel and external parties (law enforcement, emergency responders, vendors, news media, etc.) in an emergency response. Each component of the water system, from water source to the distribution system should have a data sheet that gives pertinent information. These data sheets should be produced in a "rip-and-run" format that can be removed from the main EOP document and copied for distribution as necessary during an emergency response. Templates for 35 water system data sheets are available in Appendix A. Complete a data sheet for each component that applies to your water system.

a. Water System Information

A data sheet containing general water system information should be completed. Figure 4 shows Template A-4, Water System Information, as completed for a typical water system.

Figure 4. Water System Information (Template A-4).

System Name:	Middletown Water System						
PWSID#:	0000123	**County:**	Anderson		**EFO Region:**	Nashville	
Address:	212 Main Street						
City:	Middletown			**State:**	TN	**Zip Code:**	3XXXX
Office Phone:	123-XXX-XXXX	**Plant Phone:**	123-XXX-XXXX		**Fax:**	123-XXX-XXXX	

Figure 4. Water System Information (Continued)

E-mail:	jjohnson@middletownwater.org	**Website:**	NA
Owner (if other than System Name):	Middletown Water System		
Emergency Response Coordinator (ERC):	John Johnson		
Number of Employees:	18	**Number of Certified Plant Operators:**	4
Number of Certified Distribution Operators:	3		
Emergency Operations Center (EOC):	Middletown Water System Office		
Address:	212 Main Street		
City:	Middletown	**State:** TN	**Zip Code:** 3XXXX
EOC Phone:	123-XXX-XXXX	**EOC Fax:**	123-XXX-XXXX
EOC E-mail:	jjohnson@middletownwater.org	**EOC Website:**	NA
Directions to EOC:			
The EOC will operate from the Middletown Water System Office at 212 Main Street. It is a brick building in downtown Middletown. From Interstate 15, exit I-15 at exit #205, take State Route 40 North 3.3 miles to town of Middletown. S.R. 40 becomes Main Street in Middletown. Cross the railroad tracks and go through two traffic lights. Office is on the right.			
Directions to Office:			
Middletown Water System Office is at 212 Main Street. It is a brick building in downtown Middletown. From Interstate 15, exit I-15 at exit #205, take State Route 40 North 3.3 miles to town of Middletown. S.R. 40 becomes Main Street in Middletown. Cross the railroad tracks and go through two traffic lights. Office is on the right.			
Directions to Water Plant:			
See John Johnson, Water Plant Manager or ERC			
Service Area Boundaries:			
The service area of Middletown Water System has the following boundaries: Eastern boundary is the Fox River; Western boundary is the Boone/Anderson County line; Northern Boundary is State Line Rd.; and Southern boundary is the Smith/Anderson County line. (See J. Johnson for system maps.)			
Electric Company:	Tennessee Electric Service	**Natural Gas Company:**	Tennessee Gas
Phone Company:	Mid-South Phone Company	**Cell Phone Company:**	ABC Wireless
Number of Connections:	9,569	**Population:**	28,000
Residential Connections:	9,280	**Commercial/Industrial Connections:**	289
Average Daily Water Demand:	7 MGD	**Peak Daily Water Demand:**	10 MGD

b. Maps and Critical Information

The location of distribution maps, detailed plan drawings, site plans, valve and hydrant maps/books, process flow diagrams, operation reports, operating manuals, permits, etc., should be referenced in the EOP. Quick access to critical maps and plans is very important in an emergency response. Maps and other critical plans may be kept in a secure location and made available on a "need-to-know" basis at the discretion of the water system manager. Maps should be updated on a regular basis to make sure they are accurate when needed in an emergency. Duplicate copies of critical maps should be kept at a secure off-site location.

Figure 5. Location of Maps and Critical Information (Template A-5).

Description	Date	Location	Produced by	Contact Person
GIS Map of MWS Distribution System	10/18/05	Main Server & Wall Map	Kelly Engineering	John Johnson or Don Wilson, PE
11 x 17" Bound Maps of Distribution System	3/05/01	File Cabinet in Office	Kelly Engineering	John Johnson or Don Wilson, PE
Valve Book	6/08/03	File Cabinet in Office	Middletown Water Dept.	John Johnson
GIS Map of all Valves & Hydrants	12/06/05	Main Server & Wall Map	Kelly Engineering	John Johnson or Don Wilson, PE

Figure 5. Location of Maps and Critical Information (Continued)

Description	Date	Location	Produced by	Contact Person
Overall Process Flow Diagrams	10/31/04	#1 File Cabinet in Office	Kelly Engineering	Don Wilson, PE
Water Treatment Building Floor Plan	10/31/01	#1 File Cabinet in Office	Kelly Engineering	Don Wilson, PE
Water Treatment Plant Site Map	10/31/03	#1 File Cabinet in Office	Kelly Engineering	Don Wilson, PE
SOP Manuals	3/30/03	#2 File Cabinet in Office	Middletown Water Dept.	John Johnson
MOR File	Current	#2 File Cabinet in Office	Middletown Water Dept.	John Johnson
Permits	Current	#1 File Cabinet in Office	Middletown Water Dept.	John Johnson

c. Water Source

Water source templates are included in Appendix A for surface water (A-6), well water (A-7), purchased water (A-8) and spring water (A-9). Figure 6 illustrates a completed Surface Water Template (A-6).

Figure 6. Surface Water Source (Template A-6).

Raw Water Source (Surface Water): Fox River

Land Location: Approx. 613 River Road **River Mile** 28.6

Latitude: Ask John Johnson or ERC **Longitude:** Ask John Johnson or ERC

Description of Surrounding Area:

Residential neighborhood with large lots (1.5-2 acre) on river. Residences to East, and 60 acres of vacant heavily wooded land to West. Across river is residential subdivision and city park.

Intake Pipe Size: 24”

Distance into River/Stream: 120 ft.

Fixed Level or Variable Level Intake: Fixed

Description of Intake Building/ Structure:

Concrete block foundation, concrete floor, wood frame and brick veneer walls. No Windows. One steel door with keyed deadbolt lock.

Raw Water Pumps:	Manufacturer/Type	H.P.	Capacity	Yr. Installed
#1	ABC Pump Company	600	6 MGD	2000
#2	ABC Pump Company	400	4 MGD	1990

Chemicals added at Intake:	Quantity stored at intake building:
Potassium permanganate	150 kg. (six 25-kg. containers)
Activated charcoal	1,000 lbs. (twenty 50-lb. bags)

Other Materials Stored at Intake Building: None

Raw Water Lines to Water Plant:	Pipe Dia.	Material	Distance	Depth
#1 (west pipe)	24”	Cast iron	1,000 yds.	4’
#2 (east pipe)	16”	Cast iron	1,000 yds.	4’

Data Sheet templates (A-10 through A-21) for the following water system components are included in Appendix A. Complete any of the data sheets that apply to your system. Edit the templates as necessary to list the details of your system. Other data sheet formats may be used to provide system information.

d. Water Treatment Processes (A-10)
e. Distribution System (A-11)
f. Pumping Facilities (A-12)
g. Storage Facilities (A-13)
h. SCADA System (A-14)
i. Chemical Inventory (A-15)
j. Materials & Parts Inventory (A-16)
k. Critical Customers (A-17)
l. Largest Customers (A-18)
m. Security Features (A-19)
n. Communication Equipment (A-20)
o. Office Computer Equipment (A-21)

2. Roles and Responsibilities

a. Chain of Command

In an emergency, system personnel should know where to report, to whom they report, and what their responsibilities are during an emergency response. A Chain of Command establishes lines of authority that preserve order and prevent confusion. The chain-of-command document is another essential part of an EOP. Check this document at least quarterly to confirm the accuracy of personnel and phone numbers.

Figure 7. Chain of Command (Template A-22).

Emergency Response Chain of Command	
Call 911 for fire, police, or medical emergencies. Call the following, starting with the #1 position, until all personnel are contacted. This list is the chain of command that will be followed in an emergency response.	
1	**Name:** John Johnson
	Title: Water System Manager and Emergency Response Coordinator (ERC)
	Office Phone: 123-XXX-XXXX
	Home Phone: 123-XXX-XXXX
	Cell Phone: 123-XXX-XXXX
	Pager: 123-XXX-XXXX
	Radio: 123-XXX-XXXX
2	**Name:** Bill Jones
	Title: Water Plant Manager (Alternate ERC)
	Office Phone: 123-XXX-XXXX
	Home Phone: 123-XXX-XXXX
	Cell Phone: 123-XXX-XXXX
	Pager: 123-XXX-XXXX
	Radio: 123-XXX-XXXX

Figure 7. Chain of Command (Continued)

3	**Name:** David Pipes
	Title: Distribution Supervisor
	Office Phone: 123-XXX-XXXX
	Home Phone: 123-XXX-XXXX
	Cell Phone: 123-XXX-XXXX
	Pager: 123-XXX-XXXX
	Radio: 123-XXX-XXXX
4	**Name:** Mary Miller
	Title: Office Manager
	Office Phone: 123-XXX-XXXX
	Home Phone: 123-XXX-XXXX
	Cell Phone: 123-XXX-XXXX
	Pager: 123-XXX-XXXX
	Radio: 123-XXX-XXXX
5	**Name:** Harold Smith
	Title: Field Manager
	Office Phone: 123-XXX-XXXX
	Home Phone: 123-XXX-XXXX
	Cell Phone: 123-XXX-XXXX
	Pager: 123-XXX-XXXX
	Radio: 123-XXX-XXXX

b. Emergency Response Coordinator

The first response in any emergency is to notify the lead person (the person at the top of the chain of command). This guidance document refers to the lead person as the Emergency Response Coordinator (ERC). An alternate ERC should be designated in case the primary ERC is unavailable. The ERC will assess the emergency and initiate the appropriate response actions. The ERC will manage the entire emergency response unless an Incident Command Structure (ICS) facilitates a transfer of command. After the ERC prioritizes and supervises water system repairs, the system should be returned to normal operations.

