

# **Security and Vulnerability Assessments**

**Tom O'Connor, PE  
H<sub>2</sub>O'C Engineering**

**H<sub>2</sub>O'C**

# **Security and Vulnerability Assessments**

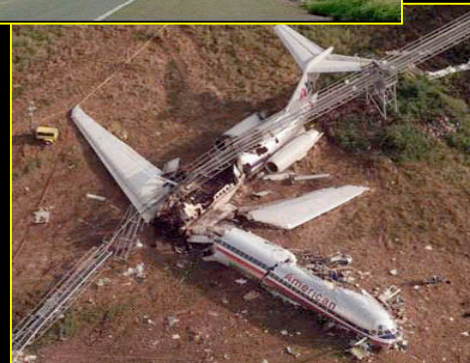
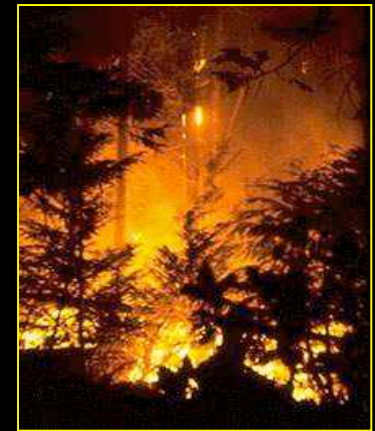
**WHAT** you need to do  
**WHEN** you need to do it  
**HOW** you can do it  
**WHO** can help  
**and WHY** does it need to be done?

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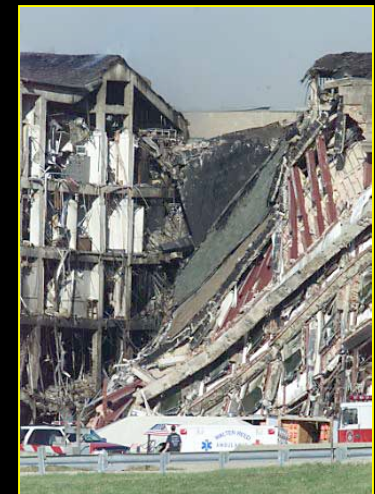
# The Old List

- Tech Disasters
- Snow Storms
- Civil Disturbances
- Tornadoes
- Floods
- Drought
- Fires





# The New List



# Potential Threats to Water Systems

## Biological and Chemical Contaminants

- released in source water, storage, treatment, or distribution systems

## Physical Destruction

- includes chemical storage

## Cyber Attack

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# Water System Security

- physical security
- electronic security
- policies and procedures
- security awareness and mindset

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# **The Tradeoff**

**Security**  
**vs.**  
**Convenience**

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# Public Health Security and Bioterrorism Preparedness and Response Act of 2002

## Requirements

This Act requires every CWS that serves a population > 3,300 persons to:

- 1. Conduct a vulnerability assessment**
- 2. Certify and submit a copy of the assessment to the EPA Administrator**
- 3. Prepare or revise an emergency response plan that incorporates the results of the vulnerability assessment; and**
- 4. Certify to the EPA Administrator, within 6 months of completing the vulnerability assessment, that the system has completed or updated their emergency response plan.**

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# Due Dates

**Systems serving  
population of:**

**Certify and submit  
Vulnerability  
Assessment (VA) by:**

**Certify Emergency  
Response Plan within  
6 months of VA but  
no later than:**

**100,000 or greater**

**March 31, 2003**

**September 30, 2003**

**50,000 - 99,999**

**December 31, 2003**

**June 30, 2004**

**3,301 - 49,999**

**June 30, 2004**

**December 31, 2004**

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**Instructions to Assist Community Water Systems  
in Complying with the  
Public Health Security and Bioterrorism  
Preparedness and Response Act of 2002**

Office of Water  
EPA 810-B-02-001  
January 2003

[www.epa.gov/safewater/security](http://www.epa.gov/safewater/security)



# **Bioterrorism Act**

**“The vulnerability assessment shall include, but not be limited to a review of:**

- 1. pipes and constructed conveyances,**
- 2. physical barriers,**
- 3. water collection, pretreatment, treatment, storage and distribution facilities,**
- 4. electronic, computer or other automated systems which are utilized by the public water system,**
- 5. the use, storage, or handling of various chemicals, and**
- 6. the operation and maintenance of such system.”**





# **Six Basic Elements of a Vulnerability Assessment**

- 1. Characterization of the water system, including its mission and objectives;**
- 2. Identification and prioritization of adverse consequences to avoid;**
- 3. Determination of critical assets that might be subject to malevolent acts that could result in undesired consequences;**
- 4. Assessment of the likelihood (qualitative probability) of such malevolent acts from adversaries (e.g., terrorists, vandals);**
- 5. Evaluation of existing countermeasures; and**
- 6. Analysis of current risk and development of a prioritized plan for risk reduction.**

# Resources

USEPA

MDNR

NESC

NDWC

NETC

ASDWA

NRWA, MRWA

AWWA

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# Resources

**USEPA: United States Environmental Protection Agency**

**MDNR: Missouri Department of Natural Resources**

**NESC: National Environmental Services Center**

**NDWC: National Drinking Water Clearinghouse**

**NETC: National Environmental Training Center**

**ASDWA: Assn. Of State Drinking Water Administrators**

**NRWA, MRWA: National/Missouri Rural Water Assn.**

**AWWA: American Water Works Association**



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@ National Drinking Water Clearinghouse

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Address: http://www.nesc.wvu.edu/ndwc/ndwc\_protect.htm go


National Environmental Services Center

NDWC National Drinking Water Clearinghouse

NETCSC NODP

NDWC National Small Flows Clearinghouse

NESC Home  
Subscribe  
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 National Drinking Water Clearinghouse

## Drinking Water Protection and Small Water System Security

The NDWC has assembled information about protecting small water systems against potential threats. Our intent is to educate governing boards and system personnel, help them prepare emergency plans, and find sources of more information.

The following collection of articles, checklists, phone numbers, and Web sites resulted from the concerted efforts of people from many organizations across the country.

