HOMELAND SECURITY AND DRINKING WATER

An Opportunity for Comprehensive Protection of a Vital Natural Resource

October 2003

HOMELAND SECURITY AND DRINKING WATER:

An Opportunity for Comprehensive Protection of a Vital Natural Resource

Homeland Security and Drinking Water:
An Opportunity for Comprehensive Protection of a Vital Natural Resource

ISBN# 1-58576-070-6, ELI project code 981626

An electronic retrievable copy (PDF file) of this report may be obtained for no cost from the Environmental Law Institute website <www.elistore.org>.
[Note: ELI Terms of Use will apply and are available on site.]

ACKNOWLEDGMENTS

This report was prepared by the Environmental Law Institute (ELI) with funding from the U.S. Environmental Protection Agency (EPA) under Assistance Agreement ID No. CR CR-82677501-F. The views expressed herein should not be attributed to EPA, nor should any official endorsement be inferred. The authors of this report are: B.Suzi Ruhl, Vivian Buckingham and Erica Pencak. The authors would like to thank Jay Austin, Senior Attorney, for his outstanding guidance, editing, and comments. They would also like to thank Wendy Sandoz for her editorial and layout expertise. ELI also gratefully acknowledges the help of the following reviewers of select sections: Bart Bibler, P.E., Florida Department of Health; Van Hoofnagle, P.E., Florida Department of Environmental Protection; and, Philip P. Wieczynski, P.E., Florida Department of Environmental Protection.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Safe drinking water is a vital resource for human health and is crucial to our everyday life. We all depend on clean, healthy water for nourishment, hygiene, and the basic comforts of our existence. Yet, our nation's drinking water has proven vulnerable to contamination from intentional, natural, and accidental acts. These threats are even more apparent after the tragic events of September 11, 2001, which ushered in fundamental changes to our society and system of governance.

As a result, there are ongoing measures being taken by all levels of government, the private sector, academia, and public interest organizations that are intended both to respond to potential acts of terrorism and to prevent such acts. These measures provide the opportunity to maximize protection of the nation's population, natural resources, and drinking water from both terrorist and conventional threats. The challenge is to devise a system of governance and practice that can respond to homeland security needs while at the same time addressing related conventional needs, thereby achieving dual purposes in an era of increasingly limited government resources.

To meet this challenge, it is necessary to increase understanding and awareness of how homeland security activities and policies can affect drinking water, both directly and indirectly. This increased understanding must occur at all levels and branches of government, and include those who are involved in the delivery of drinking water to consumers across the nation, the diverse stakeholders who seek to protect this invaluable resource, and the public at large.

Even prior to September 11th, the federal government had taken significant action to strengthen its ability to prevent and respond to acts of terrorism, including those with the potential to affect drinking water. Activities since that day include legislation, executive orders, and presidential decision directives. Congress responded immediately to protect drinking water through amendments to the Safe Drinking Water Act, as part of the Public Health Security and Bioterrorism Preparedness and Response Act, P.L. 107-188, which addresses vulnerability assessments and emergency response plans. The federal government also has responded through policies, programs, financial assistance and other actions.

Additional authorities to address homeland security and drinking water safety are found in existing federal environmental laws administered by the U.S. Environmental Protection Agency. These laws may apply to the act of terrorism itself, to site-specific actions taken in response to a terrorist event, to government programs or projects developed as a systemic response to homeland security needs, and to specific biological, chemical or radioactive agents that may become weaponized for terrorist actions.

State and local governments also have joined the efforts to protect homeland security through a variety of measures, including revised laws, new policies, and both new and reinvented programs. At least 43 states have taken some form of legislative action. This legislation has been adopted in areas that include water supply protection, public health measures, emergency preparedness, and appropriation of funds, as well as administrative, enforcement and criminal mechanisms to ensure homeland security.

In addition, states and municipalities have taken other forms of action to assist water suppliers, local governments, first responders, the health sector, and the general public. These include, for example:

* **Preparation of educational and guidance materials**—The Arizona Department of Environmental Quality has produced a Drinking Water Emergency Operations Plan Checklist that addresses the steps a water system should take to assure continuation of service under a variety of emergency situations, up to and including loss of the water supply. The Checklist covers provisions for alternative water sources; notification procedures; disinfection and testing procedures; inventory of spare parts; and emergency response training for operational staff.

* **Creation of task forces** — The State of Ohio Security Task Force convened representatives of first responders and their state organizations, emergency management agencies, and public health agencies, and produced guidelines designed to assist local officials in dealing with threatened biological terrorism incidents. Disposal of infectious wastes or contaminated items, including runoff, was raised as a factor to consider in determining impact on drinking water, as was the impact of the incident on the safety of public drinking water.

* **Engagement of local government** — The Governor of South Dakota sent a letter to the mayors of the state, urging them to assess vulnerabilities and implement measures to improve water supply security, communication with law enforcement, and monitoring of raw water quality. The letter also listed the various ways in which a drinking water system could be disrupted or damaged (e.g., contamination of the raw water source or reservoirs with chemical or biological agents; physical damage to water storage structures, intake structures, treatment plant; loss of power to the treatment plant or computer malfunction; damage to the distribution system; and the pumping or siphoning of chemical or biological agents into the distribution system from a private home or other access point).

* **Utility action** — In the District of Columbia, the Washington Aqueduct has developed multiple methods of controlling access to Aqueduct facilities through controls on physical access, chemical storage, and operational systems in order to safeguard the water. The Aqueduct also has prepared emergency response plans.

* **Stakeholder communication and coordination** — The Minnesota Department of Health addresses drinking water protection from terrorists and ordinary vandals through coordination with local law enforcement, local emergency managers, personnel training, public notification planning, and by linking with the Health Alert Network, among other measures.

The interest and capacity of state governments to take action to address homeland security and drinking water safety can be illustrated in-depth by the State of Florida, which has a large number of people who rely on public water supply systems for safe drinking water.

Florida also is considered a high-alert area for terrorist actions, and has mustered a swift response to the events of September 11th, through executive orders, appropriations, and legislation. Multiple state agencies are involved in drinking water security, including the Department of Law Enforcement, Department of Community Affairs, Department of Environmental Protection, and Department of Health. Of particular interest is Florida's Emergency Rule, now adopted into the Permitting Rule of the Florida Administrative Code, which requires notification of the State Warning Point immediately once a public water supply system owner or operator becomes aware of a suspicious incident, security breach, or act of sabotage at or against their water system.

Beyond the efforts of government to ensure drinking water security, and to maximize protection of drinking water from terrorist, natural, and accidental contamination, it is necessary to identify opportunities for constructive interaction among diverse stakeholders. These include, but are not limited to, drinking water utilities, emergency personnel, the legal, technical, and health sectors, academic institutions, non-governmental organizations, and the general public. Based on interviews with representatives from these sectors, several issues ripe for collaboration emerged. These include:

(1) Linking Water Infrastructure with Drinking Water Security;
(2) Engaging the Public in Drinking Water Security;
(3) Building Bridges between Public Health and Drinking Water Safety;
(4) Technological Advances as a Catalyst for Improving Drinking Water Safety; and,
(5) Water Security Lessons from Emergency Planning and Management.

Ultimately, drinking water security demands consideration of all challenges to the water supply, both conventional and terrorist-related. In a period of shrinking budgets, it is imperative that measures that address both kinds of challenges be identified and pursued when appropriate. Investment in the infrastructure of drinking water in this manner will be an investment in the future of the nation's communities.

INTRODUCTION

The tragic events of September 11, 2001 ushered in fundamental changes to our society and system of governance. These changes include both responsive and proactive measures designed to protect the people of the United States from acts of terrorism. Within the evolving paradigm of "homeland security," there is an urgent opportunity to maximize protection of the nation's population and natural resources from acts of terrorism, through both new homeland security authorities and existing environmental laws. At the same time, there exists an important opportunity to enhance environmental protection through homeland security measures. The challenge will be to devise a system of governance that succeeds in securing our country's environment and health from intentional, natural, and accidental acts that result in environmental degradation and adverse health effects. Achieving these dual purposes will also ensure maximum use of increasingly limited government resources.

Safe drinking water is a vital resource that is not immune to terrorist acts. Prior to September 11th, the importance of water was recognized in Presidential Decision Directive 63, "Protecting America's Critical Infrastructures." Signed by President Clinton in 1998, this directive identified water as one of eight critical infrastructures that, if subject to attack, would significantly harm the health and economic well-being of America's communities. The water infrastructure includes both drinking water supply and wastewater containment and treatment.

Since September 11th, the potential vulnerability of drinking water to acts of terrorism has only grown in importance. In June 2002, President Bush signed into law the Public Health Security and Bioterrorism Preparedness and Response Act, (P.L. 107-188). This new law, an amendment to the federal Safe Drinking Water Act, mandates utilities to conduct formal assessments of the potential vulnerabilities of their drinking water systems to terrorism.

The consequences of terrorism for drinking water can take many forms. These include:

- *Actual contamination.* During World War II, a Japanese Army biological warfare unit released cholera into the water supply of a Chinese town. Because the unit did not inform its own soldiers, 18,000 Japanese died.
- *Psychological fears.* In the summer of 2002, it was reported that on the same day for three years in a row, someone injected naphthalene into the distribution system serving a county courthouse in central Florida. While actual physical harm was negligible, the psychological effects of this calculated act raised concerns with the loss of public confidence in the safety of the water supply.
- *Unnecessary loss of valuable supplies.* In the summer of 2002, local officials in a Wisconsin town discovered that intruders had breached security at one of the town's two drinking water reservoirs. In an effort to prevent harm to human health, they drained the entire tank, losing five million gallons of what turned out to be uncontaminated water.
- *Opposition to security measures.* In early 2003, protestors in Oregon opposed plans to bury two large reservoirs and cap two less-exposed reservoirs intended to thwart terrorists. They questioned the vulnerability of the reservoirs to intentional poisoning and pollution.

These examples reflect the vital and growing importance of proactive water security programs that can integrate efforts by all levels of government, the private sector, and the public.

Yet the roles of each of these sectors in homeland security, and the balance between them, are still evolving. While all levels of government have increased their legal authorities, policies, and programs intended to address acts of terrorism, the private sector and the public are still in need of information that will facilitate their own constructive contributions to homeland security. This report seeks to foster such a broad understanding, and to illustrate a multidimensional approach toward homeland and environmental security by focusing on the issue of drinking water security.

PURPOSE AND SCOPE OF THIS REPORT

The purpose of this report is to increase stakeholders' understanding and awareness of homeland security activities and policies that affect drinking water at all levels of government. The report first addresses the legal authorities and programs afforded by new homeland security

laws, policies, and programs at the federal level. It also identifies existing provisions within federal environmental laws that may be interpreted to apply to homeland security issues, such as the release of a biological or chemical agent into drinking water.

Since states also play a significant role in addressing drinking water security through federally-delegated authority and state laws, the report identifies examples of state-level issues and legislative and programmatic action that, to date, have been taken by states. Finally, the report offers some concrete opportunities for protecting drinking water from terrorist actions through innovative collaborations between all levels of government, responders to terrorist acts, utilities, public health professionals, and the public at large.