**Note:* Any reference to "ERC" in this document is a reference to the lead person in an emergency response. You are not required to use the acronym "ERC" for the lead person in your Emergency Operations Plan. Emergency Operations Coordinator (EOC), Emergency Operations Leader (EOL), Incident Commander (IC), and Water Utility Emergency Response Manager (WUERM) are used by different sources to represent the lead person in an emergency response.

c. Incident Command System

In a major disaster, emergency or terrorist act, the ERC may need to initiate and/or defer to an Incident Command System (ICS). ICS is the model tool for coordinating the response efforts of several agencies as they work an emergency response. If another agency takes over command in an ICS situation, the ERC and water system personnel remain in charge of all water system repairs and operations. See References and Links for training and resources on ICS.

3. Communication Procedures

a. Internal Contact List and Responsibilities

Contact information should be maintained for all people that may need to respond in an emergency. Template A-23, Water System Contact List, may be used to log contact information. Spreadsheet, e-mail or contact information software are excellent tools for keeping contact information. A check of names, phone numbers, etc. should be made quarterly to ensure that the phone list is always up to date. List home and cell phone numbers so personnel can be contacted during the day or night. If contact information has changed, print out a new contact list and distribute to all copies of the EOP. Back up the address book/list/file regularly as part of your standard operating procedures. Store the back-up file at a secure off-site location.

Figure 8. Water System Contact List (Template A-23). See A-23 for more contact listings that should be considered for inclusion in this list.

Name:	John Johnson	**Title:**	Manager of Middletown Water System; ERC during Emergency Response		
Emergency Response Responsibilities:	Responsible for overall management and decision making for the water system during an emergency response. Emergency Response Coordinator (ERC) during the emergency response. ERC evaluates threats, diagnoses emergency and level of response required, supervises staff, sets priorities, and provides information to mayor, regulatory agencies, public, and news media. All communications to external parties must be approved by the ERC.				
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell Phone:**	123-XXX-XXXX
Pager:	123-XXX-XXXX	**Radio Call No:**	123-XXX-XXXX		
E-mail:	jjohnson@middletownwater.org				
Name:	Bill Jones	**Title:**	Chief Operator and Alternate ERC		
Emergency Response Responsibilities:	In charge of filter plant operations including the SCADA system. Evaluates damage, decides sampling procedures, relays critical information, provides recommendations to ERC. Supervises 2 certified operators and performs other duties as requested by the ERC.				
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell Phone:**	123-XXX-XXXX
Pager:	123-XXX-XXXX	**Radio Call No:**	123-XXX-XXXX		
E-mail:	bjones@middletownwater.org				

Figure 8. Water System Contact List (Continued)

Name: David Pipes		**Title:** Water Distribution II Operator	
Emergency Response Responsibilities:	In charge of the operation of all pump stations, storage tanks and pipes in the distribution system. Evaluates damage/contamination to distribution/storage system, provides recommendations to Chief Operator and System Manager on isolation and/or repairs to system. Supervises 2 distribution operators and performs other duties as requested by ERC.		
		Home	**Cell**
Office Phone: 123-XXX-XXXX		**Phone:** 123-XXX-XXXX	**Phone:** 123-XXX-XXXX
Pager: 123-XXX-XXXX		**Radio Call No:** 123-XXX-XXXX	
E-mail: NA			
Name: Mary Miller		**Title:** Office Administrator	
Emergency Response Responsibilities:	In charge of all office functions to help maintain orderly and quick response to emergency. Supervises 2 office assistants. Keeps log of emergency response events. Answers phone calls/questions with pre-scripted message. Directs production of printed materials as necessary. Tracks itemized cost of emergency labor and materials. Performs other duties as requested by ERC.		
		Home	**Cell**
Office Phone: 123-XXX-XXXX		**Phone:** 123-XXX-XXXX	**Phone:** 123-XXX-XXXX
Pager: 123-XXX-XXXX		**Radio Call No:** 123-XXX-XXXX	
E-mail: mmiller@middletownwater.org			
Name: Harold Smith		**Title:** Water Distribution I Operator	
Emergency Response Responsibilities:	Repairs breaks in the water lines. Orders fuels and chemicals necessary for operation of water treatment processes. Performs miscellaneous duties as directed by ERC and/or Chief Operator.		
		Home	**Cell**
Office Phone: 123-XXX-XXXX		**Phone:** 123-XXX-XXXX	**Phone:** 123-XXX-XXXX
Pager: 123-XXX-XXXX		**Radio Call No:** 123-XXX-XXXX	
E-mail: NA			

b. External Contact List

Contact information for individuals and agencies outside of the water system should be available during an emergency. Assemble a comprehensive external contact list and review the list for accuracy of information four times a year. Obtain cell phone or 24-hour emergency numbers for all external contacts. Emergencies often strike in the middle of the night and a quick response relies on your ability to immediately contact suppliers and critical customers.

Below is an abbreviated example of an external contact list. Template A-24 in Appendix A contains a more extensive listing of external contacts. Include local police, fire and first responders, EMA, LEPC, local government (mayor, chamber of commerce), local media (TV, radio, newspapers), utilities (electric, natural gas, phone) cell phone companies, diesel fuel suppliers, outside vendors (water plant pipes/parts, chemicals, computer controls, SCADA software), contractors, pump specialists, electricians, plumbers, regulatory agencies (TN Div. of Water Supply, TN Dept. of Health), critical customers (hospitals, nursing homes, assisted living facilities, daycares, schools), largest customers, and water testing laboratories.

A list of commercial laboratories approved for drinking water analysis is available at the DWS website:
http://www.tn.gov/environment/dws/drinking_water_program.shtml#reports

The TN Dept. of Homeland Security should be notified of any acts against the water system that may be caused by terrorists. The Federal Bureau of Investigation (FBI) is the lead agency in any suspected terrorist attacks and should be notified if an act of terrorism is suspected.

Tennessee water systems are required to notify the Division of Water Supply and responsible local officials immediately of "any situation with the water system which presents or may present an imminent and substantial endangerment to health." (Rule 1200-5-1-.18(2))

Figure 9. External Contact List (Template A-24). See A-24 for more External Contacts (TN Dept. of Homeland Security, Media, Alternate Water Supplies, Mutual Aid Agreement Utilities, Hospitals, Red Cross, etc.) that should be considered for inclusion in this list.

Local Law Enforcement					
Name:	John Brown	**Title:**	Chief of Police		
Agency:	Middletown Police Dept.	**Address:**	123 Main St., Middletown, TN 3XXXX		
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell:**	123-XXX-XXXX
Pager:	123-XXX-XXXX	**e-mail:**	jbrown@cityofmiddletown.tn.us		
Fire Department					
Name:	Tom Miller	**Title:**	Fire Chief		
Agency:	Middletown Fire Dept.	**Address:**	500 Center St., Middletown, TN 3XXXX		
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell:**	123-XXX-XXXX
Pager:	123-XXX-XXXX	**e-mail:**	tmiller@cityofmiddletown.tn.us		
County Emergency Management Agency (EMA)					
Name:	Glenn Smith	**Title:**	Director		
Agency:	Anderson County EMA	**Address:**	123 Oak St., Middletown, TN 3XXXX		
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell:**	123-XXX-XXXX
Pager:	123-XXX-XXXX	**e-mail:**	gsmith@cityofmiddletown.tn.us		
Local Emergency Planning Committee (LEPC)					
Name:	Bobby Anderson	**Title:**	Manager		
Agency:	Anderson County Civil Def.	**Address:**	456 Main St., Middletown, TN 3XXXX		
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell:**	123-XXX-XXXX
Pager:	123-XXX-XXXX	**e-mail:**	NA		
Mayor					
Name:	Fred Jones	**Title:**	Mayor		
Agency:	Town of Middletown	**Address:**	789 Main St., Middletown, TN 3XXXX		
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell:**	123-XXX-XXXX
Pager:		**e-mail:**	Fjones@cityofmiddletown.tn.us		
Neighbor Water Utility					
Name:	Fred Partner	**Title:**	Friendsville Water Plant Manager		
Agency:	Friendsville Water UD	**Address:**	258 Neighbor Lane		
Office Phone:	123-XXX-XXXX	**Home Phone:**	123-XXX-XXXX	**Cell:**	123-XXX-XXXX
Pager:		**e-mail:**	fpartner@friendsville.tn.us		

c. Emergency Communications Plan

Communication system procedures should be documented. An alternative communications plan should be included in your EOP in the event that land phones, cell phones, or walkie-talkie phones are inoperable immediately after a large-scale emergency (earthquake, tornado or terrorist attack). The ERC should communicate with cellular phone companies on the availability of priority channels during an emergency. Satellite phones should also be considered.