We will add to the entries as we gather resources.  
*Choose a topic below to jump to the section.*


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 Protecting Small Water Systems  
What you should Know

Link: http://www.nesc.wvu.edu/nsfc/nsfc\_index.htm



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We will add to the entries as we gather resources.  
*Choose a topic below to jump to the section.*

[NDWC Co-sponsors Security Training](#) **NEW**  
[AWWA Publishes Drinking Water Security Report](#) **NEW**  
[American Metropolitan Water Agency's Security Resources](#)  
[Water System Security and Emergency Response Planning](#)  
[C-VAM Course for Community Safety](#)  
[Guide for Security Decision Making](#)  
[Water Information Sharing and Analysis Center](#)  
[National Governors Association Homeland Security](#)  
[Security Vulnerability Self-Assessment Guide for Small Systems](#)  
[Course on Planning/Response to Terrorism](#)  
[Interactive Emergency Planning Guide for Illinois Systems](#)  
[Guide for Emergency Planning EPA Fact Sheet](#)  
[EPA Water Protection Task Force Site](#)  
[Handbook for Water Supply Emergencies](#)  
[AWWA Security and Preparedness Resources](#)  
[Top Ten List for Small Ground Water Suppliers](#)  
[On-site Emergency Response Planning Guide](#)  
[Business and Legal Reports Offers Emergency Planning Suggestions](#)  
[CDC Bioterrorism Preparedness and Response](#)



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**Water Talk**  
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EPA - Water Infrastructure Security

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 **U.S. Environmental Protection Agency**

## Water Infrastructure Security

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Training

Vulnerability Assessment Tools

Emergency Response Tools

Technical Assistance

Financial Assistance

Information Sharing

Research

Links

### Overview

Under both the Safe Drinking Water Act (SDWA) and the Clean Water Act (CWA), EPA works closely with partner organizations -- other government agencies, and water utilities and associations (both drinking water and waste water) to ensure clean and safe water. Industry and government are also working cooperatively to improve drinking water and waste water security. Building on and supporting long-established relationships with our partners, EPA helps the water sector to: (1) understand and utilize the best scientific information and technologies for water security; (2) support assessment of utilities' vulnerabilities to possible attack; (3) take action to improve security; and (4) respond effectively and efficiently in the event that an incident occurs. This commitment is outlined in [EPA's Strategic Plan for Homeland Security](#).

A number of actions are underway, as described on these pages to:

- Support development of tools, training and technical assistance for small and medium drinking water, and wastewater utilities; and
- Promote information sharing, and research on water security.

### Public Health Security and Bioterrorism Preparedness and Response Act of 2002

Drinking water utilities today find themselves facing new responsibilities. While their mission has always been to deliver a dependable and safe supply of water to their customers, the challenges inherent in achieving that mission have expanded to include security and counter-terrorism. In the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Congress recognizes the need for drinking water systems to undertake a more comprehensive view of water safety and security. The Act amends the Safe Drinking Water Act and specifies actions community water systems and the U.S. Environmental Protection Agency (EPA) must take to improve the security of the nation's drinking water infrastructure.

To review copies of these laws:

[The Public Health Security and Bioterrorism Preparedness and Response Act \(see Title IV\)](#)

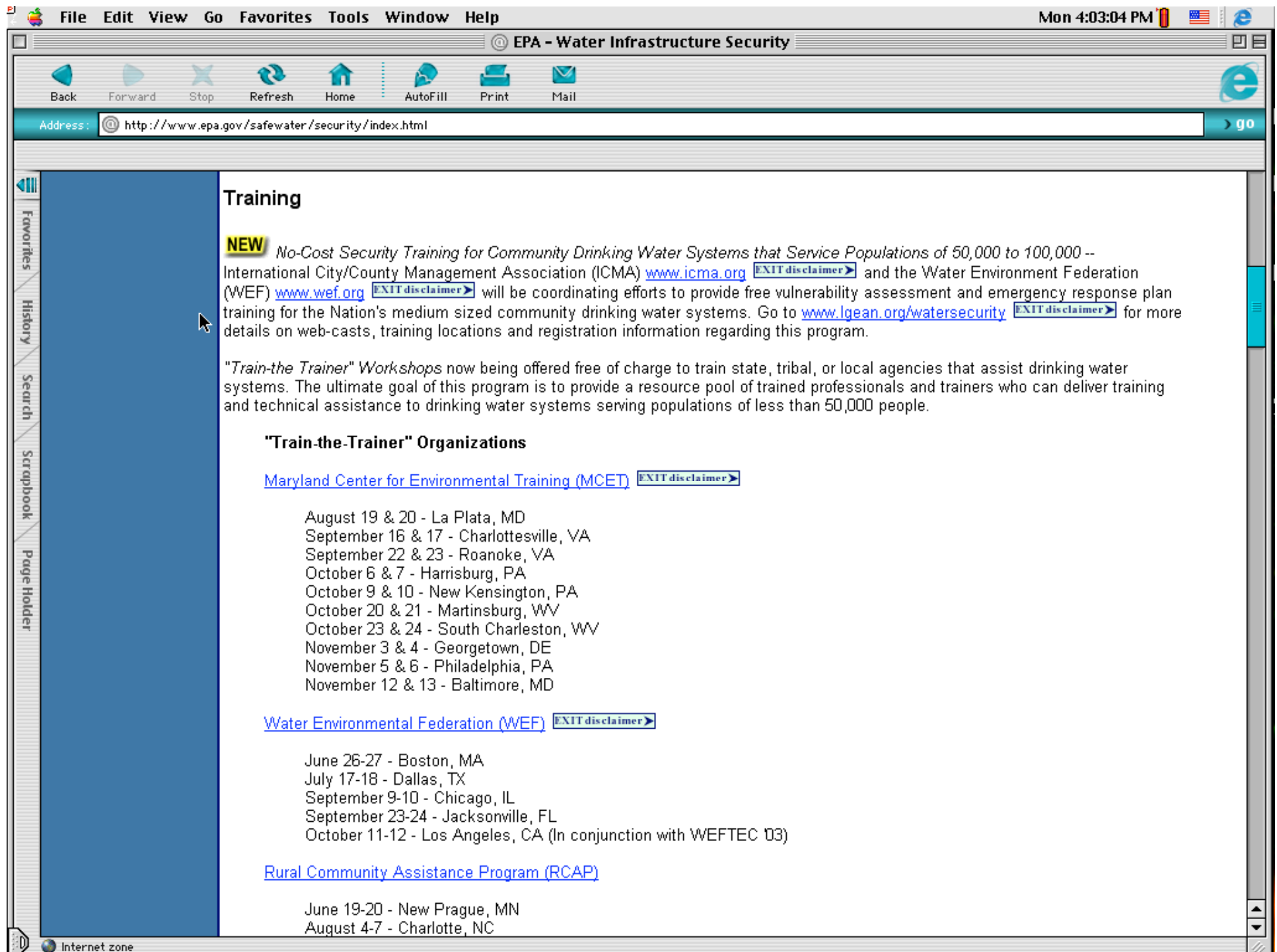
**What's New...**

[No-Cost Security Training for Community Drinking Water Systems that Service Populations of 50,000 to 100,000](#)

["Train-the-Trainer" for State and Local Agencies](#)

[Emergency Response Planning Workshops](#)

Link: http://www.epa.gov/



## Training

**NEW** *No-Cost Security Training for Community Drinking Water Systems that Service Populations of 50,000 to 100,000 --* International City/County Management Association (ICMA) [www.icma.org](http://www.icma.org) [EXIT disclaimer](#) and the Water Environment Federation (WEF) [www.wef.org](http://www.wef.org) [EXIT disclaimer](#) will be coordinating efforts to provide free vulnerability assessment and emergency response plan training for the Nation's medium sized community drinking water systems. Go to [www.lgean.org/watersecurity](http://www.lgean.org/watersecurity) [EXIT disclaimer](#) for more details on web-casts, training locations and registration information regarding this program.