This report is written for the public. It presents both government authorities and examples of implementation measures—not as a mandate from above, but as an evolving process that includes the public's vital role in strengthening America's drinking water security. The public's role can range from direct involvement in decisions and measures designed to prevent terrorist actions against drinking water, to financial and political support for the implementation of these measures.

RESEARCH METHODOLOGY

ELI's research approach initially cast a wide net to capture the essence of a broad range of activities underway at all levels of government. The goal of the research was twofold: (1) to allow people with experience in the drinking water field to identify other authorities and programs that would illustrate how water security can be strengthened; and (2) to help people outside the drinking water field, but who are involved in activities that affect drinking water security, to understand the emerging legal authorities and programs that will protect our drinking water from terrorist events. This approach was informed through ELI's preliminary meetings with professionals with extensive experience in drinking water protection and emergency management and operations.

Thus, in carrying out the research for this report, ELI first identified several sources of federal legal authority. These included statutes adopted specifically to address homeland security and protection of the drinking water supply; other homeland security statutes that may also relate to drinking water protection; and additional federal executive-branch authorities, such as Presidential Decision Directives, Executive Orders, and agency policies. ELI also identified federal programs that have been implemented to address drinking water security. Finally, ELI identified and analyzed provisions of federal environmental laws, implemented by EPA, that may potentially be interpreted to apply to terrorist events. Provisions relating to the release of weaponized biological and chemical agents that may adversely affect drinking water and human health were examined in the greatest depth, due to their high potential to provide tools for the prevention and remediation of contamination.

ELI next identified and analyzed statutory authorities adopted at the state level in response to the events of September 11th. ELI selected state legislation that specifically addressed drinking water protection, terrorism, and security protection—the categories most often used to frame legislative responses to terrorist events. After completing a general review of all 50 states in order to identify and profile the various types of legislative actions being undertaken, ELI's research focused on developments that took place after September 11th. From these, ELI selected for illustrative purposes examples that specifically addressed terrorism or the relationship between terrorism and drinking water, or that were identified in recent reports from the Office of Homeland Security[1] and the Center for Law and Public Health.[2]

While the general survey of state legislation provided a "snapshot" of the rapidly changing homeland security landscape, the time and resources allotted for this study did not permit ELI to exhaustively examine the laws of each state, nor to thoroughly analyze every state law that was identified. Instead, the goal of the study is to highlight examples of existing opportunities for promoting interaction among potential stakeholders in matters that directly or indirectly affect drinking water. As a result, only state legislative action on bioterrorism as it relates to drinking water is listed in the report, not all state action relating to bioterrorism. Further, ELI identified provisions that addressed conventional drinking water issues as part of a larger effort to respond to terrorism; state legislation solely on conventional drinking water issues is not included in this report.

Last, ELI identified active programs and projects underway at the state and local levels that were uncovered through a broad search of current drinking water protection, homeland security, drinking water security, and bioterrorism laws and activities. Again, no attempt was made to compile a comprehensive list of these programs and projects; rather, examples have been chosen to illustrate the various types of activities that are being pursued.

In particular, ELI chose to focus on the state of Florida as a case study, and conducted a thorough analysis of representative drinking water security activities in that state. Florida was selected for the case study for a variety of reasons: it already is considered a high alert area for terrorist actions; it has a large number of military bases; it has already experienced the physical and psychological effects of terror through the recent anthrax episode, which

started in Florida; it has a large population of both residents and tourists that relies on public water supply systems for safe drinking water; and has mustered a swift response to the events of September 11th through executive order and legislation.

For this section, we conducted multiple interviews with representatives from 11 different sectors and subject-matter areas. The majority of the interviewees selected were from Florida, as part of the focus on the Florida case study and as a result of limited travel resources. Additional interviewees from other locations were selected based on their representation of specific sectors and subject matter, particularly where they had expertise and experience that was not available in Florida. Given the substantive scope of the study, all interviewees were selected for their experience with drinking water protection and their potential to provide innovative strategies for collaboration on drinking water security.

In selecting interviewees, ELI sought individuals to represent the following kinds of experience and background:

- small public water system in need of financial and technical assistance for drinking water security
- local government official from a town with a small public water supply system
- large public water supply system engaged in community involvement
- state environmental agency, including both its drinking water program and emergency operations sections
- state health department, including the environmental epidemiology division, bureau of water programs, and the public health preparedness office
- state community affairs agency, including the emergency management division
- water advocate
- grassroots advocate
- faith-based advocate
- faculty at a school of public health active in homeland security measures
- countries that have experienced serious terrorist events and adopted innovative approaches toward drinking water security

These individuals were deemed to represent an appropriate and balanced cross-section of subject matter, such as state government, public water supply, public health, and emergency response; and of sectoral interests, including citizen and non-governmental perspectives in addition to governmental ones.

From these interviews, ELI identified opportunities that illustrate and offer the potential to promote constructive interaction, such as water infrastructure improvement, public engagement in drinking water security, addressing public health and waterborne diseases, technology advancements for homeland security, and emergency response planning, among other issues. ELI evaluated each of these potential opportunities according to its relationship to drinking water protection, challenges to protection of drinking water from terrorist acts, and progress toward achieving drinking water security. The evaluation was designed in order to identify mutual goals and objectives, related functions and interests, shared challenges, and opportunities for synergy.

STRUCTURE OF THIS REPORT

This report is divided into six sections. The first section discusses the relevance of homeland security to drinking water protection and provides a framework for understanding the potential vulnerabilities of drinking water to terrorist actions. The second section provides a review of federal homeland security authorities that address drinking water, including legislation, Presidential Decision Directives, Executive Orders, and agency policies and programs. The third section highlights federal environmental laws that may apply to terrorist actions, based on interpretations of statutes that are administered by U.S. EPA. The fourth section provides highlights of state authorities and programs addressing drinking water security. The fifth section provides a case study of Florida. The final section explores opportunities for constructive interaction with the public to enhance drinking water security.

CHAPTER 1
RELATIONSHIP BETWEEN DRINKING WATER AND HOMELAND SECURITY[3]

It has long been recognized that among public utilities, water supply facilities offer a particularly vulnerable point of attack to the foreign agent, due to the strategic position they occupy in keeping the wheels of industry turning and in preserving the health and morale of the American populace.

J. Edgar Hoover, Director of the FBI, shortly before the Japanese invasion of Pearl Harbor[4]

The American public recognizes the vulnerability of water utilities as a potential target for terrorism. According to a poll conducted by the National League of Cities in 2002, a large percentage of American cities identified water supply as the top priority among facilities that need to be secured in a city.

The public's concerns about threats to drinking water are grounded in fact. There are estimates of 50-100 incidents of vandalism and other acts that are carried out annually against U.S. drinking water and wastewater systems.[5] There have been documented examples of incidents carried out against drinking water systems by disgruntled employees, religious cults, and wartime battles. In addition, since the events of September 11, 2001, there have been numerous threats, warnings, and security alerts against U.S. water systems.[6]

Drinking water systems are at risk from terrorism for several reasons. First, since water is ingested, there is the potential for serious health effects and casualties. Second, drinking water is a basic component of life. Even if bottled water is available, tap water must be used for cooking, bathing, washing dishes, etc. Third, loss of confidence in the overall safety of U.S. drinking water could cause a major disruption in everyday life for the entire population, not just those directly affected. Fourth, municipal water is essential for public safety—for example, the loss of ability to store or pump water can interfere with fire protection. Fifth, public water availability is important to industry and our economy; factories, food processors, restaurants, and other businesses, need a safe water supply.[7]

To maintain drinking water security, three fundamental functions of the critical infrastructure for water delivery must be addressed. First, there must be adequate quantities of water on demand. Second, the water must be delivered at sufficient pressure. Third, it must be safe for use. Actions that affect any of these three components can debilitate the water infrastructure and result in adverse impacts on water supply. Even short-term disruptions in water supply and service—through loss of water or substantial loss of pressure—can severely impact daily living, cause stress, discomfort and illness, and undermine public confidence in the government's ability to protect its citizens.

TYPES OF ATTACK

The water sector is susceptible to a variety of types of attacks. The most serious are:

(1) *Physical destruction of facilities.* This type of attack can be achieved through the use of guns, explosives, and arson. It can involve disruption or destruction of an operating or distribution system component, a power source or other interdependent infrastructure, such as telecommunications; water treatment chemical containers (e.g., chlorine); supervisory control and data acquisition (SCADA) systems; and raw water reservoirs, aqueducts, and pumping stations. The impact of physical destruction on water supplies can also adversely affect related homeland security functions, including that of firefighting capabilities in instances of a loss of flow and pressure. Finally, chemicals used in the treatment process (e.g., chlorine) are themselves susceptible to terrorist attack. Possible concerns are the release of chlorine gas into a residential neighborhood, and the interruption of the supply of chemicals to the treatment plant needed for disinfection.

(2) *Cyber-attacks.* This type of attack can affect the entire water infrastructure network. These types of attack include the introduction of a computer virus, assumption of control of the treatment or distribution systems, destruction of data handling capabilities, destruction of stored data, and hacking. These attacks could result in disclosure or theft of sensitive information, corruption of information, or denial of service.[8]

(3) *Biological agents added to a water supply.* Weapons of mass destruction include biological agents, such as viruses, bacteria, fungi, or toxins from living organisms. Relevant characteristics of an agent's potential as a biological weapon include its stability in the drinking water system, virulence, culturability in the quan-

tity required, and resistance to detection and identification processes.[9]

(4) *Chemical agents added to a water supply.* There are at least six categories of chemical weapons, which include nerve agents, vesicants or blister agents, cyanides, pulmonary/choking agents, irritants, and toxic industrial chemicals. Because chemical warfare agents such as nerve, choking, and blister agents have been developed for delivery through an airborne route, they are not considered as likely toxic water contamination threats. This is due to the high concentrations required for toxicity through ingestion as compared to inhalation, and their low stability in water. Further, many toxic chemicals have disagreeable colors, tastes, and odors that render them easily detectable.

(5) *Radioactive materials added to a water supply.* The use of radioactive materials to contaminate drinking water supplies would require a significant level of radionuclides to cause acute health risks, even though chronic effects associated with lower dosages remain a concern. It is believed that since many radioactive materials are insoluble in water, heavy, and would settle out prior to reaching the intended target, the risk is not high.The primary radiological threat is the use of conventional explosives to spread radioactive contamination over an area, which could include incidental contamination of water supplies.

(6) *Release of hazardous treatment chemicals to the environment.* Given that most water systems use chemicals to treat for microbial contamination, terrorists could cause an intentional release of stored chemicals that may pose a risk to neighboring communities. For example, larger systems use gaseous chlorine as a disinfectant, while others use ammonia. Often these materials are stored in one-ton cylinders or 55- or 90-ton railway tank cars. The level of security for these containers is a factor for their potential use in an terrorist event.[10]

POINTS OF VULNERABILITY

Uninterrupted provision of safe drinking water is an absolute public health necessity. Loss of the ability for utilities to guarantee this critical infrastructure would result in a major disruption of life for the American population. Points of vulnerability can be assessed from several areas.