Figure 10. Example of Emergency Communications Plan (Template A-25).

Emergency Communications Plan	
1	Walkie-talkie phones will be the first line of communication in an emergency. If walkie-talkie phones are inoperable, land phones, personal cell phones, and/or 2-way radios should be used to communicate with water system staff and external responders. Office manager will attempt to call phone company/cell phone company to request priority in restoring cell phone signals. (Two trucks and the office currently have three pair of 2-way radios. Two additional pair of 2-way radios are located in the manager's office at the Water System Office.) Do not use 2-way radio for communications that should not be released to the public.
2	If phone and radio communication are inoperable, water system personnel should drive to the Emergency Operations Center (EOC) for emergency communications/assignments. Responders should communicate in person by walking or driving until phone service is restored.
3	Contact TEMA immediately for communication/emergency management assistance.

d. Effective Communications

Plan how you will communicate with customers and the media before an emergency strikes. Maintaining positive public perception is very important. Improve the public's confidence in the water supply and the water department's ability to provide safe potable water. Meet with reporters in your local area to share information about your water system and develop guidelines for reporting information in an emergency. Designate a main spokesperson. The spokesperson should be in a position of authority and be very credible. Prepare fact sheets and media releases ahead of time in order to communicate effectively during a crisis. When emergency does strike, restrict media to a safe, remote location. Develop key message points that are clear, brief and accurate. Emphasize that public health is the main concern and that the utility is doing everything within its power to fix the problem. Admit to the concerned consumers that your knowledge may be limited now and announce that more information will follow. Assign staff to answer concerned customers questions and phone calls with a scripted message. Instruct staff to respectfully defer questions from the media to the designated spokesperson. Document all media communications for future reference. The ERC should sign off on all media communications. Do not use 2-way radio communications for confidential information that should not be released to the public. Template A-26, Public Communications Guidelines, should be completed early in the planning stages in order to designate a media spokesperson. Write a media announcement for use in an action plan during an emergency response.

Coordinate all public messages with local, state and federal officials as necessary. An emergency may require the public water system to notify its customers due to a violation of the national primary drinking water regulations or other situations. Public notice requirements are divided into three tiers that take into account the seriousness of the violation or situation and any potential adverse health effects that may be involved. (Tier 1 notices are the most serious and are required for violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.) Tennessee DWS Rules (Section 1200-5-1-.18 and .19; Reporting Requirements and Notification of Customers) explain public notice tiers and give guidelines for the content of the public notice. (See References and Links.)

Remember to edit very carefully any public notifications to reflect the current status of your water system. A "Drinking Water Warning" for nitrate contamination is very different from a "Boil Water Notice" due to an E. coli contamination. (See Appendix D.) If 10% of the population speaks Spanish or another language, an additional translated version should be made available. This is especially true in Tier 1 notices where the community health risk is greatest. The EPA guidance document "Revised Public Notification Handbook" (EPA 816-R-07-003, March 2007) contains information on public communication strategy and contains sample public notices in English and Spanish. (See References and Links.)

Figure 11. Public Communications Guidelines (Template A-26).

Public Communications Guidelines		
	Name	**Title**
Primary Spokesperson	John Johnson	Manager
Alt. Spokesperson	Bill Jones	Chief Operator
Print Communications	Mary Miller	Office Manager
Emergency Category:	Major Water Line Break	
Message:		
We are experiencing a water problem in the southeast portion of Middletown. The Water Dept. is attempting to find the problem and correct it as quickly as possible. As soon as we find the leak or problem, we will provide more information. We are asking all customers to conserve water. And as a precautionary measure we have issued a Boil Water Notice. Until further notice, bring water to a rolling boil for one minute. Allow the water to cool before using for drinking or cooking. Use boiled or bottled water for drinking, making ice, brushing teeth, washing dishes, and preparing food until further notice. Boiling kills bacteria and other organisms that may have entered the water through a leak or break in the water line. We anticipate resolving the problem within 48 hours. We will inform you when there is no longer a need to boil your water. For more information, continue to watch local TV and listen to local radio for updates on the water supply. You may contact the Middletown Water Dept., at 123-XXX-XXXX with any questions. Please share this information with the elderly or other people who may not see or hear this important news.		

4. Personnel Safety

The water system should have procedures for securing the safety of utility personnel and the immediate community. Complete a Personnel Safety Checklist. Schedule training sessions to train personnel on basic safety procedures, alarm response, first aid, Personal Protection Equipment (PPE) usage and evacuation procedures. Emergency situations that would necessitate an evacuation of the water treatment plant and/or site should be identified. Exit signs and evacuation routes should be posted prominently.

Figure 12. Personnel Safety Checklist (Template A-27).

Personnel Safety Checklist	
Safety Item	**Description**
Security Alarm	ABC is the vendor for the commercial security system installed at the main office and water treatment plant. Upon activation, ABC, the Water System Manager and the police are notified. A complete alarm system diagram and operating manual is under the supervision of Manager J. Johnson.
Fire & Smoke Alarm	Fire and smoke detectors are included in the ABC system. They are located in every room and also in the return air conditioning/heater vents of the central heat/air system. Fire/smoke alarm activation automatically notifies fire dept. and ABC. ABC then notifies Manager J. Johnson
Security Cameras	A commercial surveillance camera system is installed at the office and water treatment plant. Operator B. Jones is the supervisor of this system and has detailed plans and operating manuals.
Building Exits	Exit signs are posted above all exit doors. Directions on exiting the building are posted in the main hallway in the office and the front entrance at the water treatment plant.
Evacuation Plan	J. Johnson makes the decision to evacuate the water plant in an emergency. In his absence, an Evacuation Plan is located in the file cabinet in his office.
Evacuation Route	An evacuation route map is posted in the main hallway in the office and at the front entrance at the water treatment plant.
Assembly Area	In the event of an evacuation, all utility personnel should report to the Middletown Fire Station at 500 Center Street and wait for further instructions.
Personnel Sign-In	Mary Miller is responsible for accounting for all personnel and vendors on site in the event of an emergency. She will maintain a sign-in sheet to account for all personnel.
Signs	B. Jones maintains a list of all posted signs on the interior and exterior of all buildings and fenced properties. Hazardous Chemical, Danger signs, Safety First signs, Warning sign are posted in accordance with OSHA guidelines.
First Aid Station	A large first aid kit is located in the main hallway next to the stairwell to the pipe gallery. Bandages, scissors, sterile gauze, anti-bactericidal cream, tape, scissors, finger splint and more are in the kit.
Emergency Shower	An emergency cold water shower and floor drain are located in the water treatment plant in the main hallway next to the first aid station.
Personal Protection Equipment (PPE)	The fire department has the only PPE equipment in Middletown. In the event of a major chemical leak, call 911 and wait to assist the fire department.
Chlorine Gas Leak	In the event of a Chlorine gas leak, refer to the Chlorine Risk Management Plan. The plan is located in the file in J. Johnson's office. The chlorine gas leak repair kit is located immediately outside the chemical room. J. Johnson, B. Jones, D. Pipes and H. Smith are trained in using the repair kit.
Safety Training	New employees are trained in basic safety procedures during the standard "new employee" training. One annual EOP training exercise will contain a section on safety procedures and emergency evacuation procedures.

5. Alternate Water Sources

Identify the sources and procedures for obtaining a short-term and a long-term alternate water supply in the event of an emergency. If an incident requires a "Boil Water" public notice, no alternative source of water is required. If a "Do Not Drink" notice is issued, alternate water sources must be provided for drinking and food preparation. If a "Do Not Use" notice is issued, alternative water must be provided for drinking, cooking, bathing, and even fire fighting (in certain contamination scenarios). Mandatory water conservation orders may be issued to preserve the supply of drinking water. More public notice information is available from the DWS Environmental Field Office and on the EPA website. (See References and Links.)

If tanker trucks are used to transport or store water as an alternate water source, make sure that you allow time to disinfect the trucks properly. See Appendix E for tanker truck disinfection procedures.

Figure 13. Alternate Water Sources (Template A-28).