"Train-the-Trainer" Workshops now being offered free of charge to train state, tribal, or local agencies that assist drinking water systems. The ultimate goal of this program is to provide a resource pool of trained professionals and trainers who can deliver training and technical assistance to drinking water systems serving populations of less than 50,000 people.

### "Train-the-Trainer" Organizations

[Maryland Center for Environmental Training \(MCET\)](#) [EXIT disclaimer](#)

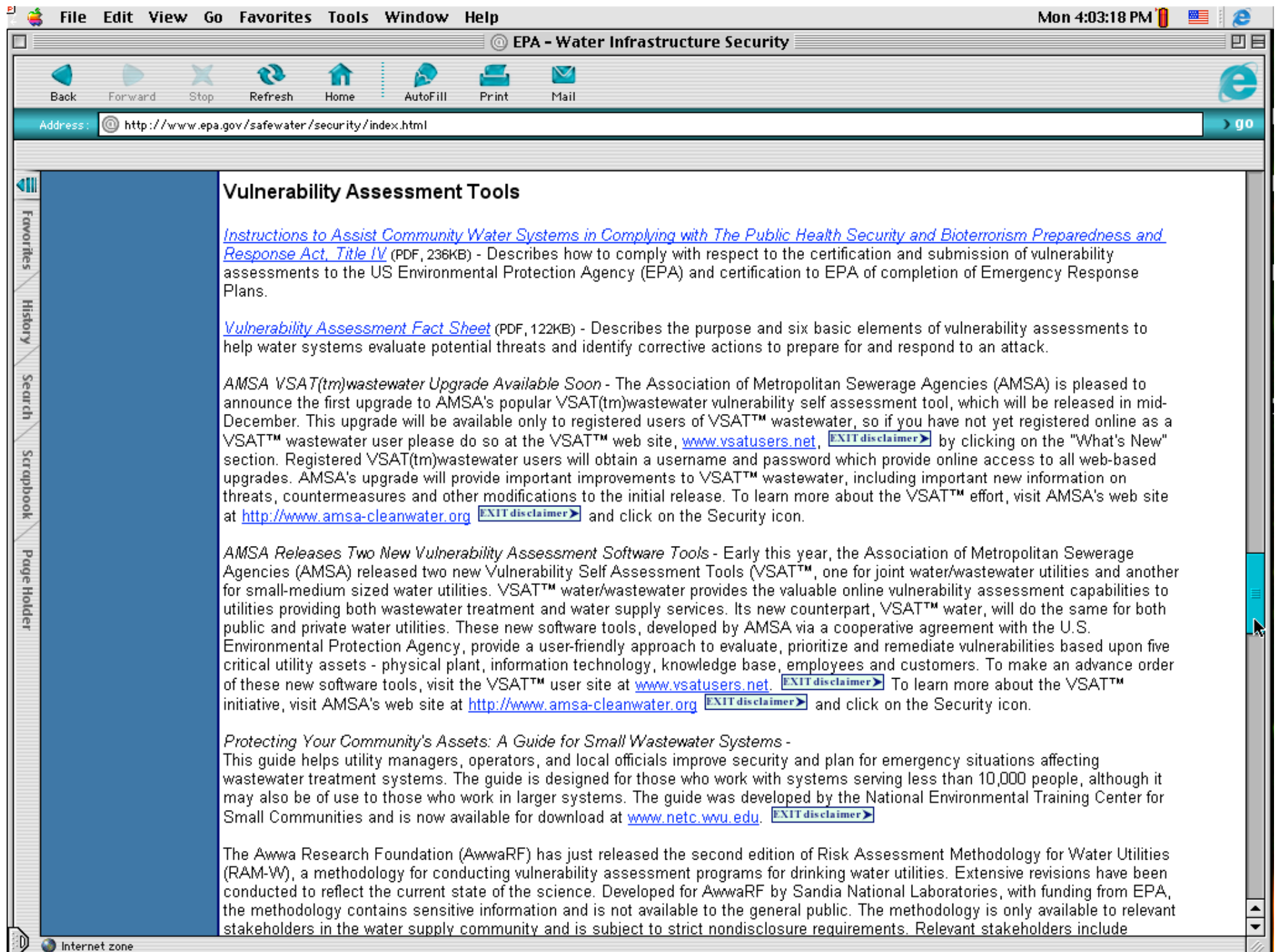
August 19 & 20 - La Plata, MD  
September 16 & 17 - Charlottesville, VA  
September 22 & 23 - Roanoke, VA  
October 6 & 7 - Harrisburg, PA  
October 9 & 10 - New Kensington, PA  
October 20 & 21 - Martinsburg, WV  
October 23 & 24 - South Charleston, WV  
November 3 & 4 - Georgetown, DE  
November 5 & 6 - Philadelphia, PA  
November 12 & 13 - Baltimore, MD

[Water Environmental Federation \(WEF\)](#) [EXIT disclaimer](#)

June 26-27 - Boston, MA  
July 17-18 - Dallas, TX  
September 9-10 - Chicago, IL  
September 23-24 - Jacksonville, FL  
October 11-12 - Los Angeles, CA (In conjunction with WEFTEC 03)

[Rural Community Assistance Program \(RCAP\)](#)

June 19-20 - New Prague, MN  
August 4-7 - Charlotte, NC



## Vulnerability Assessment Tools

[Instructions to Assist Community Water Systems in Complying with The Public Health Security and Bioterrorism Preparedness and Response Act, Title IV](#) (PDF, 236KB) - Describes how to comply with respect to the certification and submission of vulnerability assessments to the US Environmental Protection Agency (EPA) and certification to EPA of completion of Emergency Response Plans.

[Vulnerability Assessment Fact Sheet](#) (PDF, 122KB) - Describes the purpose and six basic elements of vulnerability assessments to help water systems evaluate potential threats and identify corrective actions to prepare for and respond to an attack.

**AMSA VSAT(tm)wastewater Upgrade Available Soon** - The Association of Metropolitan Sewerage Agencies (AMSA) is pleased to announce the first upgrade to AMSA's popular VSAT(tm)wastewater vulnerability self assessment tool, which will be released in mid-December. This upgrade will be available only to registered users of VSAT™ wastewater, so if you have not yet registered online as a VSAT™ wastewater user please do so at the VSAT™ web site, [www.vsatusers.net](http://www.vsatusers.net), [EXIT disclaimer](#) by clicking on the "What's New" section. Registered VSAT(tm)wastewater users will obtain a username and password which provide online access to all web-based upgrades. AMSA's upgrade will provide important improvements to VSAT™ wastewater, including important new information on threats, countermeasures and other modifications to the initial release. To learn more about the VSAT™ effort, visit AMSA's web site at <http://www.amsa-cleanwater.org> [EXIT disclaimer](#) and click on the Security icon.