A major point of vulnerability involves the individual components of the water supply system. Potential terrorist actions include damaging or destroying the water supply infrastructure, such as treatment plants, intakes, pumps, tanks, distribution systems, and pipeline networks. They also include contamination of the raw source water and finished or treated water in tanks or storage reservoirs or distribution systems and pipeline networks with chemical or biological agents.[11]

The nature of the risk to each of these system components varies. It is commonly believed that the risk of successful introduction of a toxic chemical or microbiological agent at the source or treatment plant is relatively low. This is due to the dilution factor, and the multiple barrier approach used to detect and eliminate or deter naturally occurring pathogens. A conventional treatment process involves coagulation and sedimentation, filtration, and disinfection. However, introduction of biological agents may be more of a threat in ground water systems because these systems typically employ less treatment than surface systems. Further, there are few opportunities for finding unobserved sites for sabotage at larger public water supply systems, however, these opportunities may be more prevalent at reservoirs.[12]

Greater concern is now being expressed about the intentional contamination of drinking water through the distribution system. This can be achieved by direct injection into service lines or by pumping against the pressure gradient in home service connections. The distribution system is more vulnerable because of its unguarded accessibility and widespread area of use. Further, contaminants introduced directly into the distribution system would avoid removal by processes at the treatment plant. In addition, contaminants introduced into the distribution system are less susceptible to dilution and would reside in the system for shorter times, which would diminish the effects of disinfectants, chemical decomposition, and oxidation. There is a parallel concern with intentional contamination of the potable water system for large buildings, which include hospitals, hotels, office buildings, and government buildings. These systems are thought to be vulnerable since access to the system may not be well protected, the systems are not usually routinely monitored, there is minimal opportunity for dilution, and there is negligible chlorine residual.[13]

Points of vulnerability are also assessed by the type of attack. There is growing concern with the physical destruction of water system components as a predominant risk. This is due to the fact that explosives are much easier to obtain than destructive quantities of contaminants. According to Tracey Mehan, Assistant Administrator for Water, U.S. EPA, "Physical destruction of our systems, not necessarily the exotic biological or chemical threats, remains the biggest threat to things such as reservoirs, aqueducts (and chlorine tanks)."[14]

In addition, while a predominant focus of attention on terrorism has been on biological or chemical agents in aerosol form, there remains concern that contamination

through water and food is an easier, "low-tech" method to distribute a pathogen. Waterborne viability and resistance to disinfection are of particular concern. While many pathogens are susceptible to disinfectants, others that naturally produce oocycsts (e.g., *Cryptosporidium*) or spores (e.g., *Bacillus-anthrax*) may be resistant to chlorine disinfection. Other biological agents that may also be resistant include smallpox, anthrax, *botulinum toxin*, *tularemia*, and hemorrhagic fever viruses (Category A biological agents of high concern). An additional concern is that since biological toxins have a high potency, only a very small volume would be needed for an attack compared to other chemicals. Thus, the natural dilution factors in public water supplies may not offer effective protection. According to Nelson P. Moyer of the University Hygienic Laboratory, "the ideal waterborne agent of bioterrorism has a low infectious dose, produces severe gastrointestinal disease in a population with little or no immunity, and results in a higher percentage of systemic complications leading to death."[15]

POTENTIAL WATERBORNE AGENTS

There are many different biological and chemical agents that may cause harm when introduced into a drinking water system. For a contaminant to be most effective, it must be tasteless, odorless, and colorless. The potential for harm has been assessed according to grouping of agent. Those groups considered to be a threat include toxins, bacteria, viruses, and protozoa. As noted previously, nerve, blood, and blister agents are not generally considered a threat to the water supply systems.

Biological and chemical agents of concern have been identified and prioritized by several federal agencies and departments. Some agents can be naturally transmitted to humans by waterborne transmission. Others are transmitted to animals in water and to humans by food ingestion. A substantial portion of the biological agents that have the potential for weaponization also pose a definite, probable, or possible water threat. When assessing the potential threat of biological weapons agents, it is useful to consider the type (e.g. bacteria, protozoan, virus, biotoxin), weaponization status, stability in water, chlorine tolerance, and effectiveness of conventional treatment removal. *Microcystins*, a biotoxin, is an example of a biological agent that is possibly weaponized, poses a water threat, is stable in water, is resistant to chlorine at 100 ppm, and is immune to conventional treatment removal. When assessing the potential threat of chemicals to contaminate water, it is useful to consider the stability in water, the lethal dose via ingestion, resistance to standard drinking water treatment methods, detection capability, weaponization status, availability, capacity to cause morbidity or mortality, potential to cause public panic and social disruption, and the need for special action for public health preparedness. Chemicals that may be used by terrorists to contaminate water range from warfare agents (e.g. hydrogen cyanide) to toxic chemicals commonly used in industry (e.g. benzene).

MEASURES TO ENHANCE WATER SECURITY

Measures to enhance water security include performing vulnerability assessments, preventing the occurrence of attacks, minimizing the success of the attacks, and responding to events as they occur. These measures are briefly summarized below.

Methods continue to be developed for conducting vulnerability assessments for drinking water systems. One example of a protocol has been developed by Sandia Labs, and endorsed by the U.S. EPA. It is labeled the RAM-W protocol, and includes the following components:

- determine the mission and objectives of the water system
- perform a systematic site characterization of the water system
- identify and prioritize the adverse consequences that could occur
- identify the specific malevolent acts that could cause adverse consequences
- assess the likelihood of these malevolent acts
- identify the "design basis threat"
- evaluate the existing security system
- analyze the current risk and develop a prioritized plan to lower the risk[16]

Another example is the Vulnerability Self Assessment Tool (VSAT), which was developed by the Association of Metropolitan Sewerage Agencies with support from the U.S. EPA. Originally developed for wastewater utilities, VSAT has been revised to address drinking water systems and combined drinking water/wastewater systems. VSATs methodology and software provide a customized interactive framework for all size utilities to analyze security and evaluate potential improvements.[17]

An example of a vulnerability assessment tool for small drinking water systems is the National Rural Water Association/Association of State Drinking Water Administrators Security Vulnerability Self-Assessment Guide. It is designed for drinking water systems serving fewer than 3,300. It has also been revised to address vulnerability assessments for systems serving from 3,300 to 10,000.

To prevent the occurrence of terrorist attacks on drinking water, water utilities are taking significant measures. These include:

- installing security safeguards, such as guards, fences, and locks, to prevent access to treatment plants, reservoirs, and distribution systems.
- switching treatment technologies to avoid the need to store toxic chemicals such as gaseous chlorine
- increasing the number and frequency of routine tests for water quality
- considering installing devices for continuous water-system monitoring for microbes, microbial toxins, and chemical contaminants, or for changes in water quality that might signal a breach in the water system.[18]

If such preventative measures fail or are deliberately bypassed, a different set of measures are required. Early identification of the contaminants and their water-system source is essential for saving lives. It allows prompt treatment of those exposed and stops further use of the contaminated water. Another crucial element involves rapid tracing and clean-up of a contaminated water system.

The relative extent of risk to drinking water is influenced by the location of the introduction of a weaponized agent. It is generally believed that a large amount of material would be needed to deliberately contaminate a water source such as a reservoir. The practical ability of a terrorist to achieve this would be limited due to enhanced surveillance. However, contaminants introduced into a distribution system would pose a greater risk. They would be less susceptible to dilution and would reside in the system for shorter times, which would diminish the effects of disinfectants, chemical decomposition, and oxidation.

If the source water is sabotaged prior to treatment, various treatment options can be used depending on the type of contamination and amount of lead time. If the agent is ionized, conventional treatment may remove a portion of the chemical, and chlorination may oxidize an additional portion of the chemical. If the agent is suspended, filtration may be effective down to certain particle sizes. If the system has additional treatment options for specialized use (e.g., carbon adsorption, ion exchange and membrane filters), the threat may be reduced. It has not yet been determined whether home or faucet treatment devices, using multiple technologies (e.g., reverse osmosis, granular activated carbon, cartridge filtration, and disinfection), provide a substantial level of protection from highly toxic chemicals or microbial agents.[19]

However, concerns with the sufficiency of treatment remain. Generally, soluble chemicals in small concentrations will most likely pass through conventional treatment intact. Further, the effectiveness of processes for contaminant removal varies, and the quantification of such effectiveness is still being developed.

Overall, strategies to reduce vulnerabilities and risk should include the upgrading of operational systems, upgrading security systems, and changing company policies and procedures. This would ensure an integrated approach to drinking water security that responds to both terrorist threats and conventional needs.

Ultimately, the relationship between drinking water safety and homeland security can be clarified through an understanding of types of potential terrorist attacks on drinking water, points of vulnerability, potential waterborne agents, and measures to enhance drinking water security. In turn, this understanding can facilitate action to both prevent and respond to acts of terrorism while concurrently overcoming conventional challenges to drinking water safety.

CHAPTER 2
FEDERAL AUTHORITIES AND ACTION TO PROMOTE HOMELAND SECURITY AND DRINKING WATER SAFETY

Both before and after the tragic events of September 11, 2001 the federal government has taken significant measures to strengthen its ability to prevent and respond to acts of terrorism. These measures include the adoption of new legal authorities to address homeland security in general, and drinking water in particular. These authorities include legislation, presidential decision directives, and executive orders. The federal government has also increased homeland security and drinking water safety through policies, programs, and financial assistance, among other actions. These efforts are erecting the framework for confronting acts of terrorism. This framework continues to evolve, as new programs and approaches are developed.

I. AUTHORITIES SET FORTH IN FEDERAL LEGISLATION, EXECUTIVE ORDERS, AND POLICIES TO PROTECT WATER SUPPLIES FROM TERRORIST ACTIVITIES

General Homeland Security Laws

Homeland security authority is anchored in several federal laws that provide the broad framework for responding to terrorism. Even before September 11, Congress had enacted laws that address homeland security. Relevant laws that were adopted prior to September 11th include the following:

National Defense Authorization Act for Fiscal Year 1997, P.L. 104-201.

This Act, signed by President Clinton on September 23, 1996, includes a section entitled Title XIV: Defense Against Weapons of Mass Destruction. The section states that never before has there been a greater threat of hostile nations and terrorist groups obtaining radiological, biological and chemical weapons. North Korea, Iraq, Iran and Libya are listed as already possessing such weapons of mass destruction. The Act calls for an Emergency Response Assistance Program to be carried out in order to "provide civilian personnel of Federal, State, and local agencies with training and expert advice regarding emergency responses to a use or threatened use of a weapon of mass destruction or related materials." It also calls for a Chemical-Biological Emergency Response Team, to be developed and maintained by the Secretary of Defense. The Secretary of Defense is also required to "develop and carry out a program for testing and improving the responses of Federal, State, and local agencies to emergencies involving biological weapons and related materials and emergencies involving chemical weapons and related materials." While this law provides extensive information regarding defense against weapons of mass destruction, it does not directly address water security.

Biological Weapons Anti-Terrorism Act of 1989, as amended in 1996, 18 U.S.C.A. § 175 (1996).