Alternate Sources of Water			
Short-Term (Hours-Days) Sources			
A. Adjacent Water Systems			
Water System	**Location of Master Meter**	**Emergency Water Contract**	**Max. Gallons/Day (GPD)**
Anderson U. D.	Sharewater Road at Moores Lane	Yes	300,000
Community U.D.	Highway 40E at Lincoln Highway	No	200,000
B. Alternate Water Sources			
Name	**Description**	**Quantity available in emergency**	**(GPD)**
Acme Bottled Water Co.	1-gallon plastic jugs of purified water	2,000 1-gallon jugs can be delivered within 1 hour. Maximum 4,000 gal./day.	4000 max.
Jersey Dairy Co.	Milk tanker trucks can haul in water.	5,000 gallons/tanker truck. Trucks only available after milk delivery at 4 pm. Allow time for AWWA disinfection procedures. (See Appendix F)	10,000
Long-Term (Weeks-Months) Sources			
A. Adjacent Water Systems			
Anderson U.D. is willing to supply up to 200,000 gallons per day to Middletown Water System on a long-term basis. The emergency assistance contract currently is only for short-term assistance for up to 300,000 per day for a few days. Middletown Water System is talking to Anderson U.D. about signing an aid agreement for a long-term water supply of up to 200,000 GPD for 6 months to a year.			
B. Alternate Water Sources			
Since 200,000GPD will not completely supply Middletown's daily water needs, another long-term water supply is needed. A planning committee (representatives from water system, TAUD, Anderson Engineering, and town council) is currently meeting to find a long-term water supply solution in the event that the current water treatment plant and/or river source were to be permanently shut down for any reason. The construction of another water treatment plant is one option. A long-term Alternate Water Source Plan will be presented to the city council for approval upon completion.			

6. Equipment and Spare Parts

Identify vehicles, special equipment, tools, spare parts and chemicals that can be used to reduce the impact of an emergency. All heavy equipment, portable generators, spare pumps, etc. should be listed here. The need for power generators during a prolonged power outage should be considered.

Figure 14. Equipment and Spare Parts (Template A-29).

Vehicles	Description	VIN or Serial #	Qty.	Location
Diesel Truck	2001 Ford F250	BKU123456789X	1	Main Storage lot
Repair Truck	2003 GMC	ACJ987654321T	1	Main Storage lot
Repair Truck	2005 GMC	ACJ987654356T	1	Main Storage lot
Pick-up Truck	2004 Ford Ranger	LKN567432090D	1	Main Storage Lot
Pick-up Truck	2005 Ford Ranger	LKN567432091D	1	John Rogers
SUV	2006 Ford Explorer	WEF987234185J	1	Main Storage lot
Heavy Equipment				
Backhoe Loader	Caterpillar 416C	123456789ABC	1	Main storage lot
Tools				
Arc Welder	Hobart 50421	98764234HOB	1	Repair Garage
16” Chain Saw	Poulon 2150LE	658214397POU	1	Repair Garage
14” Chain Saw	Poulon 1950LE	325487961POU	1	Repair Garage
Generators				
10,500 Watt Portable Generator	Honda EB1100	98764234HDA	1	Repair Garage
6,000 Watt Portable Generator	Honda EB6500	12345678HDA	1	Repair Garage
Water Testing Equipment				
Chlorine Test Strips	Free Chlorine Test Strips	84305778CLK	12	Chem. Room
Chlorine Monitor	B20 Recording Chlorine Analyzer	443547ARC	1	Chem. Room
Spare Parts				
High-pressure pump	3 MGD	SS#654987321	1	Parts Room
Chemicals (Not listed with plant chemicals)				
Calcium Hypochlorite tablets	50-lb. tub	8775663985CAH	2	Chem. Room
Activated charcoal	50-lb bags	0093334778CHC	20	Chem. Room
2-Way Radios				
Motorola	XU2600 2-watt	987654321MNL	4	Main Office
Other				
Honda 4-wheeler	2004 Model 400EX	XYZ654987JKL	1	Repair Garage

7. Property Protection

Protecting the water facility during an act of terrorism or a natural disaster will expedite the restoration of water services. Establish a procedure for locking down the facility and establishing a secure perimeter to the plant grounds and buildings. The following guidelines for first responders to an emergency should be reviewed with your water system staff. Train personnel to preserve a crime scene in the event of a potential criminal act against the water system. Good evidence is invaluable in a criminal investigation.

a. Enter a potential crime scene with caution. If you suspect adversaries are still present, call 911 for emergency medical services, fire and/or police assistance.
b. The ERC will communicate with local police and emergency response teams and decide if the building should be locked down and the site perimeter secured.
c. Scan the entire area and note any persons or vehicles in the vicinity.
d. Look, listen and smell for dangerous signs. Remain alert and assume the crime is ongoing until determined otherwise.
e. If victims are encountered, assess their physical condition, provide comfort and medical attention (if trained).
f. Do not clean up, remove items or otherwise disturb the crime scene.
g. Document any statements/comments made by victims, suspects or witnesses on the scene.
h. After the site is secure and victims are stabilized and under the care of emergency medical personnel, begin assessing potential contamination and/or damage to the water system.
i. Follow the water system's Emergency Operations Plan.

Figure 15. Property Protection Guidelines (Template A-30).

Property Protection Guidelines	
ERC	John Johnson
The ERC will communicate with local police, fire, and emergency response teams. If the decision is made to lock down any facilities and/or secure the perimeter of the water plant site, follow the following procedures:	
Event	**Procedure**
Lockdown	Lock all exterior doors to the water treatment building. The building floor plan is in the EOP and on the break room bulletin board. There are 4 exit doors on ground level and 2 exit doors on the second floor level. Post guards from water system and/or local police at the doors. No one is allowed to enter or leave the building. Leave your post only if your safety is endangered. Stay in touch with the EOC and ERC via walkie-talkie phones.
Secure the Perimeter	A water plant site map is in the break room and in the EOP. Post guards at the card key main entrance gate, intake building front gate, intake building (facing river side), the permanently locked North gate and East gate until further notice. Allow only authorized personnel with proper identification to enter the site.
Preserve the Crime Scene	A responder's first concern is to save lives and/or give first aid to victims. Secondary to this goal, make an effort to preserve evidence. Do not remove anything from a potential crime scene. The malevolent act may be caused by a criminal or terrorist.
Document Comments & Observations	After the critical stage of the emergency is over, record all comments heard during the initial stages of the emergency and any observations of the building, water treatment equipment and exterior.

8. Water Sampling and Monitoring

A plan for water sampling and monitoring should be in place in order for the ERC to make good decisions when evaluating water contamination threats. Division of Water Supply Staff and approved water testing laboratories should be consulted to determine appropriate testing and sampling. Consider the following issues in water sampling and monitoring:

a. Maintain records for all current and past sampling and analytical requirements. These records will be useful in establishing a baseline in a water contamination threat evaluation.

c. Sampling procedures should be outlined for:

i. Decision-making process to determine the tests to run.
ii. Location and/or source of test kits and/or sample containers.
iii. When to use preservatives or dechlorinating agent.
iv. Sample quantity to collect.
v. Proper collection procedures.

d. Identify the certified operator or team (and alternates) who is/are responsible for taking the samples.

e. Identify the appropriate shipping and/or transportation procedures to be used in getting the samples to an approved laboratory. ASAP and regular delivery methods should be outlined.

f. Maintain a list of TN DWS approved laboratories and confirm with the laboratory via phone their current certification and ability to perform the required tests on an emergency basis. (See References and Links.)

g. Procedure for interpreting or monitoring test results.

For more planning information on water sampling and monitoring, please refer to the USEPA's Response Protocol Tool Box Module 3, "Site Characterization and Sampling Guide" (EPA-817-D-03-003) and Module 4, "Analytical Guide" (EPA-817-D-03-004). (See References and Links.)

Figure 16 . Water Sampling Plans (Template A-31).