**AMSA Releases Two New Vulnerability Assessment Software Tools** - Early this year, the Association of Metropolitan Sewerage Agencies (AMSA) released two new Vulnerability Self Assessment Tools (VSAT™, one for joint water/wastewater utilities and another for small-medium sized water utilities. VSAT™ water/wastewater provides the valuable online vulnerability assessment capabilities to utilities providing both wastewater treatment and water supply services. Its new counterpart, VSAT™ water, will do the same for both public and private water utilities. These new software tools, developed by AMSA via a cooperative agreement with the U.S. Environmental Protection Agency, provide a user-friendly approach to evaluate, prioritize and remediate vulnerabilities based upon five critical utility assets - physical plant, information technology, knowledge base, employees and customers. To make an advance order of these new software tools, visit the VSAT™ user site at [www.vsatusers.net](http://www.vsatusers.net), [EXIT disclaimer](#). To learn more about the VSAT™ initiative, visit AMSA's web site at <http://www.amsa-cleanwater.org> [EXIT disclaimer](#) and click on the Security icon.

### *Protecting Your Community's Assets: A Guide for Small Wastewater Systems -*

This guide helps utility managers, operators, and local officials improve security and plan for emergency situations affecting wastewater treatment systems. The guide is designed for those who work with systems serving less than 10,000 people, although it may also be of use to those who work in larger systems. The guide was developed by the National Environmental Training Center for Small Communities and is now available for download at [www.netc.wvu.edu](http://www.netc.wvu.edu), [EXIT disclaimer](#)

The Awwa Research Foundation (AwwaRF) has just released the second edition of Risk Assessment Methodology for Water Utilities (RAM-W), a methodology for conducting vulnerability assessment programs for drinking water utilities. Extensive revisions have been conducted to reflect the current state of the science. Developed for AwwaRF by Sandia National Laboratories, with funding from EPA, the methodology contains sensitive information and is not available to the general public. The methodology is only available to relevant stakeholders in the water supply community and is subject to strict nondisclosure requirements. Relevant stakeholders include



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EPA - Water Infrastructure Security

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## Emergency Response Tools

*Emergency Response Planning Workshops* -- EPA will sponsor a series of free one-day workshops throughout the nation. The federal "Bioterrorism Act" requires community water systems serving more than 100,000 people to update their Emergency Response Plans (and send certification of the update to EPA) by September 30, 2003. The Emergency Response Plan (ERP) update must address issues raised by the Vulnerability Assessments which the large water systems submitted to EPA prior to March 31, 2003. In light of the fast approaching deadline, EPA has asked the Office of Domestic Preparedness (Department of Homeland Security) to expand their current national training program on drinking water security and counter-terrorism to include this series of workshops. The one-day workshops will be offered throughout August and early September in 25-30 cities across the country. Dates and locations for these workshops will be provided within the next two weeks. Refer to this [fact sheet](#) for additional details.

[Model Emergency Response Guidelines](#) (PDF, 96K) - This document provides uniform response, recovery and remediation guidance for water utility actions in response to man-made and/or technological emergencies. The guidance was developed as an initiative of the Water Protection Task Force with input from water utilities and associations, EPA Regions, EPA Office of Water and other federal agencies. The intent of this guidance is to provide the minimum actions that EPA recommends be carried out by a water utility for the events described.

## Technical Assistance

**NEW** **Trained Security Assistance Providers for Wastewater Systems**

No-cost, on-site vulnerability assessment and emergency response plan assistance is available to small and medium wastewater utilities through the [Wastewater Operator Training Program](#), please contact your appropriate state environmental assistance provider for aid. These environmental assistance providers received specific training on the wastewater Vulnerability Self Assessment Tool (VSAT) software developed by the [Association of Metropolitan Sewerage Agencies](#). [EXIT disclaimer](#)

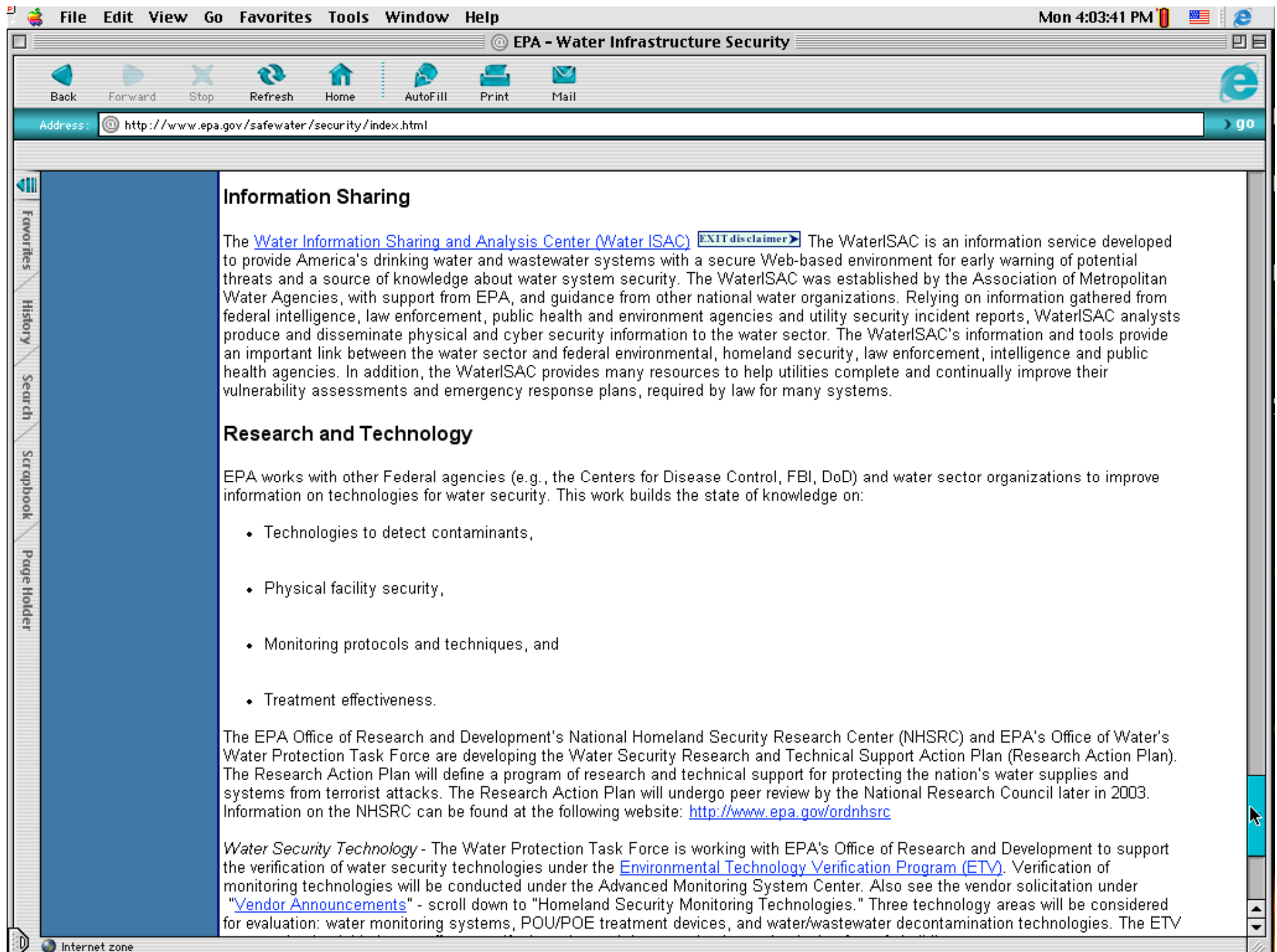
[Recognizing Waterborne Disease and the Health Effects of Water Pollution: A Physician On-Line Reference Guide](#) [EXIT disclaimer](#) -- With funding from EPA, this website was launched to help healthcare providers recognize and manage waterborne disease and the health effects of water pollution resulting from either natural or intentional contamination of water. Features of the web site include: 24/7 availability with free access; clinically relevant information detailing the diagnosis and management of waterborne disease, and; a repository of physician anti-terrorism preparedness resources.