The purpose of this Act is to implement the Biological Weapons Convention and to protect the United States against the threat of biological terrorism. It establishes prohibitions with respect to biological agents used as weapons. The term "biological agent" does not encompass any biological agent or toxin that is in its naturally-occurring environment, as long as the biological agent of toxin has not been cultivated, collected, or otherwise extracted from its natural source. The term "for use as a weapon" includes the development, production, transfer, acquisition, retention, or possession of any biological agent, toxin, or delivery system for other than prophylactic, protective, bona fide research, or other peaceful purposes. The act does not specifically address waterborne incidences.

Following and in response to the terrorist acts of September 11th, Congress took further action to protect the homeland. Laws adopted include:

USA PATRIOT Act, P.L. 107-56.

The USA PATRIOT Act was signed into law by President Bush on October 26, 2001. "USA PATRIOT" is an acronym for "Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism." The Act includes sections pertaining to the protection of critical infrastructures, which are defined as "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national

public health or safety, or any combination of those matters." One section calls for the expansion of regional information-sharing systems designed to facilitate Federal, state, and local law enforcement responses related to terrorist attacks. To fund this measure, $50 million was appropriated for FY 2002 and $100 million for FY 2003.

A second section of the Act, relating to critical infrastructure protection, calls for public-private partnerships to ensure that any physical or virtual disruption of the operation of critical physical and information infrastructures, including telecommunications, energy, financial services, water, and transportation sectors, are "rare, brief, geographically limited in effect, manageable, and minimally detrimental to the economy, human and government services, and national security of the United States." The section also calls for the establishment of "the National Infrastructure Simulation and Analysis Center (NISAC) to address critical infrastructure protection and continuity through support for activities related to counterterrorism, threat assessment, and risk mitigation." The sum of $20 million was authorized for the Defense Threat Reduction Agency for activities of the National Infrastructure Simulation and Analysis Center in FY 2002.

Homeland Security Act of 2002, P.L. 107-296

In light of the continuing need to comprehensively address the threat of terrorism, Congress took major action in the fall of 2002, when it adopted the Homeland Security Act. In November 2002, President Bush signed the Homeland Security Act into law, creating a cabinet-level Department of Homeland Security that combined 22 federal agencies with an estimated budget of $37.4 billion, and setting into motion the most sweeping reorganization of the executive branch in the last half-century.

The law in effect requires a number of major government agencies to relinquish their independent status and to join the Department of Homeland Defense. These include the Secret Service; the U.S. Coast Guard; the Customs Service; Transportation Security Administration; the Federal Emergency Management Agency; the Immigration and Nationalization Service; and the border inspection part of the Animal and Plant Health Inspection Service. The new department is organized around four priorities: first responders, biological defense, border security, and the fusion of information and intelligence. It is authorized to analyze intelligence and legally accessible information from multiple sources such as the Central Intelligence Agency; National Security Agency; Federal Bureau of Investigation; Drug Enforcement Administration; Department of Energy; Customs Service, and Department of Transportation. In addition, the Homeland Security Secretary is empowered to designate a lead research organization to help coordinate security research across the government, the academic community, and the private sector.

The Homeland Security Act includes a provision that establishes and funds a Homeland Security Advanced Research Projects Agency, similar to the Department of Defense's DARPA, to help identify promising technologies. The Act also includes provisions that encourage partnerships between government and the private sector to better protect civilian infrastructure, such as telecommunications, transportation nodes, and power grids. Further, it establishes procedures to encourage private industry to share any infrastructure vulnerabilities with the government to help identify and correct weaknesses, and calls for a so-called NET Guard—volunteer teams to help local communities respond and recover from attacks on information systems and communications networks.

Homeland Security Law Addressing Drinking Water

Following the events of September 11th, Congress responded to the urgent need to protect the nation's drinking water supplies directly by adopting amendments to the Safe Drinking Water Act. This law is the Public Health Security and Bioterrorism Preparedness and Response Act, P.L. 107-188 (Title IV - Drinking Water Security and Safety, inserted into the SDWA [Title XIV of the Public Health Services Act as Sections 1433, 1434, 1435]). Congress appropriated $83 million to carry out the functions of the Act.

Initially, the Act instructs the U.S. EPA to

> provide baseline information to community water systems required to conduct vulnerability assessments regarding which kinds of terrorist attacks or other intentional acts are the probable threats to:
>
> - o (a) substantially disrupt the ability of the system to provide a safe and reliable supply of drinking water; or
> - o (b) otherwise present significant public health concerns.

It also requires all public water systems that serve populations of 3,300 people or more to:

- conduct a vulnerability assessment;
- certify and submit a copy of the assessment to the EPA Administrator (within a specified schedule—see below);

- prepare or revise an emergency response plan that incorporates the results of the vulnerability assessment; and,
- certify to the EPA Administrator within six months of completing the vulnerability assessment that the system has completed such a plan.

Further, the Act establishes the following due dates for certification and submission of the vulnerability assessments, and for certification of the emergency response plans:

Systems serving population of:	Must certify and submit vulnerability assessment by:	Must submit certification of completion of Emergency Response Plans by:
100,000 or greater	March 31, 2003	6 months after submission of vulnerability assessment
50,000 – 99,999	December 31, 2003	6 months after submission of vulnerability assessment
3,301 – 49,999	June 30, 2004	6 months after submission of vulnerability assessment

Finally, it requires community water systems to prepare or revise emergency response plans. EPA certification of the plans is required within six months of the completion of each system's vulnerability assessment.

The Act provides a basis for understanding the vulnerabilities of public water supply systems that serve large populations to terrorist acts. It does not fully address the mechanisms, including funding, by which large public water supply systems can address those vulnerabilities identified in the assessment and emergency response plan. Further, while it imposes a duty on small systems to develop emergency response plans, it also does not address funding the implementation of those plans.

Presidential Decision Directives

In addition to Congressional action, important authority addressing homeland security is found in Presidential Decision Directives (PDD). The PDDs addressing homeland security include provisions that predate September 11th. These include:

Presidential Decision Directive 39: US Governmental Interagency Domestic Terrorism, Concept of Operations Plan. The plan provides overall guidance to federal, state, and local agencies concerning how the federal government would respond to potential or actual terrorist threats in the United States. Specifically, it directed the Attorney General to assess the vulnerability of the nation's critical infrastructures and recommend measures to protect them. In 1996, this assessment led former President Clinton to issue Executive Order 13010. The E.O. identified telecommunications, banking and finance, transportation, electric power, gas and oil storage and delivery, water supply systems, emergency services, and government operations as elements or sectors of the nation's critical infrastructures. The E.O. also created the Commission on Critical Infrastructure and directed it to study the problem and propose solutions.

Presidential Decision Directive 62: Protection Against Unconventional Threats to the Homeland and Americans Overseas (also referred to as the Combating Terrorism Directive). This directive highlights the growing threat of unconventional attacks against the United States. It details a new, more systematic approach to fighting terrorism by bringing a program management approach to counter-terrorism efforts. The directive also established the office of the National Coordinator for Security, Infrastructure Protection and Counter-Terrorism, which oversees a broad variety of relevant policies and programs, including areas such as counter-terrorism, protection of critical infrastructure, preparedness, and consequence management for weapons of mass destruction.

THE PUBLIC HEALTH SECURITY AND BIOTERRORISM PREPAREDNESS AND RESPONSE ACT IMPOSES THE FOLLOWING REQUIREMENTS:

* requires community water systems serving more than 3,300 people to conduct an assessment of the vulnerability of its systems to terrorists attacks (schedules vary depending on size);

* assessments must include review of pipes, physical barriers, water collection, pre-treatment, treatment, storage and distribution facilities, computer system, chemical storage, maintenance;

* within 6 months of completion of the vulnerability assessment, water system must submit an emergency response plan.

Presidential Decision Directive 63: Protecting America's Critical Infrastructures (also referred to as the Critical Infrastructure Protection Directive). The Critical Infrastructure Protection Directive calls for a national effort to assure the security of the increasingly vulnerable and interconnected infrastructures of the United States. Such infrastructures include telecommunications, banking and finance, energy, transportation, and essential government services. The directive requires immediate federal government action including risk assessment and planning to reduce exposure to attack. It stresses the critical importance of cooperation between the government and the private sector by linking designated agencies with private sector representatives. This directive specifically addresses water security by designating the water sector as a critical infrastructure and calls for protection against attacks on physical facilities and computer systems.

The Presidential Decision Directives provide a framework for addressing acts of terrorism and also clearly establish the importance of water as a critical component of homeland security. Given that the presidential action spans multiple administrations both before and after September 11th, the directives provide an indication of the significance of homeland security for the American people.

Executive Orders

In addition to laws and Presidential Decision Directives, homeland security is also addressed through executive orders. Executive orders on homeland security have been issued both before and after September 11th. They are summarized below.

E.O. 13010: Executive Order on Critical Infrastructure Protection. The assessment mandated by PDD 39 (see above) led former President Clinton to issue Executive Order 13010. This E.O. identified telecommunications, banking and finance, transportation, electric power, gas and oil storage and delivery, water supply systems, emergency services, and government operations as elements or sectors of the nation's critical infrastructures. It also created the Commission on Critical Infrastructure and directed it to study the problem and propose solutions.

E.O. 13228: Executive Order Establishing Office of Homeland Security. This order, signed by President Bush on October 8, 2001, establishes the Office of Homeland Security, which is to be headed by the Assistant to the President for Homeland Security. The E.O. establishes the mission of the office as: "to develop and coordinate the implementation of a comprehensive national strategy to secure the United States from terrorist threats or attacks." In addition to preparing the national strategy, the office is to "coordinate the executive branch's efforts to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States." The E.O. does not specifically address the protection of water against acts of bioterrorism.

E.O. 13231: Executive Order on Critical Infrastructure Protection. This order, signed by President Bush on October 16, 2001, establishes the Critical Infrastructure Protection Board. The purpose of the board is to recommend and coordinate programs to protect the information systems on which critical infrastructures depend. The order lists the critical infrastructures as: telecommunications, energy, financial services, manufacturing, water, transportation, health care, and emergency services sectors. The board is to work with federal, state and local governments, private corporations, and nongovernmental and academic organizations to: "ensure that systems are created and well managed to share threat warning, analysis, and recovery information among government network operation centers, information sharing and analysis centers established on a voluntary basis by industry, and other related operations centers;" "coordinate programs to ensure that government employees with responsibilities for protecting information systems for critical infrastructure, including emergency preparedness communications, and the physical assets that support such systems, are adequately trained and evaluated;" "coordinate with the Director of the Office of Science and Technology Policy (OSTP) on a program of Federal Government research and development for protection of information systems for critical infrastructure;" and "promote programs against cyber crime and assist Federal law enforcement agencies in gaining necessary cooperation from executive branch departments and agencies," among other duties. Ultimately, while the order does not specifically address drinking water protection in detail, it does include "water" on the list of critical infrastructures.

As with the Presidential Decision Directives, the executive orders on homeland security clearly establish the importance of water, including drinking water and wastewater, as a resource to be protected from acts of terrorism. The executive orders provide additional clarity on the framework pursued by the federal government, and serve to advance capabilities for responding to terrorist threats.