Water Sampling Plans			
Description	**Date**	**Location**	**Contact Person**
Bacteriological Sampling Site Plan	10/18/06	#2 File Cabinet Office	John Johnson
Drinking Water Monitoring Program	6/08/06	#2 File Cabinet Office	John Johnson
Total Organic Carbon (TOC) and Enhanced Coagulation Report	3/05/07	#3 File Cabinet Office	John Johnson
Disinfectant Monitoring and MDRL Compliance Report	12/06/07	#3 File Cabinet Office	John Johnson
Disinfection By-product Monitoring Plan	7/30/07	#2 File Cabinet Office	John Johnson
Chemical Analysis Reports	Current	#2 File Cabinet Office	John Johnson

D. Water Conservation and Drought Management

Drought results from a lack of precipitation over an extended period of time. Drought can occur in any region of the country. Public water systems and local communities should plan for conditions of low water supply by having an approved drought management plan in place. Guidance for developing a drought management plan is available in the DWS document, *Guidance for Developing Community Water System Drought Management Plans, Dec. 2009*. (See References and Links.) When pre-determined trigger points are reached, water conservation measures outlined in the plan should be activated by the local government or water system. A drought management plan may include but not be limited to the following restrictions on non-essential water uses:

1. Use of water to wash any motor vehicle, motorbike, boat, trailer, or airplane, or other vehicle.

2. Use of water to wash sidewalks, driveways, decks, home siding, gutters, parking lots, or other hard-surfaced areas.

3. Use of water to irrigate lawns, trees, shrubs, plants and flowers.

4. Use of water to fill indoor or outdoor swimming pools or hot-tubs.

5. Use of water in a fountain or pond except where necessary to support aquatic life.

6. Use of water from a fire hydrant for other than fire fighting purposes.

A public education program should be part of the water conservation plan. Voluntary water conservation measures should be emphasized, e.g., take short showers, do not allow water to run while brushing teeth or shaving, fix leaky faucets and running toilets, collect rainwater for watering plants, gardens, and flowers. Extensive drought management information is available on the web. The Tennessee Department of Environment and Conservation (TDEC) produced the document, *Drought Management Plan* (Revised Feb. 2010). The EPA has a number of publications and other resource materials on water conservation. The National Drought Mitigation Center (NDMC), established in 1995, is an excellent resource for drought planning. (See References and Links.)

E. Threat Evaluation

All threats made to the water system should be taken seriously. Threats may be reported or delivered in many different forms: a consumer complaint of water taste or odor, a witness account of tampering with a water tank, a phone call from the alleged perpetrator, or an emergency room reporting patients with symptoms developed after drinking water. Decisions must be made quickly to react to the threat properly. The threat must first be evaluated to determine if it is possible. Then it must be determined if it is a credible threat. Finally, the threat must be confirmed. One of the Emergency Response Coordinator's responsibilities is to evaluate the credibility of any threat. Emergency action plans will be activated based on the ERC's evaluation and investigation of the threat. The ERC and water system personnel should train on threat evaluation as part of

emergency response training. The ERC must use good judgment when making emergency response decisions concerning threats to the water system. More information on threat evaluation is available from the EPA's Response Protocol Toolbox (RPTB). (See References and Links.)

A Threat Identification Checklist should be kept next to every phone at the office and water treatment plant. If a threat is received, the checklist should be completed. The recorded information will be important to the emergency response team in evaluating the threat. An example of a completed Threat Identification checklist is shown in Figure 17. If the threat comes in e-mail, save the e-mail on the computer, print out a paper copy, and notify your supervisor.

If you receive a **suspicious letter or package**, set it aside and do not open it. Calmly instruct everyone to leave the room immediately. Close the door. Wash your hands with soap and warm water. Notify your supervisor and/or call 911 if a suspicious substance is visible.

Figure 17 . Threat Identification Checklist (Template A-32).

Threat Identification Checklist													
In the event your water system receives a threatening phone call, remain calm, let the caller speak and try to keep the caller on the line as long as you can. Record as much of the caller's conversation as possible. Use this sheet to collect detailed information. Notify your supervisor after the call and do not tell anyone else.													
Date:	02/15/2006					**Time of Call**:	7:30 am						
Caller's Exact Words:	"I poisoned the water because you didn't make things right."												
Ask the Caller:	Who are you?					Message was left on answering machine before office hours—therefore no questions were asked							
Where are you?						What do you want from us?							
What are you going to do?						Why are you doing this?							
When did you do this?													
Where did you do this?	Storage tank/hydrant/raw water source/treatment plant					Nonspecific							
What kind of threat? Biological/chemical/explosive						Nonspecific							
Contaminant Name?						Quantity?							
Caller's name, address and telephone number (ask or copy from Caller ID):													
Male:	x	Female:		Adult:		Teen:		Child:		Approximate age:	50-60		
Check any characteristics that apply to the caller:													
Voice:		**Speech:**		**Accent:**		**Word Choice:**		**Manner:**		**Background:**			
Loud	x	Fast	x	Local	x	Very educated		Calm		Talking			
Soft		Slow		Foreign		Average	x	Nervous		Laughing			
Deep	x	Nasal		Race		Illiterate		Excited		Music/Radio/TV			
Normal		Drunk	x	Region		Foul		Angry	x	Machinery			
Pleasant		Slurred		Other		Incoherent		Laughing		Traffic	x		
Whisper						Other		Crying		Animals			
Taped Message								Reading Message		Children			
										Quiet			
Call received by:	Mary Miller												
Others in office at time of call:	Susan Day												
Water System Name:	Middletown Water System												

F. Follow-up EOP Activities

1. EOP Approval and Review Date

A log should be maintained for both the approval of the EOP and the distribution of the EOP. The EOP is a living document and will need to be updated when significant changes are made to the water treatment plant and/or water system operations or when required by state or federal regulatory agencies. TN Division of Water Supply recommends that you **update your EOP every two years**. Identify the key individuals that will approve the EOP early in the emergency operations planning process.

Figure 18. EOP Approval List (A-33)

The EOP should be approved and signed by the following people.			
Name	**Title**	**Signature**	**Date**
John Johnson	Water System Manager	*John Johnson*	12/31/2006
Will Sanders	Chairman, Board of Commissioners	*Will Sanders*	12/31/2006
Bill Jones	Chief Operator	*Bill Jones*	12/31/2006
Tom Miller	Captain of Fire Dept.	*Tom Miller*	12/30/2006

2. EOP Distribution

The people or agencies that receive a copy of the EOP may be different than those who sign off on the EOP. Some parts of the EOP may be sensitive documents and access should be restricted to authorized personnel. Copies of the EOP should be numbered for control purposes and a log should be maintained for recording the location, EOP copy #, name of recipient, title, signature and the distribution date.

One copy of the EOP should be stored at a secure off-site location. A minimum of one copy should be stored at each building where personnel may be located when an emergency occurs.

Figure 19. EOP Distribution List (Template A-34)

The EOP should be distributed to the following locations/people/agencies.					
Location	**EOP#**	**Name (Printed)**	**Signature**	**Title**	**Date**
Water Plant	1	John Johnson	*John Johnson*	Water System Manager	12/31/2006
Water Plant	2	Bill Jones	*Bill Jones*	Chief Operator	12/31/2006
Office	3	Mary Miller	*Mary Miller*	Office Manager	12/31/2006
Secure Offsite	4	Mary Miller	*Mary Miller*	Office Manager	12/30/2006
Fire Dept.	5	Tom Miller	*Tom Miller*	Captain Fire Dept.	1/18/2006
Police Dept.	6	John Brown	*John Brown*	Police Chief	1/18/2006

3. Training Exercises

An Emergency Operations Plan will benefit the water system in an emergency if it has been tested and the water system personnel are familiar with their responsibilities. All personnel should participate in a minimum of one EOP training exercise per year. Valuable lessons will be learned from the training exercises. The EOP should be revised as necessary to create an improved tool for a real emergency response. Training may consist of any of the following exercises:

1. Orientation or Classroom Sessions—Basic instruction on EOP procedures
2. Tabletop Workshop—fabricated event, questions with actions/verbal responses, and close with an evaluation
3. Functional Exercises—team of simulators develops a realistic major event and water system staff and first responders respond to the event as it develops
4. Full-Scale Drills—emergency response personnel and equipment are mobilized to a scene based on an emergency scenario and an ERP response is activated. (More costly and realistic than functional exercise.)

Figure 20. EOP Training Schedule (Template A-35).

EOP Training Schedule			
Event	**Description**	**Participating Organizations**	**Date**
Practice Drill	Phone call threatening contamination of water system	Water system staff	Annually, unannounced
Workshop	2-day EPA Emergency Response Workshop	EPA instructors, water system managers	07/07/06
Tabletop Exercise	Review EOP with staff/fire/ police/ LEPC/TEMA	Water system staff/ fire/ police/ LEPC/TEMA	10/12/06
Practice Drill	Chlorine release response	Police, fire dept. and staff	02/2007

G. Emergency Action Plans

Action plans are basic guidelines and procedures contained in an EOP to be followed in response to specific emergencies. If confidential and/or sensitive information is included in any action plan, this section should be stored under lock in a secure location. This action plan can be referenced in the EOP document and distributed on a need to know basis during an actual emergency. Write action plans for any of the following emergencies that are potential threats to your water system. The Terrorism Act of 2002 requires that water system EOPs contain action plans for terrorist threats (1a, 1b, 1c, 1d) that are potential threats to your water system.