EPA is working with the States, tribes, and utility organizations to determine the best ways to meet small and medium system needs. EPA will use a significant portion of the FY02 funds to provide training, development and distribution of tools, and technical assistance. The plan for assistance is outlined in the document, [Water Security Strategy for Systems Serving Populations Less than 100,000/15 MGD or Less](#). (PDF, 26KB)

## Financial Assistance

*Assistance to Large Drinking Water Systems* - In 2002, EPA provided \$51 million in grant assistance to 449 large (regularly serving

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## Information Sharing

The [Water Information Sharing and Analysis Center \(Water ISAC\)](#) [EXIT disclaimer](#) The WaterISAC is an information service developed to provide America's drinking water and wastewater systems with a secure Web-based environment for early warning of potential threats and a source of knowledge about water system security. The WaterISAC was established by the Association of Metropolitan Water Agencies, with support from EPA, and guidance from other national water organizations. Relying on information gathered from federal intelligence, law enforcement, public health and environment agencies and utility security incident reports, WaterISAC analysts produce and disseminate physical and cyber security information to the water sector. The WaterISAC's information and tools provide an important link between the water sector and federal environmental, homeland security, law enforcement, intelligence and public health agencies. In addition, the WaterISAC provides many resources to help utilities complete and continually improve their vulnerability assessments and emergency response plans, required by law for many systems.

## Research and Technology

EPA works with other Federal agencies (e.g., the Centers for Disease Control, FBI, DoD) and water sector organizations to improve information on technologies for water security. This work builds the state of knowledge on:

- Technologies to detect contaminants,
- Physical facility security,
- Monitoring protocols and techniques, and
- Treatment effectiveness.

The EPA Office of Research and Development's National Homeland Security Research Center (NHSRC) and EPA's Office of Water's Water Protection Task Force are developing the Water Security Research and Technical Support Action Plan (Research Action Plan). The Research Action Plan will define a program of research and technical support for protecting the nation's water supplies and systems from terrorist attacks. The Research Action Plan will undergo peer review by the National Research Council later in 2003. Information on the NHSRC can be found at the following website: <http://www.epa.gov/ordnhsrsc>

*Water Security Technology* - The Water Protection Task Force is working with EPA's Office of Research and Development to support the verification of water security technologies under the [Environmental Technology Verification Program \(ETV\)](#). Verification of monitoring technologies will be conducted under the Advanced Monitoring System Center. Also see the vendor solicitation under "[Vendor Announcements](#)" - scroll down to "Homeland Security Monitoring Technologies." Three technology areas will be considered for evaluation: water monitoring systems, POU/POE treatment devices, and water/wastewater decontamination technologies. The ETV

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**Order Form**  
**VSAT™water**  
(This form has been tested with Internet Explorer 6.0, Netscape 7.0, Mozilla 1.3)

Fill out and submit this online form to order a VSAT™ water CD  
\* denotes a required field

Name:  \*  
Title:  \*  
Public/Private Agency:  \*  
Address:   
City:  \* State:  \* Zip:  \*  
Phone:  \*  
Fax:   
E-Mail:  \*

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(November 2002)

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# VSAT

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## Vulnerability Self-Assessment Tools

**Software (developed by AMSA with USEPA money) to evaluate, prioritize and remediate vulnerabilities based upon five critical utility assets:**

- physical plant
- information technology
- knowledge base
- employees
- customers

**CONTACT US**

Name:  \*

Title:  \*

Agency:  \*

Address:

City:  State:  Zip:  \*

Phone:  \*

Fax:

E-Mail:  \*

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# **The Big Two Resources**

- 1. Security Vulnerability Self-Assessment  
Guide for Small Drinking Water Systems  
(NRWA, ASDWA)**
- 2. PWS Model Emergency Operating Plan  
(MDNR-PDWP)**

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# **Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems**

**Association of State Drinking Water  
Administrators**

**National Rural Water Association**

**May 30, 2002**

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Model Emergency Operating Plan for Public Wat...


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## Model Emergency Operating Plan for Public Water Supplies

As of June 6, 2003

 Note: The pdf files can be viewed and printed.  
The download files can be customized for your water supply needs.

 If you do not have Adobe Acrobat Reader, download and install the reader by clicking the "Get Reader" button. This is needed to view or print the PDF and Fill-in PDF formatted publications on this Web site.

### Available PDF Files:

- [Introduction](#)  (06/06/03) 22K PDF
- [Who Does What?](#)  (06/06/03) 37K PDF
- [Groundwater](#)  (06/06/03) 24K PDF
- [Surfacewater](#)  (06/06/03) 22K PDF
- [Water Plant](#)  (06/06/03) 24K PDF
- [Distribution](#)  (06/06/03) 21K PDF
- [Security Threat](#)  (06/06/03) 34K PDF
- [Damage Assessment Forms](#)  (06/06/03) 30K PDF
- [Emergency Forms](#)  (06/06/03) 23K PDF

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Model Emergency Operating Plan for Public Wat...

# Emergency Operating Plan

## AWWA's Nine Step Program Model Emergency Operating Plan for Public Water Supplies

As of June 6, 2003

1. **Gather command group at a designated location**
2. **Conduct preliminary assessment to determine nature, extent, and severity of the disturbance**
3. **Assemble specialized groups**
4. **Alert other officials**
5. **Media communication**
6. **Human health consideration**
7. **Determine alternative sources for emergency water supply**
8. **Establish relationships with nearby water utilities and supporting utilities**
9. **Plan and implement countermeasures and recovery measures**

Note: The pictures can be viewed and printed.  
The download files can be customized for your water supply needs.

If you do not have Adobe Acrobat Reader, download and install the reader by clicking the "Get Reader" link.