II. FEDERAL AGENCY ACTIVITY FOR DRINKING WATER SECURITY

In addition to the adoption of federal laws to protect homeland security and drinking water, the federal government has taken other actions, including the adoption of policies, establishment of programs, and the provision of financial and technical assistance. The National Strategy for Homeland Security charged EPA with crisis and consequence management responsibilities, including drinking water protection. In addition, other agencies retain responsibilities that affect drinking water security. EPA's water infrastructure security plan, along with selected policies, programs, and financial and technical assistance of other agencies, illustrate the nature of activities by federal agencies to ensure drinking water security.

Agency Policies and Programs

The issue of homeland security has been embraced and addressed by the federal government agencies whose functions influence drinking water protection in this country. While the predominant attention on drinking water is paid by the U.S. EPA, the efforts of numerous additional agencies affect drinking water security. The manner in which these agencies enunciate policies that specifically pertain to drinking water security varies. This section first provides an overview of the U.S. EPA's policies and other activities. Then, it follows with a brief survey of the other federal agencies and the policies they have promulgated in defining their roles in drinking water security issues.

U.S. Environmental Protection Agency

In September 2002, the U.S. EPA published its Strategic Plan for Homeland Security, a document that integrates homeland security mandates with U.S. EPA's core mission of protecting public health and safeguarding the environment. The Strategic Plan identifies goals in each of four major mission-critical areas: (1) critical infrastructure protection; (2) preparedness, response, and recovery; (3) communication and information; and (4) protection of U.S. EPA personnel and infrastructure. Within each mission area are goals and tactics. While U.S. EPA's Strategic Plan presents actions as proposed, many of them are already underway.

The issue of drinking water is directly addressed in the Strategic Plan under the mission-critical area of "Critical Infrastructure Protection." Goals and tactics related to drinking water security are discussed below:

Goal 1: EPA will work with states, tribes, drinking water and wastewater utilities, and other partners to enhance the security of water and wastewater utilities.

EPA draws upon its authority under the Safe Drinking Water Act and the Clean Water Act, as well as its history of close cooperation with other government agencies and water utilities in defining its role in the effort to ensure the safety of America's drinking water supply. EPA identifies six tactics to enhance drinking water security:

(1) Vulnerability assessment

EPA states that it will work with the states, tribes, associations and others to provide tools, training and technical assistance to aid water utilities in conducting vulnerability assessments, implement security improvements, and effectively respond to terrorist events (Tactics 1.1). EPA announces that it plans to launch a tiered schedule of disbursements to water utilities, beginning in FY2002 with those that service large drinking water systems, for the purpose of facilitating the production of vulnerability assessments, security enhancement designs, and/or emergency response plans (*Id.*). EPA projects that by 2005, unacceptable security risks at water utilities across the country will be significantly reduced through completion of vulnerability assessments, the design of security enhancement and emergency response plans, and implementation of security enhancements (Tactics 1.1 – Results).

(2) Development of methods to prevent, detect, and respond to contaminants

U.S. EPA will work with the Department of Homeland Security, other federal agencies, universities, and the private sector in the following areas:

(a) assessment of terrorist actions and the implementation of water security practices;
(b) the improvement of formal communication mechanisms;
(c) the fostering of coordination with the homeland security apparatus;
(d) the identification of alternative drinking water sources; and,
(e) the reduction of vulnerabilities to drinking water supplies.

Goal 2: U.S. EPA will work with the states, tribes, and other partners to enhance security in the chemical and oil industry.

Under the statutory authorities cited by the agency, U.S. EPA has framed its role as deriving from its power to require actions to prevent and prepare for releases. The primary focus is on the Clean Air Act (CAA), Resources Conservation and Recovery Act (RCRA), and federal pesticides and toxic substances laws. More specifically related to drinking water are the Clean Water Act (CWA) and Oil Pollution Act (OPA), which address actions to prevent and prepare for releases of petroleum facilities that could adversely impact drinking water sources and thereby pose substantial harm to the public and the environment.

Goal 3: U.S. EPA will work with other federal agencies, the building industry, and other partners to help reduce the vulnerability of indoor environments in buildings to chemical, biological, and radiological (CBR) incidents.

While the primary focus of this goal is airborne attacks, there is potential relevance to drinking water for buildings that contain water service capacities, such as hospitals and hotels. Of special relevance is the task to evaluate the efficacy and feasibility of new technologies to protect building occupants from possible terrorist threats.

Goal 4: U.S. EPA will help to ensure that critical environmental threat monitoring information and technologies are available to the private sector, federal counterparts, and state and local governments to assist in threat detection.

While the primary focus of this goal is also on airborne releases, there is potential relevance to drinking water. For both water and air releases, there is a strong need for advancing the science of chemical and biological monitoring and detection technologies. Applicable economies of scale should be pursued where relevant.

Goal 5: U.S. EPA will be an active participant in national security and homeland security efforts pertaining to food, transportation, and energy.

U.S. EPA acknowledges the lead that other agencies take in addressing food, transportation, and energy. However, the agency, in its formulation of Goal 5, offers its base of knowledge and experience accrued through implementing federal environmental laws, including those that pertain to drinking water, to contribute to the federal government's efforts to secure these sectors. In particular, U.S. EPA proffers its water utility system as a model for other federal agencies (e.g. Food and Drug Administration, U.S. Department of Agriculture) to use in development of a secure, electronic communication system for federal, state, and local governments that deal with food. U.S. EPA also places the water security interest in this goal by stating that it intends to participate in preparedness exercises conducted by other federal agencies created for food and water incidents.

Goal 6: U.S. EPA will manage its federal, civil, and criminal enforcement programs to meet our homeland security, counter-terrorism, and anti-terrorism responsibilities under Presidential Decision Directives (PDD) 39, 62, and 63, and environmental civil and criminal statutes.

In structuring Goal 6, U.S. EPA stresses its role in compliance and enforcement as the key to fulfilling its homeland security, counter-terrorism, and anti-terrorist responsibilities under the pertinent Presidential Decision Directives. Incorporated by implication are those enforcement programs that are directly related to drinking water security.

Other Federal Agency Action

Office of Homeland Security (OHS). The Office of Homeland Security published its *National Strategy for Homeland Security* in July 2002. The goal of "Protecting Critical Infrastructures and Key Assets" is identified as one of the report's "Critical Mission Areas." This initial strategy cites water as one of the critical infrastructure components, but no specific policies or guidelines for protecting the drinking water supply from terrorist attacks are mentioned.

Department of Homeland Security. On November 25, 2002, President Bush signed the bill creating the new Department of Homeland Security, and on January 24th, 2003, the new department came into existence. The new department has five major divisions, or "directorates"—border and transportation security, emergency preparedness and response, science and technology, informational analysis and infrastructure protection, and management.

In February 2003, the department released "The National Strategy for The Physical Protection of Critical Infrastructures and Key Assets." The strategy lists the following as "Critical Infrastructure Sectors:" Agriculture, Food, Water, Public Health, Emergency Services, Government, Defense Industrial Base, Information and Telecommunications, Energy, Transportation, Banking and Finance, Chemical Industry and Hazardous Materials, Postal and Shipping. The strategy identifies the U.S. EPA as the lead agency for the protection of the water sector, and includes a section on the water sector that delineates a framework for addressing water security.

According to the strategy, the water sector consists of two basic components: fresh water supply and wastewater collection and treatment. Water sector infrastructures are recognized as diverse, complex, and distributed, ranging from systems that serve a few customers to those that serve millions. On the supply side, the primary focus of critical infrastructure protection efforts is the nation's 170,000 public water systems. These utilities depend on reservoirs, dams, wells, and aquifers, as well as treatment facilities, pumping stations, aqueducts, and transmission pipelines.

The strategy also delineates the priorities among the wide range of protective measures that should be taken. It acknowledges that the water sector is focusing on the types of infrastructure attacks that could result in significant human casualties and property damage or widespread economic consequences. In general, there are four areas of primary concentration: physical damage or destruction of critical assets, including intentional release of toxic chemicals; actual or threatened contamination of the water supply; cyber attack on information management systems or other electronic systems; and interruption of services from another infrastructure.

To address these potential threats, the report identifies the water sector requirements, including increased monitoring and analytic capabilities to enhance detection of biological, chemical, or radiological contaminants that could be intentionally introduced into the water supply. The strategy also highlights the need for additional focused threat information in order to direct investments toward enhancement of corresponding protective measures. To improve the flow of information among water-sector organizations, the industry has begun development of its sector Information Sharing and Analysis Center (ISAC). The Water ISAC will provide a secure forum for gathering, analyzing, and sharing security related information. Additionally, several federal agencies are working together to improve the warehousing of information regarding contamination threats, such as the release of biological, chemical, and radiological substances into the water supply, and how to respond to their presence in drinking water.

Finally, the report recognizes that approaches to emergency response and the handling of security incidents at water facilities vary according to state and local policies and procedures.With regard to the public reaction associated with contamination or perceived contamination, it is essential that local, state, and federal departments and agencies coordinate their protection and response efforts.

Department of Justice (DOJ). The Department of Justice's Office of Justice Programs (OJP) houses the Office for Domestic Preparedness (ODP). ODP describes itself as "the Department of Justice component responsible for enhancing the capabilities of state and local jurisdictions to prepare for, and respond to, incidents of domestic terrorism involving chemical and biological agents, and nuclear, radioactive, and explosive devices." The forms of assistance that ODP provides to state and local jurisdictions include grant funds to enable jurisdictions to purchase specialized equipment for emergency response agencies, the provision of training to emergency response personnel, support for state and local emergency response exercises, and technical assistance to state and local emergency response agencies and public officials.

In August 2002, ODP published *Emergency Responder Guidelines*, a document that establishes awareness and performance goals, and develops planning and management guidelines for first responders in the fields of law enforcement, fire service, emergency medical services, emergency management, and public works. Although the report includes drinking water and wastewater treatment operations in its definition of "public works facilities," these guidelines do not include information that is specific to the role of first responders that work in drinking water operations.

The Office of Justice Programs also contains the Bureau of Justice Assistance (BJA), which administers Edward Byrne Memorial State and Local Law Enforcement Block Grants (commonly referred to as Byrne Formula Grants). States may use formula funds to support a range of activities that are related to terrorism and domestic preparedness. For example, Byrne Formula Grants can be used by state natural resource conservation commissions to purchase equipment for "real-time" monitoring of drinking water supplies.

One example of ODP's drinking water security activities is their grant to the National Emergency Response and Rescue Training Center, based in College Station, Texas, for training courses and a manual on *Acts of Terrorism/Weapons of Mass Destruction (WMD) Preparedness and Response for Water and Wastewater Executives*. This educational program provides training to executive-level professionals on issues concerning preparing for, responding to, and recovering from a WMD/terrorism incident targeted toward water and/or wastewater facilities.

Federal Emergency Management Agency (FEMA). The Federal Emergency Management Agency has historically focused on measures to be taken in the face of natural disasters (e.g. floods or tornadoes). After the events of September 11th, FEMA has expanded its focus to include homeland security. While FEMA has not specifically addressed the vulnerability of drinking water supplies to acts of terrorism, the ascendancy of drinking water security concerns is implied in FEMA's December 2001

report, entitled *Trends in State Terrorism Preparedness*, which addresses the posture of the states with regard to their present abilities to respond to threats to critical infrastructure security. Further, many activities undertaken by FEMA can have an impact on water security. For example, FEMA supports the growth of the Citizen Corps Councils and Community Emergency Response Teams (CERTs) at the local level in support of homeland security initiatives for developing and enhancing volunteer response teams. The councils involve first responders groups, emergency managment agencies, volunteer service organiztions, the private sector, and local governments. The purpose is to engage citizens in homeland security and community and family preparedness, through education, training, and volunteer service.