1. Response to Vulnerability Assessment and Terrorists Threats
   a. Intentional contamination of the water supply (Figure 22.)
   b. Structural damage/physical attack to the water system
   c. Cyber attack on the SCADA system
   d. Release of hazardous chemicals

2. Natural Disasters
    a. Flood
    b. Tornado/Very High Winds
    c. Ice Storm/Heavy Snow
    d. Drought
    e. Waterborne Disease (e.g., Giardia or Cryptosporidium)
    f. Earthquake
3. Accidental Events
    a. Fire
    b. Electrical power outage (Figure 21.)
    c. Mechanical failure, e.g., major pump, line break
    d. Cross connection
    e. Chemical spill
    f. Radiation contamination from leak at nearby nuclear facility
4. Human-caused Events
    a. Bomb threat over phone (Figure 23.)
    b. Personnel problem
    c. Vandalism (e.g., broken locks on storage tank hatch)
    d. Suspicious mail

Develop a detailed response action plan for each type of emergency that the water system may encounter:
1. Assess the emergency, estimate the type and severity, and identify agencies and populations impacted (hospitals, nursing homes, police, fire dept., etc.).
2. Take immediate action as necessary to save lives and minimize injuries.
3. Take action to reduce damage to the water system.
4. Schedule repairs, water testing, and communications in a prioritized list.
5. Begin repairs, water testing and perform follow-up actions until the system is returned to normal operations.

The following Action Plans give examples of assessing an event, detailing response actions, defining communications and follow-up activities. After reviewing these examples, write an action plan for each emergency that you have determined to be a real threat to your water system. **Surface water systems with intakes on streams need to include an action plan addressing an upstream spill event.** Appendix B is a template that can be used for any action plan written for your water system. Do not restrict your action plans to those listed in Appendix C, (Outline of an EOP). Your EOP is not complete unless you address all potential threats to your water system.

Figure 21. Action Plan for a Power Outage.

Action Plan	
Emergency Type:	**Power Outage**
Assessment:	Middletown Water System experiences several short term power outages per year. A diesel generator at the water treatment plant can supply power to the water treatment plant and wells #6 and #7. Wells #1, #2, #3, #4, and #5 do not have back-up generators, but they are wired for portable generators. MWS owns one portable generator. Storage tanks can supply up to 24 hours of system water during average demand days. When the power goes out, the back-up diesel generator automatically starts operation. When the stored water level falls below 500,000 gallons, an alarm sounds and if no response is made within 5 minutes, an automatic call system calls a call list of water plant operator's home phone numbers.
Immediate Actions:	When the electric power goes out, call Tennessee Electric Company (TEC) and ask for estimated time for restoration of power. If the power may be out more than 12 hours, call Ace Rentals and reserve additional portable gas powered electric generators. If total water storage levels drops to 500,000 gallons, use portable generators to power wells 1 through 5 as required to provide water to plant. Monitor SCADA system for storage tank levels.
Communications:	Issue press release to local radio and TV stating that generators are being used to supply water and we ask that all customers conserve water until power is restored. Call TEC to inform them of decision to use back-up generators. Call diesel fuel and gasoline suppliers to confirm availability/delivery of fuel for refueling generators.
Follow-Up Actions:	Continue to monitor water storage levels, system operations, supply of diesel fuel and gasoline. Ask for continued water conservation until power is restored.
Return to Normal:	When power returns, call TEC to confirm power has been restored successfully. Remove generator power supply and return to TEC power. Issue press release to radio and TV that water usage may return to normal.

Figure 22. Action Plan for a Potential Contamination of the Water System.

Action Plan	
Emergency Type:	**Potential Contamination of Water System**
Assessment:	Middletown Water System performs a visual inspection of all booster pumps, storage tanks, lots, and hatches two times a week. Padlocks on the gate, valve vault hatch and tank access hatch are inspected. If the locks or hatches have been compromised to allow access to the water supply, implement the following procedures.
Immediate Actions:	1. Use caution and preserve a possible crime scene. Call supervisor and/or 911 for local police. Determine if it is safe to remain in the area. 2. Valve off the tank and/or distribution system to isolate any potential contamination. 3. Inspect the exterior and/or interior of the tank for any unusual objects, colors or odors. 4. Consult with TN Div. Of Water Supply, law enforcement, HAZMAT, labs and develop a water sampling plan (chlorine residual, pH, turbidity, conductivity, total organic carbon, total dissolved solids, etc.) 5. Continue treating water to supply customers in unaffected areas if possible.
Communications:	1. Call local police to report a break-in at a water tank. 2. Call TN Div. of Water Supply EAC office to report possible contamination of water supply. 3. Consult with DWS and police, call TN Dept. of Homeland Security if event is potentially a terrorist attack. 4. Prepare a statement for the media (TV/Radio/Newspaper) and issue “Do not Drink” or “Boil Water” Order if necessary. 5. Provide alternate water source if necessary.
Follow-Up Actions:	1. Monitor tank levels and system pressure. 2. Alert office staff to be on alert for customer water complaints. 3. If water tests indicate no contamination, cancel “Do not drink”. 4. If initial water tests indicate a probable contamination, consult with laboratory and state DWS to run specific tests as necessary to identify the contaminant. Run tests on distribution system to find extent of contamination. 5. Supply bottled water to customers in contaminated area. 6. Track cost of actions taken for possible government reimbursement.
Return to Normal:	1. Drain, clean, and refill tank and any other tanks or distribution lines. 2. Follow TN DWS Rules and AWWA procedures to restore service. 3. Issue statement to media that water is okay to drink.

Figure 23. Action Plan for a Bomb Threat.

Action Plan	
Emergency Type:	**Bomb Threat**
Assessment:	All threats to the water system should be taken seriously. Telephone threat messages may be left on the answering machine 24/7 or called in during normal office hours. "Threat Identification Checklists" are kept at each employee's desk.
Immediate Actions:	1. Record and/or document the phone call on a "Threat Identification Checklist". 2. Notify Manager or Emergency Response Coordinator (ERC). 3. ERC decides to call the police department. 4. ERC and police captain evaluate the threat to determine if it is credible. 5. The threat is credible, because of the recent termination of an employee. 6. Secure the water plant and perform an inspection of the three water tanks. 7. If anything suspicious is noted, wait for police before entering site.
Communications:	1. Call Manager or Emergency Response Coordinator. 2. Call Police Dept. 3. Report threat to Tennessee Division of Water Supply with information of threat and current status.
Follow-Up Actions:	1. Test water for potential contaminants (chlorine residual, pH and turbidity, etc.). 2. Assign a 24-hour guard at each water tank for 48 hours. 3. Ask the police department to provide additional patrols to the three water tanks for the next 48 hours. 4. Increase water dept. inspection of tanks to once per day. 5. Request police department to increase day and night shift patrols of the three water tanks. Reevaluate weekly. 6. Deliver evidence to police for criminal investigation. 7. Prepare a written public announcement for the news media.
Return to Normal:	1. The ERC decides when to return to routine tank inspections. 2. Police patrols to water tank and water plant return to normal frequency.

Glossary

Action Plans. An Emergency Operations Plan contains numerous action plans, each designed to be used during a specific type of threat or incident. Action plans should be easy to use and contain information, data, forms, or simple instructions. Action plans should support all personnel involved in an emergency management situation.

American Water Works Association (AWWA). AWWA is a non-profit, scientific and educational organization whose purpose is to promote public health, safety, and welfare through the improvement of the quality and quantity of water delivered to the public. AWWA has 43 sections in 7 regions in the U.S., Canada and Mexico.
www.awwa.org/

Association of State Drinking Water Administrators (ASDWA). ASDWA is the professional association serving state drinking water programs. ASDWA represents state drinking water administrators on all drinking water issues with Congress, the EPA, and other professional organizations. The ASDWA and the NRWA produced the document "Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000".
www.asdwa.org/

Bioterrorism Act. The Bioterrorism Act is the abbreviated name for Title IV of the Public Health Security and Bioterrorism Preparedness and Response Act, Public Law 107-188. The Bioterrorism Act is the public law that mandated Vulnerability Assessments and revisions to Emergency Response Plans for community water systems in order to improve the security of the nations water supply.
www.epa.gov/safewater/watersecurity/pubs/security_act.pdf

Boil Water Notice (BWN). A BWN is notification that advises customers to boil tap water used for drinking, cooking and ice making until tests can be run on potentially contaminated water. Water suppliers are required by the U.S. EPA to notify customers to boil water when water samples indicate contamination or when conditions exist that could potentially contaminate the water supply. These conditions include a drop in system pressure to below 20 pounds per square inch (psi), a break in a distribution line, a malfunction of the treatment system, or a cross-connection to a contaminated water supply.

Center for Disease Control and Prevention (CDC) The agency of the U.S. Department of Health and Human Services, located in Atlanta, Georgia, whose mission is to promote health and quality of life by preventing and controlling disease, injury, and disability. The CDC has information on emergency preparedness and response including the document "The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials (July 2001).
www.bt.cdc.gov/

Chain of Command. Individuals working an emergency observe the hierarchy of authority specified in an Emergency Response Plan (ERP) or Emergency Operations Plan (EOP). Names of all personnel and to whom they report should be clearly identified in a Chain of Command list.