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[Water Plant](#) New (06/06/03) 24K PDF  
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# **Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems**

**Association of State Drinking Water  
Administrators**

**National Rural Water Association**

**May 30, 2002**



# Security Vulnerability Self-Assessment for Small Water Systems

## General Questions for the Entire Water System

*The first 13 questions in this vulnerability self-assessment are general questions designed to apply to all components of your system (wellhead or surface water intake, treatment plant, storage tank(s), pumps, distribution system, and offices). These are followed by more specific questions that look at individual system components in greater detail.*

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
1. Do you have a written emergency response plan (ERP)?	Yes • No •	<p>It is essential that you have an ERP. If you do not have an ERP, you can obtain a sample from your state drinking water primacy agency. As a first step in developing your ERP, you should develop your Emergency Contact List (see Attachment 2).</p> <p>A plan is vital in case there is an incident that requires immediate response. Your plan should be reviewed at least annually (or more frequently if necessary) to ensure it is up-to-date and addresses security emergencies.</p> <p>You should designate someone to be contacted in case of emergency regardless of the day of the week or time of day. This contact information should be kept up-to-date and made available to all water system personnel and local officials (if applicable).</p> <p>Share this ERP with police, emergency personnel, and your state primacy agency. Posting contact information is a good idea only if authorized personnel are the only ones seeing the information. These signs could pose a security risk if posted for public viewing since it gives people information that could be used against the system.</p>	
2. Is access to the critical components of the water system (i.e., a part of the physical infrastructure of the system that is essential for water flow and/or water quality) restricted to authorized personnel only?	Yes • No •	<p>You should restrict or limit access to the critical components of your water system to authorized personnel only. This is the first step in security enhancement for your water system. Consider the following:</p> <ul style="list-style-type: none"> <li>• Issue water system photo identification cards for employees, and require them to be displayed within the restricted area at all times.</li> <li>• Post signs restricting entry to authorized personnel and ensure that assigned staff escort people without proper ID.</li> </ul>	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
3. Are facilities fenced, including wellhouses and pump pits, and are gates locked where appropriate?	Yes • No •	<p>Ideally, all facilities should have a security fence around the perimeter.</p> <p>The fence perimeter should be walked periodically to check for breaches and maintenance needs. All gates should be locked with chains and a tamper-proof padlock that at a minimum protects the shank. Other barriers such as concrete "jersey" barriers should be considered to guard certain critical components from accidental or intentional vehicle intrusion.</p>	
4. Are your doors, windows, and other points of entry such as tank and roof hatches and vents kept closed and locked?	Yes • No •	<p>Lock all building doors and windows, hatches and vents, gates, and other points of entry to prevent access by unauthorized personnel. Check locks regularly. Dead bolt locks and lock guards provide a high level of security for the cost.</p> <p>A daily check of critical system components enhances security and ensures that an unauthorized entry has not taken place.</p> <p>Doors and hinges to critical facilities should be constructed of heavy-duty reinforced material. Hinges on all outside doors should be located on the inside.</p> <p>To limit access to water systems, all windows should be locked and reinforced with wire mesh or iron bars, and bolted on the inside. Systems should ensure that this type of security meets with the requirements of any fire codes. Alarms can also be installed on windows, doors, and other points of entry.</p>	
5. Is there external lighting around the critical components of your water system?	Yes • No •	Adequate lighting of the exterior of water systems' critical components is a good deterrent to unauthorized access and may result in the detection or deterrence of trespassers. Motion detectors that activate switches that turn lights on or trigger alarms also enhance security.	
6. Are warning signs (tampering, unauthorized access, etc.) posted on all critical components of your water system? (For example, well houses and storage tanks.)	Yes • No •	<p>Warning signs are an effective means to deter unauthorized access.</p> <p>"Warning - Tampering with this facility is a federal offense" should be posted on all water facilities. These are available from your state rural water association.</p> <p>"Authorized Personnel Only," "Unauthorized Access Prohibited," and "Employees Only" are examples of other signs that may be useful.</p>	
7. Do you patrol and inspect your source intake, buildings, storage tanks, equipment, and other critical components?	Yes • No •	<p>Frequent and random patrolling of the water system by utility staff may discourage potential tampering. It may also help identify problems that may have arisen since the previous patrol.</p> <p>Consider asking your local law enforcement agencies to conduct patrols of your water system. Advise them of your critical components and explain why they are important.</p>	



QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
8. Is the area around the critical components of your water system free of objects that may be used for breaking and entering?	Yes • No •	When assessing the area around your water system's critical components, look for objects that could be used to gain entry (e.g., large rocks, cement blocks, pieces of wood, ladders, valve keys, and other tools).	
9. Are the entry points to your water system easily seen?	Yes • No •	<p>You should clear fence lines of all vegetation. Overhanging or nearby trees may also provide easy access. Avoid landscaping that will permit trespassers to hide or conduct unnoticed suspicious activities.</p> <p>Trim trees and shrubs to enhance the visibility of your water system's critical components.</p> <p>If possible, park vehicles and equipment in places where they do not block the view of your water system's critical components.</p>	
10. Do you have an alarm system that will detect unauthorized entry or attempted entry at critical components?	Yes • No •	<p>Consider installing an alarm system that notifies the proper authorities or your water system's designated contact for emergencies when there has been a breach of security. Inexpensive systems are available. An alarm system should be considered whenever possible for tanks, pump houses, and treatment facilities.</p> <p>You should also have an audible alarm at the site as a deterrent and to notify neighbors of a potential threat.</p>	
11. Do you have a key control and accountability policy?	Yes • No •	<p>Keep a record of locks and associated keys, and to whom the keys have been assigned. This record will facilitate lock replacement and key management (e.g., after employee turnover or loss of keys). Vehicle and building keys should be kept in a lockbox when not in use.</p> <p>You should have all keys stamped (engraved) "DO NOT DUPLICATE."</p>	
12. Are entry codes and keys limited to water system personnel only?	Yes • No •	Suppliers and personnel from co-located organizations (e.g., organizations using your facility for telecommunications) should be denied access to codes and/or keys. Codes should be changed frequently if possible. Entry into any building should always be under the direct control of water system personnel.	
13. Do you have a neighborhood watch program for your water system?	Yes • No •	Watchful neighbors can be very helpful to a security program. Make sure they know whom to call in the event of an emergency or suspicious activity.	

## Water Sources

*In addition to the above general checklist for your entire water system (questions 1-13), you should give special attention to the following issues, presented in separate tables, related to various water system components. Your water sources (surface water intakes or wells) should be secured. Surface water supplies present the greatest challenge. Typically they encompass large land areas. Where areas cannot be secured, steps should be taken to initiate or increase law enforcement patrols. Pay particular attention to surface water intakes. Ask the public to be vigilant and report suspicious activity.*

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
14. Are your wellheads sealed properly?	Yes • No •	A properly sealed wellhead decreases the opportunity for the introduction of contaminants. If you are not sure whether your wellhead is properly sealed, contact your well drilling/maintenance company, your state drinking water primacy agency, your state rural water association, or other technical assistance providers.	
15. Are well vents and caps screened and securely attached?	Yes • No •	Properly installed vents and caps can help prevent the introduction of a contaminant into the water supply.  Ensure that vents and caps serve their purpose, and cannot be easily breached or removed.	
16. Are observation/test and abandoned wells properly secured to prevent tampering?	Yes • No •	All observation/test and abandoned wells should be properly capped or secured to prevent the introduction of contaminants into the aquifer or water supply. Abandoned wells should be either removed or filled with concrete.	
17. Is your surface water source secured with fences or gates? Do water system personnel visit the source?	Yes • No •	Surface water supplies present the greatest challenge to secure. Often, they encompass large land areas. Where areas cannot be secured, steps should be taken to initiate or increase patrols by water utility personnel and law enforcement agents.	