Department of Health and Human Services (HHS). HHS is the lead agency within the federal government for addressing the medical and public health consequences of all manner of mass casualty events, including but not limited to terrorist-induced events. It engages in a variety of activities to prevent, identify, and respond to incidents of bioterrorism. These include epidemic detection and response; maintaining and securing the National Pharmaceutical Stockpile; performing research to improve the methods, training, and health care service delivery; and assisting state, local, and other federal partners in improving the capacity to respond to an emergency. These activities are administered through several agencies, including the Centers for Disease Control and Prevention (discussed more fully below), the National Institutes of Health, the Office of Emergency Preparedness, the Health Resources and Services Administration, the Substance Abuse and Mental Health Services Administration, the Agency for Healthcare Research and Quality, and the Food and Drug Administration.

Information on HHS's activities to address homeland security is disseminated through its web site on "Disasters and Emergencies," which includes material under the headings of "Biological and Chemical Weapons" and "Bioterrorism." There is also included on the website a "Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks," but there is no similar guidance for waterborne attack. The "Disasters and Emergencies" portion of the web site also includes a "Safety of the Water Supply" subsection that provides information on arsenic, lead, and other drinking water contaminants without specifically addressing bioterrorism, or contaminants introduced as acts of terror.

Operating as part of HHS, the Centers for Disease Control and Prevention (CDC) maintain an important role in homeland security by ensuring public health preparedness. Public health preparedness is extremely important to address covert terrorist attacks in which a biological or chemical agent might be surreptitiously released into a municipal water supply. CDC also plays a role in drinking water security. It works with many partners, including state and local health agencies, water utilities, U.S. EPA, FBI, and other federal partners. Major functions include:

- ensuring early detection of intentionally caused chemical or microbial contamination of water;
- contributing to the epidemiologic investigation if a disease outbreak is linked to contaminated water;
- facilitating state and federal planning for the investigation of potential and actual terrorist events;
- helping arrange surge capacity for rapid emergency expansion of water-testing laboratories;
- helping establish secure channels for crisis communications with water utilities, state and local health departments, and federal partners; and,
- supporting research to determine how long priority agents can survive in water, how susceptible they are to common water treatments, and what quantity an individual must ingest to become ill.

Even before September 11th, CDC had taken major action to address terrorism. In April 2000, it published its "Biological and Chemical Terrorism: Strategic Plan for Preparedness and Response Recommendations of the CDC Strategic Planning Workgroup" in the *Morbidity and Mortality Weekly Report*. The report addresses the following topics: U.S. Vulnerability to Biological and Chemical Terrorism, Overt versus Covert Terrorist Attacks, Focusing Preparedness Activities, Key Focus Areas, and Partnerships and Implementation. The Key Focus Areas include Preparedness and Prevention, Detection and Surveillance, Diagnosis and Characterization of Biological and Chemical Agents, Response, and Communication Systems. CDC recognizes that chemical agents can be diverted covertly through contaminated food or water, but in this report there are no recommendations regarding ways in which water security can be heightened. It highlights the need for preparedness for terrorist-caused outbreaks and injuries as an essential component of the U.S. public health surveillance and response system. It specifically recognizes contaminated municipal water supplies as an area to protect the population against any unusual public health event. It also provides for a multilevel laboratory response network for bioterrorism that will link clinical labs to public health agencies. Finally, it lists pathogens that are waterborne or food-borne. (CDC MMWR 4/21/2000)

Since September 11th, CDC has continued to engage in significant activities regarding the public health implications of terrorism. Efforts related to drinking water include the preparation of fact sheets, which are listed on its web site, about specific chemical and biological agents that may be used in a terrorist act (e.g. Facts about Phosgene).

Federal Bureau of Investigation (FBI). In the event of a terrorist incident, the FBI is the lead federal agency for crisis management. It coordinates a threat assessment process to assess the credibililty of communicated threats involving chemical, biological, and radiological/nuclear materials, including any directed against the water infrastructure. The FBI maintains close coordination with the U.S. EPA in order to facilitate response planning for terrorist incidents at facilities under the purview of U.S. EPA.

Under the aegis of the FBI, the National Infrastructure Protection Center (NIPC) serves as a national critical infrastructure threat assessment, warning, vulnerability, and law enforcement investigation and response entity. Its mission is to provide "a national focal point for gathering information on threats to the infrascctuctures," and to provide the means of "facilitating and coordinating the Federal Government's response to an incident, mitigating attacks, investigating threats and monitoring reconstitution efforts." The NIPC provides timely warnings of international threats, comprehensive analysis, and law enforcement investigation and response.

NIPC focuses on the eight critical infrastructure areas emphasized by President Clinton's 1996 Executive Order 13010, "whose services are so vital that their incapacity or destruction would have a debilitating impact on the defense or economic security of the United States." Among these critical infrastructure areas are the water supply systems, defined by NIPC as follows:

> Water Supply Systems: A critical infrastructure characterized by the source of water, reservoirs and holding facilities, aqueducts and other transport systems, the filtration, cleaning and treatment systems, the pipeline, the cooling systems, and other delivery mechanisms that provide for domestic and industrial applications, including systems for dealing with water runoff, waste water, and firefighting.

Within the NIPC umbrella is the Key Asset Initiative (KAI), a revitalized program aimed at creating a professional relationship between the FBI and identified Key Assets on a local level. A Key Asset is defined as an organization, group of organizations, system, or groups of systems, or physical plant of which the loss would have widespread and dire economic or social impact. Key Assets are categorized within a three-tier system:

- A Tier One Key Asset is an entity that has national importance, the loss of which would have an immediate, long-term impact on the U.S. as both socially and economically.
- A Tier Two Key Asset would have a regional impact if destroyed or seriously harmed.
- A Tier Three Key Asset would have a local impact in case of loss or disruption.

With Key Asset Coordinators in all 56 field offices of the FBI, the overall objective of the KAI is to maintain a database of information concerning Key Assets within each field office's jurisdiction, establish lines of communication with Key Asset owners and operators to improve cyber and physical security, and to enhance ongoing coordination with other federal, state, and local government entities, to ensure their involvement in the protection of critical infrastructures. The presumption is that since water supply systems have been identified as part of the critical infrastructure, the definition of Key Asset owners is one that is inclusive of owners and operators of drinking water supply systems.

Transportation Security Agency (TSA). The Transportation Security Agency is a new agency within the Department of Transportation that is charged with providing security for the nation's transportation system. Its purpose is to protect the nation's transportation systems to ensure freedom of movement for people and commerce.

The agency is charged with implementing the Arming Pilots Against Terrorism Act, passed as part of the Homeland Security Act of 2002. This act requires the TSA to establish a program to select, train, deputize, equip, and supervise volunteer pilots of air carriers for the purpose of defending the flight decks of passenger aircraft against acts of criminal violence and air piracy. Pursuant to the USA Patriot Act of 2001, the agency issued an interim final rule requiring background checks on commercial drivers who are certified to transport hazardous materials.

The agency also addresses technologies to secure the nation's ports and waterways.

U.S. Army Corps of Engineers (USACE). The USACE has been active in fostering dialogue about water issues generally among professional associations and federal agencies through the sponsoring of major conferences on infrastructure systems, which include workshops on such topics as dam safety. By implication, USACE is also engaged in drinking water security issues through its par-

ticipation in The Infrastructure Security Partnership (TISP), a post-Septemeber 11th collaboration between professional associations and federal agencies. In conjunction with TISP, USACE is currently involved in launching two initiatives that will have an impact on drinking water security concerns: (1) the development of a web-based matrix of skills among infrastructure security experts, and (2) the development of a volunteer contacts list of first responders for local authorities to tap into during a crisis. The USACE's role in maintaining reservoirs that may serve as a source of drinking water provides a link to drinking water security.

Joint Agency Endeavors

In addition to agency-specific action, the federal government also engages in a variety of joint endeavors. These endeavers also include alliances with non-governmental organizations. Examples are provided below.

Coplan. The U.S. Government Interagency Domestic Terrorism Concept of Operations Plan ("Coplan") was prepared January 2001. The Coplan was developed though the efforts of the six primary departments and agencies (DOJ/FBI, FEMA, DOD, Department of Energy, HHS, and U.S. EPA) with responsibilities identified in PDD 39 and PDD 62. It addresses water to a limited degree under the description of agency activities for U.S. EPA. It clarifies that U.S. EPA and the U.S. Coast Guard share responsibilities for response to oil discharges into navigable waters and release of hazardous substances, pollutants, and contaminant into the environment under the national oil and hazardous substances pollution continency plan.

TISP. The Infrastructure Security Partnership (TISP) was born out of the tragic events of September 11th, when a dedicated group of public and private-sector organizations proposed the establishment of a partnership to collaborate on issues related to the security of the nation's built environment.

The partnership aspires to function as a national asset facilitating dialogue on domestic infrastructure security and related policy, and as a resource for technical support. The partnership collaborates on issues related to the security of the nation's built environment and leverages members' collective technical expertise and research and development capabilities. A central goal of the partnership is outreach to and inclusion of all potential stakeholders and the provision of technical assistance and information to the Office of Homeland Security.

The partnership articulates its purposes as the following:

1. Promote joint efforts to improve anti-terrorism and asset protection methods and techniques for the built environment.
2. Promote the participation of all interested organizations and ensure effective communication between all participating entities from the national to the state and local level.
3. Cooperate in the identification and dissemination of data and information related to the security of the built environment.
4. Promote effective and efficient transfer of infrastructure security knowledge from research to codes, standards, public policy, and general practice.
5. Encourage synergy between organizations to react quickly and positively to issues of significance.
6. Promote effective professional relationships to further the advancement of the infrastructure industry.
7. Encourage and support the development of a methodology for assessing vulnerabilities.
8. Encourage the establishment of protocols related to the sensitivity of information generated and distributed by the partnership.
9. Consider consequences of anti-terrorism/asset protection measures to occupants of facilities and emergency responders.

Financial Assistance Opportunities

An early response by the federal government to September 11th was to provide finanical assistance through grants and other mechanisms to state agencies and other sub-national entities to address needs that arose directly and incidentally from the attacks. To a large extent, these grants were awarded prior to the passage of specific homeland security laws. The money was funneled to recipients through various federal agencies, including the U.S. EPA, the Centers for Disease Control, and the Department of Justice. A significant portion of these grants related directly to drinking water security. The following short synopsis of several such grants illustrates the nature of the financial assistance that was provided to address homeland security and drinking water.