Cross-connection Control (CCC). A Cross-connection Control program is the administrative plan and technical procedures the purveyor implements to protect the public water system from contamination via cross-connections as required by Tennessee Rule (1200-5-1-.17), section 6.
www.epa.gov/safewater/crossconnection.html

Division of Water Supply (DWS). DWS is the primacy agency for all Tennessee public water systems. DWS is responsible for national drinking water regulations, specifically those promulgated under the Safe Drinking Water Act as amended. DWS is a division of the Tennessee Department of Environment and Conservation.
www.tn.gov/environment/dws/

Department of Homeland Security (DHS). DHS is the department of the federal government of the United States concerned with protecting the American homeland and the safety of American citizens. DHS officially began operation on January 24, 2003. President Bush signed the Department of Homeland Security Bill on Nov. 25, 2002.
www.dhs.gov/dhspublic/

Emergency Operations Center (EOC). The EOC is a designated facility used to house the operations of an emergency response. Ideally, the EOC is a dedicated area equipped with communications equipment, reference materials, and other tools that facilitate a quick and appropriate emergency response. An alternate EOC should be designated in the event that the primary location is not usable.

Emergency Operations Plan (EOP). An Emergency Operations Plan is a documented plan that describes the resources available and the actions that a community water system would take in response to threats, an emergency, a natural disaster, or act of terrorism. The Terrorism Act of 2002 requires that all community water systems serving 3,300 or more people prepare or revise an ERP to incorporate the results of its Vulnerability Assessment (VA). The Environmental Protection Agency (EPA) refers to an EOP as an Emergency Response Plan (ERP).

Emergency Response Coordinator (ERC). The ERC is the lead person over an organization, utility or group during an emergency. In other states or organizations, the lead person may be called the Water Utility Emergency Response Manager (WUERM), Emergency Response Lead (ERL), or Emergency Operations Coordinator (EOC).

Emergency Response Plan (ERP). An ERP is a documented plan that describes the resources available and the actions that a community water system would take in response to threats, an emergency, a natural disaster, or act of terrorism. The Terrorism Act of 2002 requires that all community water systems serving 3,300 or more people prepare or revise an ERP to incorporate the results of its Vulnerability Assessment (VA). Tennessee DWS refers to an ERP as an Emergency Operations Plan (EOP).

Environmental Field Office (EFO). Tennessee Department of Environment and Conservation (TDEC) has seven field or regional offices that are called Environmental Field Offices. The offices are located in Memphis, Columbia, Nashville, Cookeville, Chattanooga, Knoxville, and Johnson City. Division of Water Supply maintains a staff at all EFO offices except Memphis. (Jackson DWS covers the Memphis region.)
www.tn.gov/environment/efo/

Environmental Protection Agency (EPA). The EPA is the independent federal agency with primary responsibility for protection of the natural environment, including air quality, water quality, wetlands, hazardous wastes, and other environmental matters.
www.epa.gov/

Federal Bureau of Investigation (FBI). A federal law enforcement agency that is the principal investigative arm of the Department of Justice.
www.fbi.gov/

Federal Emergency Management Agency (FEMA). FEMA is the independent agency of the United States government that handles all federal emergency preparedness, mitigation and response activities. FEMA responds to major emergencies that state and local agencies don't have the resources to handle.
www.fema.gov/

Freedom of Information Act (FOIA). Statute allowing the public access to certain information on file in government agencies.
www.usdoj.gov/oip/foiastat.htm

Hazardous Materials (HAZMAT). Hazardous materials are explosives, flammable/combustible substances, poisons, or radioactive materials. HAZMATs, if released, pose a threat to people and the environment. HAZMATs are classified by the U.S. EPA and the transport of HAZMATs is regulated by the U.S. Department of Transportation. Local HAZMAT response teams are required to take OSHA approved training in the handling of hazardous materials.
www.tnema.org/Word%20Docs/TEMA%20HAZARDOUS%20MATERIALS%20TRAINING%20COURSES.htm

Incident Command System (ICS). The ICS is a standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. TEMA offers training in ICS/EOC interface.
www.osha.gov/SLTC/etools/ics/index.html

Local Emergency Planning Committee (LEPC). LEPCs were established by the Emergency Planning and Community Right-to-Know Act (1986). LEPCs have the job of increasing community hazardous materials safety through public education, emergency planning, responder training, conducting exercises, and reviewing actual responses to releases. The water system should partner with the LEPC in the EOP planning stages. A list of Tennessee LEPCs/Emergency Management Agencies is at the following link:
www.yosemite.epa.gov/oswer/lepcdb.nst/HomePage?openForm

Material Safety Data Sheets (MSDS). MSDS documents (or digital files) on chemicals/hazardous materials provide physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill/leak procedures. The information in a MSDS is designed to provide workers and emergency personnel with the proper procedures for handling or working

with a particular substance. MSDS sheets are to be referenced in a chemical spill or accident.

Maximum Contaminant Level (MCL). Maximum permissible level of a contaminant in water that is delivered to any user of a public water system. MCL's are enforceable standards established by the U.S. Environmental Protection Agency.

Mutual Aid Agreement. A mutual aid agreement is a legal document outlining the details for the purchase or loaning of water, equipment, parts, chemicals, personnel, etc. from neighboring utilities in an emergency. Mutual aid agreements facilitate the immediate delivery of product and/or services when emergency strikes.

National Rural Water Association (NRWA). The NRWA is the non-profit federation of State Rural Water Associations. The NRWA provides the state associations (e.g. TAUD) with support services to meet the needs of their membership. The NRWA developed the "Security and Emergency Management System" (SEMS) Software Program which is based on the NRWA/ASDWA's "Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000".
www.nrwa.org/

National Safety Council (NSC). The NSC is a nonprofit organization chartered by Congress in 1913. It is made up of approximately 12,000 industry members nationwide. The purpose of the council is the dissemination of safety education material.
www.nsc.org/

Need-to-Know Basis. Information is considered to be available on a need-to-know basis when a determination is made by the possessor of classified information that a prospective recipient has a requirement for access to, knowledge of, or possession of the classified information in order to perform tasks or services essential to the fulfillment of a classified contract or program.

Occupational Safety and Health Administration (OSHA). OSHA is the federal agency within the U.S. Department of Labor that is responsible for setting standards to promote and enforce employee safety in the workplace.
www.osha.gov/

Personal Protective Equipment (PPE). Equipment and supplies designed to protect employees from serious injuries or illnesses resulting from contact with chemical, radiological, biological, or other hazards. PPE includes face shields, safety glasses, goggles, laboratory coats, gloves, and respirators.
www.osha.gov/SLTC/personalprotectiveequipment/index.html

Public Water System (PWS). A public water system is any water system, which provides water to at least 25 people for at least 60 days annually. There are more than 1,100 active public water systems in Tennessee. The standards for PWSs differ depending on their size and type of water system.

Response Protocol Toolbox (RPTB). The EPA's "*Response Protocol Toolbox: Planning for and Responding to Contamination Threats to Drinking Water Systems"* is designed to help the water sector effectively and appropriately respond to intentional

contamination threats and incidents. The Toolbox consists of 6 modules. The Toolbox modules are available on the EPA Water Security Publications website.

Risk Management Plan (RMP). Section 112(r) of the Federal Clean Air Act requires that facilities prepare and submit a Risk Management Plan (RMP) to the EPA if they pose great harm to the public and the environment in the event of an accidental chemical release. The RMP must describe the facility's chemical accident prevention program, emergency response program, and off-site consequence analysis (OCA).

Rules of Tennessee Department of Environment and Conservation Bureau of Environment Division of Water Supply, Chapter 1200-5-1, Public Water Systems. Guidelines for the interpretation of 68-221-701 et seq. of the Tennessee Code Annotated and to set out the procedures to be followed by the Department in carrying out the State's primary enforcement responsibility under the Federal Safe Drinking Water Act.
www.tn.gov/sos/rules/1200/1200-05/1200-05-01.pdf

Source Water Assessment Program (SWAP). Section 1453 of the 1996 Safe Drinking Water Act Amendments requires that all states establish a Source Water Assessment Program. The SWAP should include public water systems using surface water or ground water. The SWAPs should delineate source water protection areas, inventory significant contaminants to these areas, and determine the susceptibility of each public water supply to contamination.
www.tn.gov/environment/dws/dwassess.shtml

System Control and Data Acquisition (SCADA) System. SCADA systems generally consist of one or more computers, communications equipment, programmable logic controllers, sensors, and other devices that when linked together, automatically monitor and/or control the components of a water utility.