## Treatment Plant and Suppliers

*Some small systems provide easy access to their water system for suppliers of equipment, chemicals, and other materials for the convenience of both parties. This practice should be discontinued.*

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
18. Are deliveries of chemicals and other supplies made in the presence of water system personnel?	Yes • No •	Establish a policy that an authorized person, designated by the water system, must accompany all deliveries. Verify the credentials of all drivers. This prevents unauthorized personnel from having access to the water system.	
19. Have you discussed with your supplier(s) procedures to ensure the security of their products?	Yes • No •	Verify that your suppliers take precautions to ensure that their products are not contaminated. Chain of custody procedures for delivery of chemicals should be reviewed. You should inspect chemicals and other supplies at the time of delivery to verify they are sealed and in unopened containers. Match all delivered goods with purchase orders to ensure that they were, in fact, ordered by your water system.  You should keep a log or journal of deliveries. It should include the driver's name (taken from the driver's photo I.D.), date, time, material delivered, and the supplier's name.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
20. Are chemicals, particularly those that are potentially hazardous or flammable, properly stored in a secure area?	Yes • No •	<p>All chemicals should be stored in an area designated for their storage only, and the area should be secure and access to the area restricted. Access to chemical storage should be available only to authorized employees.</p> <p>You should have tools and equipment on site (such as a fire extinguisher, drysweep, etc.) to take immediate actions when responding to an emergency.</p>	
21. Do you monitor raw and treated water so that you can detect changes in water quality?	Yes • No •	<p>Monitoring of raw and treated water can establish a baseline that may allow you to know if there has been a contamination incident.</p> <p>Some parameters for raw water include pH, turbidity, total and fecal coliform, total organic carbon, specific conductivity, ultraviolet adsorption, color, and odor.</p> <p>Routine parameters for finished water and distribution systems include free and total chlorine residual, heterotrophic plate count (HPC), total and fecal coliform, pH, specific conductivity, color, taste, odor, and system pressure.</p> <p>Chlorine demand patterns can help you identify potential problems with your water. A sudden change in demand may be a good indicator of contamination in your system.</p> <p>For those systems that use chlorine, absence of a chlorine residual may indicate possible contamination. Chlorine residuals provide protection against bacterial and viral contamination that may enter the water supply.</p>	
22. Are tank ladders, access hatches, and entry points secured?	Yes • No •	<p>The use of tamper-proof padlocks at entry points (hatches, vents, and ladder enclosures) will reduce the potential for unauthorized entry.</p> <p>If you have towers, consider putting physical barriers on the legs to prevent unauthorized climbing.</p>	
23. Are vents and overflow pipes properly protected with screens and/or grates?	Yes • No •	Air vents and overflow pipes are direct conduits to the finished water in storage facilities. Secure all vents and overflow pipes with heavy-duty screens and/or grates.	
24. Can you isolate the storage tank from the rest of the system?	Yes • No •	<p>A water system should be able to take its storage tank(s) out of operation or drain its storage tank(s) if there is a contamination problem or structural damage.</p> <p>Install shut-off or bypass valves to allow you to isolate the storage tank in the case of a contamination problem or structural damage.</p> <p>Consider installing a sampling tap on the storage tank outlet to test water in the tank for possible contamination.</p>	

## **Distribution**

*Hydrants are highly visible and convenient entry points into the distribution system. Maintaining and monitoring positive pressure in your system is important to provide fire protection and prevent introduction of contaminants.*

<b>QUESTION</b>	<b>ANSWER</b>	<b>COMMENT</b>	<b>ACTION NEEDED/TAKEN</b>
25. Do you control the use of hydrants and valves?	Yes • No •	Your water system should have a policy that regulates the authorized use of hydrants for purposes other than fire protection. Require authorization and backflow devices if a hydrant is used for any purpose other than fire fighting.  Consider designating specific hydrants for use as filling station(s) with proper backflow prevention (e.g., to meet the needs of construction firms). Then, notify local law enforcement officials and the public that these are the only sites designated for this use.  Flush hydrants should be kept locked to prevent contaminants from being introduced into the distribution system, and to prevent improper use.	
26. Does your system monitor for, and maintain, positive pressure?	Yes • No •	Positive pressure is essential for fire fighting and for preventing backsiphonage that may contaminate finished water in the distribution system. Refer to your state primacy agency for minimum drinking water pressure requirements.	
27. Has your system implemented a backflow prevention program?	Yes • No •	In addition to maintaining positive pressure, backflow prevention programs provide an added margin of safety by helping to prevent the intentional introduction of contaminants. If you need information on backflow prevention programs, contact your state drinking water primacy agency.	

## **Personnel**

*You should add security procedures to your personnel policies.*

<b>QUESTION</b>	<b>ANSWER</b>	<b>COMMENT</b>	<b>ACTION NEEDED/TAKEN</b>
28. When hiring personnel, do you request that local police perform a criminal background check, and do you verify employment eligibility (as required by the Immigration and Naturalization Service, Form I-9)?	Yes • No •	It is good practice to have all job candidates fill out an employment application. You should verify professional references. Background checks conducted during the hiring process may prevent potential employee-related security issues.  If you use contract personnel, check on the personnel practices of all providers to ensure that their hiring practices are consistent with good security practices.	



QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
29. Are your personnel issued photo-identification cards?	Yes • No •	For positive identification, all personnel should be issued water system photo-identification cards and be required to display them at all times.  Photo identification will also facilitate identification of authorized water system personnel in the event of an emergency.	
30. When terminating employment, do you require employees to turn in photo IDs, keys, access codes, and other security-related items?	Yes • No •	Former or disgruntled employees have knowledge about the operation of your water system, and could have both the intent and physical capability to harm your system. Requiring employees who will no longer be working at your water system to turn in their IDs, keys, and access codes helps limit these types of security breaches.	
31. Do you use uniforms and vehicles with your water system name prominently displayed?	Yes • No •	Requiring personnel to wear uniforms, and requiring that all vehicles prominently display the water system name, helps inform the public when water system staff is working on the system. Any observed activity by personnel without uniforms should be regarded as suspicious. The public should be encouraged to report suspicious activity to law enforcement authorities.	
32. Have water system personnel been advised to report security vulnerability concerns and to report suspicious activity?	Yes • No •	Your personnel should be trained and knowledgeable about security issues at your facility, what to look for, and how to report any suspicious events or activity.  Periodic meetings of authorized personnel should be held to discuss security issues.	
33. Do your personnel have a checklist to use for threats or suspicious calls or to report suspicious activity?	Yes • No •	To properly document suspicious or threatening phone calls or reports of suspicious activity, a simple checklist can be used to record and report all pertinent information. Calls should be reported immediately to appropriate law enforcement officials. Checklists should be available at every telephone. Sample checklists are included in Attachment 3.  Also consider installing caller ID on your telephone system to keep a record of incoming calls.	