U.S. Environmental Protection Agency. In early 2002, the U.S. EPA created a $53 million grant program to help publicly-owned drinking water facilities that serve more than 100,000 people. The grants ranged up to $115,000 and were earmarked to be used for assessing a facility's vulnerabilities, for planning responses to emergencies, and for developing security enhancement plans. In June 2002, President Bush signed a bill making vulnerability assessments and emergency response plans mandatory for all water systems, except those serving fewer than 3,300 peo-

ple. To assist systems with the new requirements, the new law authorized $160 million for continued assistance to utilities. However, on August 13, 2002, that sum was cut substantially when President Bush rejected $5.1 billion of the $28.9 billion authorized by the 2002 Supplemental Appropriations Act for Further Recovery From and Response To Terrorist Attacks on the United States (Public Law 107-206, as of August 2, 2002). The $5.1 billion included $50 million that would have gone to the EPA in order to assist medium and small water systems—the later and last recipients in the tiered disbursement schemes—to complete their vulnerability assessments.

Centers for Disease Control and Prevention. In February 2002, the CDC announced the availability of fiscal year 2002 funds in the amount of approximately $9.18 million, provided under Program Announcement 99051, for the cooperative agreement program to upgrade state and local public health jurisdictions preparedness for and response to bioterrorism, other outbreaks of infectious disease, and other public health threats and emergencies. The program addresses the "Healthy People 2010" priority areas (Immunization and Infectious Diseases, Environmental Health, Public Health Infrastructure, and Surveillance and Data Systems) and implements selected activities authorized under the Public Health Service Act. Eligible recipients may request support for activities under all of the following Focus Areas:

a. Preparedness Planning and Readiness Assessment
b. Surveillance and Epidemiology Capacity
c. Laboratory Capacity — Biological Agents
d. Laboratory Capacity — Chemical Agents
e. Health Alert Network/Communications and Information Technology
f. Communicating Health Risks and Health Information Dissemination
g. Education and Training

Another program funded by the Centers for Disease Control and Prevention, announced in October 2002, awarded $1.2 million to the Harvard Consortium for a pilot program to develop an early warning system for terrorist attacks. The project was conceived to be just one element of a national warning system that would utilize managed care networks that already exist, scanning these systems continually for clusters of illness.

Ultimately, both before and after the tragic events of September 11, 2001, the federal government has taken action to strengthen its ability to prevent and respond to acts of terrorism, including those with the potential to affect drinking water. Since that date, significant measures taken include legislation, executive orders, presidential decision directives, financial assistance and new policies and programs. These measures form the basis for protecting drinking water from both terrorist and conventional threats.

CHAPTER 3
SELECTED ENVIRONMENTAL AUTHORITIES RELEVANT TO HOMELAND SECURITY

In addition to the authorities that address terrorism through specific homeland security legislation and policies, there is additional authority to address homeland security issues through traditional environmental statutes administered by the U.S. EPA. There are several types of circumstances in which environmental laws may be applied to homeland security. First, environmental laws may apply to the act of terrorism itself, to the extent that the act involves the release of a biological, chemical, or radiological agent. Second, environmental laws may apply to site-specific actions taken in response to a terrorist event, which include remediation measures and sanctions against the responsible party. Third, environmental laws may apply to government programs or projects developed as systemic responses to homeland security needs. Fourth, environmental laws may apply to specific biological, chemical or radioactive agents that may become weaponized for terrorist actions, even prior to such use.

The following factual situations illustrate the intersection of environmental and homeland security issues, and describe instances in which authorities could invoke environmental laws:

- A holding tank for a city's drinking water is intentionally contaminated with a chemical agent. That water must be removed from the tank and disposed of in a manner that does not cause harm to the environment or public health.
- A building is intentionally contaminated with a biological agent. As part of the response action, the contaminated area is washed with water. That water is then discharged into the city's sewer system.
- An explosive device is discharged at a facility that has hazardous materials on-site. Hazardous materials are released into the air. When the fire department arrives, water is mixed with the hazardous materials and it runs into the nearby river, which is a source of drinking water for the town.
- A domestic organization with a strong financial base is determined to have caused the release of a chemical or biological agent into a water supply reservoir. The release constitutes a violation of an environmental law that provides for a penalty per violation per day.

Future research invites a full analysis of the application of environmental laws to each of these circumstances. This report, however, takes the initial step of identifying provisions of laws that may apply to homeland security incidents. This assessment is based on specific statutory language that affirmatively addresses wartime functions and interpretations of potential applications. It establishes a framework for future analysis of the environmental law provisions that may: help prevent harm to natural resources and human health from the response action to a terrorist event; establish liability for terrorists who intentionally release weaponized biological and chemical agents; control the production of weaponized biological and chemical agents; and govern the interaction between the government and the public regarding homeland security. This section will assist in the education of environmental lawyers by clarifying the nexus between their work and homeland security. It will also facilitate the drafting of new measures that can integrate homeland security with environmental authorities.

This report is not intended to provide an exhaustive assessment of all environmental laws; rather, its purpose is to highlight potentially relevant provisions that are likely to be invoked following breaches of homeland security. Full discussion of these authorities is beyond the scope of this report. Further, the focus does not include the incidental release of potential weaponized agents, such as biological or chemical contaminants, nor the policy implications of systemic government responses to acts of terrorism.

The potentially applicable environmental statutes and provisions presented below are categorized according to focus of the law, and include a statement of their potential applicability to homeland security issues. The focus can be categorized as: 1) control of substances and preventing their misuse; 2) prospective review of specific government actions or policies; 3) remediation and response to incidents; 4) natural resource protection; and 5) access to information. The following table depicts that relationship between type of security action and focus of the law. The relevant laws are identified below, along with a statement of their potential applicability to homeland security issues, and presented by category.

TABLE 1: THE RELATIONSHIP BETWEEN TYPE OF SECURITY ACTION AND FOCUS OF THE LAW.

LAW	FOCUS OF LAW					TYPE OF HOMELAND SECURITY ACTION			
	Natural Resource Protection	Control of Substances and Preventing Their Misuse	Prospective Review of Specific Government Actions or Policies	Remediation and Response to Incidents	Access to Information	Act of Terrorism	Site Specific Response Action	Systemic Responses to Homeland Security	Weaponized Agents
Safe Drinking Water Act (SDWA)	☑					☑		☑	☑
Federal Water Pollution Control Act ("Clean Water Act")	☑					☑		☑	☑
Toxic Substances Control Act (TSCA)		☑							☑
National Environmental Policy Act (NEPA)			☑					☑	
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)				☑			☑		
Resource Conservation and Recovery Act (RCRA)				☑			☑	☑	☑
Emergency Planning and Community Right-to-Know Act (EPCRA)					☑			☑	
Freedom of Information Act (FOIA)					☑			☑	

SUBSTANCE CONTROL

Toxic Substances Control Act, 15 U.S.C. §§ 2601-2692

The Toxics Substances Control Act (TSCA) addresses the risks to health and the environment from existing and new chemical substances. It is the stated policy of TSCA that there be "adequate authority" to regulate chemical substances that present an "unreasonable risk of injury to health or the environment." 15 U.S.C. § 2601(b)(2). TSCA establishes a framework for identifying potentially harmful chemical substances and regulating their use through a variety of regulatory tools. These tools include screening of new chemical substances, testing of existing substances, and placing restrictions or activities involving substances that present "unreasonable" health or environmental risks. TSCA creates opportunities to incorporate considerations of homeland security and drinking water safety into decision-making processes regarding specific chemical substances that may become weaponized for terrorist actions, even prior to such use.

Testing Requirements

Section 15 U.S.C. §2603(a), TSCA §4(a) provides that the U.S. EPA Administrator shall by rule require manufacturers and processors to test certain substances to develop data relevant to whether the substances present an unreasonable risk of injury to health or the environment. Section 15 U.S.C. §2603(b), TSCA §4(b) sets out guidelines for such rules.

This provision may be relevant to homeland security and drinking water because it empowers the U.S. EPA Administrator to require the producers and processors of certain substances to test, report, and otherwise determine that such substances do not present an unreasonable risk of injury to health or the environment. To the extent that weaponized agents or their precursors are governed by this provision, they may be subject to testing. A foundational

issue is whether chemical agents that have the potential to be weaponized are considered not to pose "an unreasonable risk."

Section 15 U.S.C. §2603(f), TSCA §4(f) provides that on receiving test data or other information indicating that there may be a reasonable basis to conclude that a substance presents significant risk of serious or widespread harm to human beings from cancer, gene mutations, or birth defects, the administrator shall initiate appropriate actions, which may include requiring premanufacture or processing notices (see below), promulgating regulations concerning the distribution and handling of the substance, or commencing a civil action to obtain the relief necessary to address an imminent hazard, as discussed below.

This provision may be relevant to homeland security and drinking water because it raises the issue of other harms that may result from chemical agents that have the potential to be weaponized, and the possibility that these agents may pose an unreasonable risk to health and the environment.

Premanufacture and Processing Notices

Section 15 U.S.C. §2604, TSCA §5 provides that manufacturers and processors of new substances, or substances that will be applied to significant new uses, must first notify the U.S. EPA Administrator that they intend to manufacture or process the substance and must then submit the data from any required testing. If no testing is required, they must submit data showing that the new substance or significant new use will not present an unreasonable risk of injury to health or the environment.

This provision may be relevant to homeland security and drinking water because it obligates manufacturers and processors to give notice to the administrator in advance of production of new substances or assigning new uses to such substances. Such substances or alternative uses may be interpreted to include weaponized agents or their precursors that may threaten drinking water supplies.

Concerning substances for which information is insufficient, Section 15 U.S.C. §2604(e)(1)(A), TSCA §5(e)(1)(A) provides that the administrator may, pending development of relevant data, issue a proposed order to restrict manufacture or use of substances for which information is insufficient pending development of further information.

This provision may be relevant to homeland security and drinking water because it gives the Administrator the discretion to restrict manufacture or use until further information regarding the substance, including its effect upon health and environment, is furnished. As a precautionary measure, it can address weaponized chemical agents that may adversely affect the safety of the drinking water supply.

Regulation of Hazardous Chemical Substances and Mixtures

Section 15 U.S.C. §2605, TSCA §6 provides that in the case of a substance that presents an unreasonable risk of injury to health or the environment, the administrator is authorized to prohibit or limit manufacture or processing, to require certain labeling and record keeping by manufacturers or processors, and to regulate the use or disposal of the substance.

This provision may be relevant to homeland security and drinking water because it empowers the administrator to ban or curtail the production or processing of hazardous substances. It further enables the administrator to require manufacturers and processors to label and keep track of such substances, including those that may be weaponized chemical agents that threaten drinking water supplies.

Imminent Hazards

In the case of an imminently hazardous substance, Section 15 U.S.C. §2606, TSCA §7 provides that the administrator may commence a civil action in U.S. district court for seizure of the substance and other appropriate relief, including mandatory notification, recall, and repurchase of the substance by the manufacturers, processors, or distributors.

This provision may be relevant to homeland security and drinking water because it gives the administrator the discretion to initiate a civil suit for the seizure of hazardous substances that pose an immediate threat, including those hazardous substances that may be weaponized chemical agents that may threaten the drinking water supply.

Reporting and Retention of Information

Section 15 U.S.C. §2607(b), TSCA §8(b) provides that the administrator shall compile, keep current, and publish a list of each chemical substance manufactured or processed in the United States.

This provision may be relevant to homeland security and drinking water because it places a duty upon the administrator to track all chemical substances, including those that may be weaponized chemical agents, and that, when improperly used, discharged or disposed, may threaten the drinking water supply.