Spill Prevention Control and Countermeasures (SPCC) Plan. A specific type of emergency response plan required by federal regulations for facilities that store oil and oil-containing products and meet certain other conditions.
www.epa.gov/oilspill/spcc.htm

Tennessee Association of Utility Districts (TAUD). TAUD is the state affiliate association of the National Rural Water Association (NRWA). TAUD provides technical assistance and other services to utilities and businesses in the areas of water, wastewater, cross connection, natural gas, safety, legislation and more.
www.taud.org/

Tennessee Bureau of Investigation (TBI). Established in 1951, the TBI provides criminal and drug investigative services, forensic science, and crime information services to the Tennessee's criminal justice system.
www.tbi.state.tn.us/

Tennessee Emergency Management Agency (TEMA). TEMA is the state agency charged with the responsibility for insuring the state and its local governments are prepared to deal with the disasters and emergencies that affect the state and its citizens. TEMA is the lead agency in any major emergency or natural disaster.
www.tnema.org/

Tennessee Department of Homeland Security. State of Tennessee affiliate department of the U.S. Department of Homeland Security.
www.tn.gov/homelandsecurity/

Tennessee Department of Environment and Conservation. State of Tennessee executive branch department that protects the quality of Tennessee's air, land and water, and preserves, conserves, and promotes Tennessee's natural and cultural resources.
www.tn.gov/environment/

Tennessee Highway Patrol (THP). The Tennessee Highway Patrol (THP) is responsible for the enforcement of all federal and state laws relating to traffic. THP is responsible for investigating accidents involving property damage, personal injury, and fatalities. THP has district headquarters in Knoxville, Chattanooga, Nashville, Memphis, Fall Branch, Cookeville, Lawrenceburg and Jackson.
www.tn.gov/safety/thp.htm

Vulnerability Assessment (VA). A systematic process for evaluating the susceptibility of critical facilities to potential threats and identifying corrective actions that can reduce or mitigate the risk of serious consequences associated with these threats. The Terrorism Act of 2002 mandates that a VA be performed by all community water systems serving 3,300 or more people.

Water/Wastewater Agency Response Networks (WARN Networks). A WARN is a membership based network of systems who are wiling to provide assistance to any system within the network. WARNS are still designed to provide mutual aid during emergency or disaster situations, however they are coordinated to serve a much larger area. In most cases WARN networks are statewide networks. By creating these larger networks of mutual aid providers, water systems have access to resources when a large scale emergency affects several water systems in one area. California and Texas have WARN Networks.
www.calwarn.org or www.txwarn.org

Wellhead Protection Plan. Tennessee DWS Rule 1200-5-1-.34 establishes a statewide program for developing wellhead protection plans by public water systems. The plans shall safeguard public water supply wells by preventing contaminants from entering the area that contributes water to the well or wellfield. A management plan is developed for the wellhead protection area that includes inventorying potential sources of groundwater contamination, monitoring for the presence of specific contaminants, and managing existing and proposed land and water uses that may pose a threat to groundwater quality.
www.tn.gov/environmental/permits/wellhd.shtml

References and Links

American Water Works Association (AWWA): The AWWA produces many resources for water security issues (Vulnerability Assessments, Emergency Responses Plans and Risk Communication). EPA and AWWA have partnered to produce security training workshops. The book, *Emergency Planning for Water Utilities (Manual M19*) is available from the AWWA.
http://www.awwa.org

Association of State Drinking Water Administrators (ASDWA): ASDWA has information on water security planning, training, and links to state programs and other information sources.
http://www.asdwa.org

Bioterrorism Act: Federal law signed on June 12, 2002 by President Bush. The Act amends the Safe Drinking Water Act and specifies actions that community water systems and the EPA must take to improve the security of the nation's drinking water infrastructure. The act is H.R. 3448 "Public Health Security and Bioterrorism Preparedness and Response Act of 2002" Title IV-Drinking Water Security and Safety.
www.epa.gov/safewater/watersecurity/pubs/security_act.pdf

Center for Disease Control and Prevention (CDC): The CDC develops resources to assist hospital staff, clinics, and physicians in diagnosing diseases related to terrorism, reporting incidences of disease, and controlling the spread of infection. Two CDC documents available on the web are listed below:
http://www.bt.cdc.gov

> *The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials* (July 2001).
> http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.pdf
>
> *Interim Recommended Notification Procedures for Local and State Public Health Department Leaders in the Event of a Bioterrorist Incident*.
> http://www.bt.cdc.gov/emcontact/Protocols.asp

Department of Homeland Security (DHS): DHS is the federal agency for Homeland Security.
http://www.dhs.gov/index.shtm

> DHS administers the National Incident Management System (NIMS), which provides a nationwide template to enable federal, state, local, and tribal governments and private-sector organizations to work together to prepare for, prevent, respond to, and recover from domestic incidents, including terrorism.
> http://www.fema.gov/emergency/nims/index.shtmf

Drought Management Plans: Division of Water Supply (DWS) documents on drought management:

Guidance for Developing Community Water System Drought Management Plans, December 2009
http://www.tn.gov/environment/dws/droughtplanning/

Drought Management Plan (Revised February, 2010)
http://www.tn.gov/environment/dws/pdf/droughtmgtplan.pdf

Environmental Protection Agency (EPA): The EPA has produced many products on water infrastructure security, emergency response and water conservation:
http://www.epa.gov/safewater/security/index.html

A Water Security Handbook: Planning for and Responding to Drinking Water Contamination Threats and Incidents:
http://www.epa.gov/safewater/watersecurity/pubs/water_security_handbook_rptb.pdf

Emergency Response Plan Guidance for Small and Medium Community Water Systems to Comply with the Public health Security and Bioterrorism Preparedness and Response Act of 2002:
http://www.epa.gov/safewater/watersecurity/pubs/small_medium_ERP_guidance040704.pdf

Final Drinking Water Public Notification Regulations:
http://www.epa.gov/safewater/pws/pn/rulefact.html

Large Water System Emergency Response Plan Outline: Guidance to Assist Community Water Systems in the Complying with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002:
http://www.epa.gov/safewater/watersecurity/pubs/erp-long-outline.pdf

Local Emergency Planning Committees (LEPC):
www.yosemite.epa.gov/oswer/lepcdb.nst/HomePage?openForm

Public Notification Handbook (816-R-07-003, March 2007): This guide provides instructions and includes templates that water suppliers can use for various types of public notices.
http://www.epa.gov/ogwdw000/publicnotification/pdfs/guide_publicnotification_pnhandbook.pdf

Response Protocol Toolbox (RPTB):
http://cfpub.epa.gov/safewater/watersecurity/home.cfm?program_id=8#response_toolbox/

Response Protocol Toolbox: Planning for and responding to Drinking Water contamination Threats and incidents:
http://www.epa.gov/safewater/watersecurity/pubs/rptb_response_guidelines.pdf

Water Conservation Plan Guidelines:
http://www.epa.gov/watersense/pubs/guide.htm

Federal Emergency Management Agency (FEMA): On March 1, 2003, FEMA became part of the U.S. Department of Homeland Security. FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a risk-based, emergency management program of mitigation, preparedness, response and recovery.
http://www.fema.gov

Online training courses on emergency management are available from FEMA:
http://training.fema.gov/

Incident Command Structure (ICS) information may be found at:
http://training.fema.gov/EMIWeb/IS/ICSResource/index.htm

FEMA 426- Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings:
http://www.fema.gov/plan/prevent/rms/rmsp426

FEMA "Are You Ready? A Guide to Citizen Preparedness" Publication H-34 (Revised, September 2002):
http://www.fema.gov/areyouready/

National Drought Mitigation Center (NDMC): The NDMC helps people and institutions develop and implement measures to reduce societal vulnerability to drought, stressing preparedness and risk management rather than crisis management. Most of the NDMC's services are directed to state, federal, regional, and tribal governments that are involved in drought and water supply planning.
http://www.drought.unl.edu/index.htm

National Rural Water Association (NRWA): NRWA developed the "Security and Emergency Management System (SEMS) Software Program, which can be loaded on a personal computer. It is based on NRWA/ASDWA's "Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000."
http://www.nrwa.org

Occupational Safety & Health Administration (OSHA): OSHA's mission is to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.
http://www.osha.gov/index.html

OSHA Incident Command System/Unified Command (ICS/UC) is an efficient on-site tool to manage all emergency response incidents, and UC is a tool for managing multi-jurisdictional responses to oil spills or hazardous substance releases.
http://www.osha.gov/SLTC/etools/ics/index.html

Rules of Tennessee Department of Environment and Conservation, Bureau of Environment, Division of Water Supply, Chapter 1200-5-1, Public Water Supply:
http://www.tn.gov/sos/rules/1200/1200-05/1200-05-01.pdf

Tennessee Association of Utility Districts (TAUD): TAUD is the Tennessee affiliate of the National Rural Water Association (NRWA) and serves over 500 utilities and businesses in Tennessee. Staff members specializing in water and wastewater operations are available to provide technical, legal and operational support. TAUD produces a workbook for emergency planning that will assist water systems in preparing an EOP.
http://www.taud.org

> Emergency Planning Workbook for Tennessee's Water Utilities. Tennessee Association of Utility Districts (1989)

Tennessee Commercial Laboratories Approved for Drinking Water Analyses (Excluding Coliform and Turbidity). A list of commercial laboratories approved by the State of Tennessee for drinking water analysis:
http://www.tn.gov/environment/dws/pdf/dwa_labs.pdf

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Call 1-888-891-8332 OR 1-888-891-TDEC