### **Information storage/computers/controls/maps**

*Security of the system, including computerized controls like a Supervisory Control and Data Acquisition (SCADA) system, goes beyond the physical aspects of operation. It also includes records and critical information that could be used by someone planning to disrupt or contaminate your water system.*

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
34. Is computer access "password protected?" Is virus protection installed and software upgraded regularly and are your virus definitions updated at least daily? Do you have Internet firewall software installed on your computer? Do you have a plan to back up your computers?	Yes • No •	All computer access should be password protected. Passwords should be changed every 90 days and (as needed) following employee turnover. When possible, each individual should have a unique password that they do not share with others. If you have Internet access, a firewall protection program should be installed on your computer.  Also consider contacting a virus protection company and subscribing to a virus update program to protect your records.  Backing up computers regularly will help prevent the loss of data in the event that your computer is damaged or breaks. Backup copies of computer data should be made routinely and stored at a secure off-site location.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
35. Is there information on the Web that can be used to disrupt your system or contaminate your water?	Yes • No •	<p>Posting detailed information about your water system on a Web site may make the system more vulnerable to attack. Web sites should be examined to determine whether they contain critical information that should be removed.</p> <p>You should do a Web search (using a search engine such as Google, Yahoo!, or Lycos) using key words related to your water supply to find any published data on the Web that is easily accessible by someone who may want to damage your water supply.</p>	
36. Are maps, records, and other information stored in a secure location?	Yes • No •	<p>Records, maps, and other information should be stored in a secure location when not in use. Access should be limited to authorized personnel only.</p> <p>You should make back-up copies of all data and sensitive documents. These should be stored in a secure off-site location on a regular basis.</p>	
37. Are copies of records, maps, and other sensitive information labeled confidential, and are all copies controlled and returned to the water system?	Yes • No •	Sensitive documents (e.g., schematics, maps, and plans and specifications) distributed for construction projects or other uses should be recorded and recovered after use. You should discuss measures to safeguard your documents with bidders for new projects.	
38. Are vehicles locked and secured at all times?	Yes • No •	<p>Vehicles are essential to any water system. They typically contain maps and other information about the operation of the water system. Water system personnel should exercise caution to ensure that this information is secure.</p> <p>Water system vehicles should be locked when they are not in use or left unattended.</p> <p>Remove any critical information about the system before parking vehicles for the night.</p> <p>Vehicles also usually contain tools (e.g., valve wrenches) that could be used to access critical components of your water system. These tools should be secured and accounted for daily.</p>	

### **Public Relations**

*You should educate your customers about your system. You should encourage them to be alert and to report any suspicious activity to law enforcement authorities.*

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
39. Do you have a program to educate and encourage the public to be vigilant and report suspicious activity to assist in the security protection of your water system?	Yes • No •	<p>Advise your customers and the public that your system has increased preventive security measures to protect the water supply from vandalism. Ask for their help. Provide customers with your telephone number and the telephone number of the local law enforcement authority so that they can report suspicious activities. The telephone number can be made available through direct mail, billing inserts, notices on community bulletin boards, flyers, and consumer confidence reports.</p>	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
40. Does your water system have a procedure to deal with public information requests, and to restrict distribution of sensitive information?	Yes • No •	<p>You should have a procedure for personnel to follow when you receive an inquiry about the water system or its operation from the press, customers, or the general public.</p> <p>Your personnel should be advised not to speak to the media on behalf of the water system. Only one person should be designated as the spokesperson for the water system. Only that person should respond to media inquiries. You should establish a process for responding to inquiries from your customers and the general public.</p>	
41. Do you have a procedure in place to receive notification of a suspected outbreak of a disease immediately after discovery by local health agencies?	Yes • No •	<p>It is critical to be able to receive information about suspected problems with the water at any time and respond to them quickly. Procedures should be developed in advance with your state drinking water primacy agency, local health agencies, and your local emergency planning committee.</p>	
42. Do you have a procedure in place to advise the community of contamination immediately after discovery?	Yes • No •	<p>As soon as possible after a disease outbreak, you should notify testing personnel and your laboratory of the incident. In outbreaks caused by microbial contaminants, it is critical to discover the type of contaminant and its method of transport (water, food, etc.). Active testing of your water supply will enable your laboratory, working in conjunction with public health officials, to determine if there are any unique (and possibly lethal) disease organisms in your water supply.</p> <p>It is critical to be able to get the word out to your customers as soon as possible after discovering a health hazard in your water supply. In addition to your responsibility to protect public health, you must also comply with the requirements of the Public Notification Rule. Some simple methods include announcements via radio or television, door-to-door notification, a phone tree, and posting notices in public places. The announcement should include accepted uses for the water and advice on where to obtain safe drinking water. Call large facilities that have large populations of people who might be particularly threatened by the outbreak: hospitals, nursing homes, the school district, jails, large public buildings, and large companies. Enlist the support of local emergency response personnel to assist in the effort.</p>	
43. Do you have a procedure in place to respond immediately to a customer complaint about a new taste, odor, color, or other physical change (oily, filmy, burns on contact with skin)?	Yes • No •	<p>It is critical to be able to respond to and quickly identify potential water quality problems reported by customers. Procedures should be developed in advance to investigate and identify the cause of the problem, as well as to alert local health agencies, your state drinking water primacy agency, and your local emergency planning committee if you discover a problem.</p>	

***Now that you have completed the "Security Vulnerability Self-Assessment Guide for Small Water Systems," review your needed actions and then prioritize them based on the most likely threats. A Table to assist you in prioritizing actions is provided in Attachment 1.***

## Certification of Completion

A final step in completing the "Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems" is to notify the state drinking water primacy agency that the assessment has been conducted. Please fill in the following information and send this page only to the appropriate state drinking water primacy agency contact so that this certification can be included in the records that the state maintains on your water system.

**Public Water**  
**System (PWS) ID:** \_\_\_\_\_

**System Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Town/City:** \_\_\_\_\_ **State:** \_\_\_\_\_

**ZIP Code:** \_\_\_\_\_

**Phone:** \_\_\_\_\_ **Fax:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Person Name:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Town/City:** \_\_\_\_\_ **State:** \_\_\_\_\_

**ZIP Code:** \_\_\_\_\_

**Phone:** \_\_\_\_\_ **Fax:** \_\_\_\_\_

**Email:** \_\_\_\_\_

I certify that the information in this vulnerability assessment has been completed to the best of my knowledge and that the appropriate parties have been notified of the assessment and recommended steps to be taken to enhance the security of the water system. Furthermore, a copy of the completed assessment will be retained at the public water system, in a secure location, for state review as requested.

**Signed** \_\_\_\_\_ **Date** \_\_\_\_\_

Please send this page only to the attention of the State Drinking Water Primacy Agency.

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