Enforcement

Section 15 U.S.C. §§2614, 2615, 2616(a), 2617, TSCA §§15, 16, 17(a), and 19 provide for civil and criminal penalties for violations.

These provisions may be relevant to homeland security and drinking water safety because, to the extent that weaponized chemical agents are governed by the Act, a terrorist may be held liable for civil and criminal penalties for violating the act.

Section 15 U.S.C. §2616(b), TSCA §17(b) provides that substances produced in violation of the Act may be seized.

This provision may be relevant to homeland security and drinking water safety to the extent that the seizure of illegally produced substances involves weaponized chemical agents.

REVIEW OF GOVERNMENT ACTIONS

National Environmental Policy Act (NEPA), 42 U.S.C. §§4321-4370d

The National Environmental Policy Act (NEPA) sets forth a national environmental policy that serves as a "charter for protection of the environment." (40 C.F.R. s 1500.1). It establishes a process by which the federal government must evaluate the environmental impacts of any major actions that it plans to take. NEPA establishes the environmental impact statement procedure and a number of other administrative mechanisms to implement this policy. Based on its evaluation, the government should choose the federal action that will have the least impact on the environment while achieving its intended goal. The responsibility to prepare an environmental impact statement under NEPA lies with the federal government. States do not have a decision-making role, even though their views are solicited in the process. NEPA creates opportunities for federal agencies to incorporate considerations of homeland security and drinking water safety into their decision-making processes for government programs or projects developed as a systemic response to homeland security needs that may significantly affect the quality of the environment.

Purpose

Section 42 U.S.C. §4331(a), NEPA §101(a) provides that the federal government, in cooperation with state and local governments and other concerned public and private organizations, shall use all practical means to foster and promote the general welfare; develop conditions for the harmonious coexistence of people and nature; and fulfill the social, economic, and other requirements of present and future generations of Americans. This provision has been held to be judicially unenforceable.

This provision may be relevant to homeland security and drinking water safety because it places a duty on all levels of government to cooperate in fostering and promoting the general welfare and in securing other benefits —including matters of homeland security. Since public health concerns are placed under the rubric of the general welfare scheme, which includes drinking water safety, this provision can apply to drinking water security.

Section 42 U.S.C. §4332(2)(A), NEPA §102(2)(A) provides that federal agencies shall use a systematic interdisciplinary approach in making decisions that may affect the environment.

This provision may be relevant to homeland security and drinking water safety because it places a duty upon the separate federal agencies to cooperate and to apply their separate areas of expertise to the fullest extent when making determinations that affect the environment. Homeland security actions by federal government involving surface or ground water that serves as a source of drinking water may invoke application of this provision.

Section 42 U.S.C. §4332(2)(C), NEPA § 102(2)(C) requires each federal agency to include in recommendations and reports on "proposals for legislation and other major Federal actions significantly affecting the quality of the environment" a "detailed statement" covering the following: the environmental impact of the proposed action; any adverse environmental effects that cannot be avoided should the proposal be implemented; alternatives to the proposed action; the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and any irreversible and irretrievable commitments of resources that would be involved in the implementation of the proposed action should it be implemented.

This provision may be relevant to homeland security and drinking water safety because major federal actions taken in response to drinking water security may significantly affect the quality of the environment. The preparation of an environmental impact statement for such actions may help clarify the alternatives, prevent adverse environmental effects, and deter irreversible and irretrievable commitments of resources.

REMEDIATION AND RESPONSE TO INCIDENTS

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT, AS AMENDED ("SUPERFUND"), 42 U.S.C. §§9601-9675

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) was enacted to address the cleanup of sites where hazardous substances have been released into the environment or where there is a substantial threat that hazardous substances will be released into the environment. The statute authorizes U.S. EPA to clean up and take actions to prevent releases of hazardous substances and to recover costs from parties who may be responsible for the release or threatened release. U.S. EPA may also require the parties responsible for the release or threat of release to take the necessary cleanup actions. The statute also creates a federal revolving fund to help finance site cleanup. CERCLA creates opportunities to incorporate considerations of homeland security and drinking water safety into decision-making regarding site-specific action taken in response to a terrorist event, such as remediation or cost recovery for soil or ground water contaminated with weaponized agents.

Response Authorities

Section 42 U.S.C. §9604(a), CERCLA §104(a)(1) provides that when a hazardous substance or a pollutant that may present an imminent and substantial danger to the public health or welfare is released or about to be released, the President may remove such substance, provide for long-term remedial action, or take any other action necessary to protect the public health or welfare or the environment. The President may, under such circumstances, allow the responsible party to carry out the response action.

This provision may be relevant to homeland security and drinking water safety because it empowers the President to act to mitigate, remove or take any action necessary to protect public health or welfare when a hazardous substance or pollutant that may present immediate and significant danger is released. To the extent that weaponized biological or chemical contaminants impact or are about to impact a drinking water supply, this provision could be interpreted to apply.

Section 42 U.S.C. §9604(e)(2), CERCLA §104(e)(2) provides that representatives of the federal government or state governments with cooperative agreements may require persons who handle hazardous substances to furnish information concerning the ability of such persons to pay for or to perform a cleanup.

This provision may be relevant to homeland security and drinking water safety because it furnishes federal and state representatives with the discretionary power to require the persons who handle hazardous substances, arguably including weaponized biological and chemical agents that may be released and impact threaten drinking water supplies, to pay for or to actually perform the cleanup.

Section 42 U.S.C. §9604(e)(3), CERCLA §104(e)(3) & (4) provides that if there is a reasonable basis to believe that there may be a release or threatened release of a hazardous substance, the governmental representative is authorized to enter the facility in question for inspection and sampling.

This provision may be relevant to homeland security and drinking water safety because it empowers governmental officials to enter a polluting facility for the purposes of ascertaining the facility's connection to the release of a hazardous substance (arguably including a weaponized biological and or chemical agent that may be released and threaten drinking water supplies) that has occurred.

National Contingency Plan (NCP)

Section 42 U.S.C. §9605(a), CERCLA §105(a) establishes the minimum requirements of the hazardous substance response plan, including methods of determining priorities among releases. Priorities shall be based upon relative risk or danger to public health or welfare or the environment. Section 42 U.S.C. §9605(a)(8)(B), CERCLA §105(a)(8)(B) provides that the President shall list catalogue releases in order of their priority on the National Priorities List (NPL).

This provision may be relevant to homeland security and drinking water safety because acts of terrorism that involve releases of biological or chemical agents into the environment and that impact drinking water resources may be determined to rank among the top priorities of the NPL.

Section 42 U.S.C. §9605(d), CERCLA §105(d) provides that any person affected by a release may petition the President to conduct a preliminary assessment of the release's hazards. If the release may pose a threat to human health or the environment, the President shall determine the national priority of the release.

This provision may be relevant to homeland security and drinking water safety because it empowers any affected individual to request the President to assess the threat level of a pollutant that has been released. Again, acts of terrorism involving the release of weaponized biological and chemical agents threatening drinking water resources may be determined to rank among the top pri-

orities of the NPL. The provision does not address the right to petition by those persons that may potentially be affected by the release.

Abatement Actions

Section 42 U.S.C. §9606(a), CERCLA §106(a) provides that when the President determines that there may be an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release, he may require the Attorney General to secure such relief as necessary to abate the danger. The President may also take other action, such as issuing orders as necessary to protect the public health and welfare and the environment.

This provision may be relevant to homeland security and drinking water safety because it gives the President the discretion to direct the Attorney General, and thus the Justice Department, to act with the goal of mitigating or ending a danger involving the release of a weaponized biological or chemical agent in a manner that impacts drinking water resources.

This provision may also be interpreted to give the President plenary power to take other actions as necessary to protect public health and welfare as well as the environment from the release of a weaponized biological and chemical agent that may impact drinking water resources.

Liability

Section 42 U.S.C. §9607(a), CERCLA §107(a) provides that owners and operators of facilities at which hazardous substances are located, persons who arrange for the disposal of hazardous substances, and persons who accept hazardous substances for transport to disposal and treatment facilities shall be liable for response costs incurred by the government consistent with NCP. Such persons shall also be liable for any other necessary response costs incurred by any other person consistent with the National Contingency Plan, natural resource damages (liability shall be to the government), and the costs of certain health assessments or studies.

These two provisions combined may be relevant to homeland security and drinking water safety because they establish both direct liability and vicarious liability for persons who manage and handle hazardous substances, which could be interpreted to include weaponized biological and chemical agents that impact drinking water resources.

Citizen Suits

Section 42 U.S.C. §9659, CERCLA §310 provides that any person may bring a citizen suit against alleged violators or the President.

This provision may be relevant to homeland security and drinking water because it empowers ordinary citizens to bring suit against alleged violators or the President for violations involving weaponized biological and chemical agents that endanger drinking water resources.

Resource Conservation and Recovery Act, 42 U.S.C. §§6901-6992k, Hazardous Waste Management (Subtitle C)

The Resource Conservation and Recovery Act (RCRA) regulates the management and disposal of hazardous and non-hazardous solid waste. Subtitle C of the statute establishes a complex system designed to manage hazardous waste from its creation, through its transportation, to its ultimate disposal. Subtitle D addresses non-hazardous waste (primarily municipal waste), underground storage tanks, used oil, and medical waste, with primary responsibility for implementation resting with the states. It requires states to develop state or regional solid waste plans to manage disposal and also requires U.S. EPA to develop technical construction standards for "sanitary landfills"—facilities that accept solid waste for treatment and disposal. RCRA creates opportunities to incorporate considerations of homeland security and drinking water safety into decision-making regarding site specific actions taken in response to a terrorist event, such as the remediation of soil contaminated with a weaponized agent that is defined as a hazardous waste. Additional opportunities may arise in decision-making regarding government programs developed as a systemic response to homeland security needs, such as U.S. EPA's technical construction standards for sanitary landfills that accept waste generated through a terrorist event.

"Hazardous Waste" and "Solid Waste"

Section 42 U.S.C. §6903(5), RCRA §1004(5) defines "hazardous waste" as solid waste that is potentially dangerous to human health or the environment.

This provision may be relevant to homeland security and drinking water safety because it furnishes a legal definition for the type of waste that poses potential risk for human health or the environment. Weaponized agents may be interpreted to be hazardous waste to the extent that they are released into the environment and require remediation following a terrorist incident.

Section 42 U.S.C. §6921(a), (b), RCRA §3001(a), (b) requires U.S. EPA to determine which hazardous wastes should be subject to Subtitle C of the act by identifying hazardous waste characteristics and by listing specific substances as hazardous wastes. In determining these characteristics, U.S. EPA must consider their toxicity, persistence, degradability in nature, potential for accumulation in tissue, flammability, and corrosiveness.

This provision may be relevant to homeland security and drinking water safety because it places U.S. EPA under the duty to analyze and identify specifically the substances that are hazardous waste and thus potentially dangerous to human health or the environment. This "characteristics" analysis may be particularly useful for homeland security, because it does not depend on Congressional authorization or the existence of a predetermined list of wastes. Instead, it gives U.S. EPA the flexibility to focus on different aspects and different kinds of health hazards as they arise—which is likely to be a scheme that is particularly suited to addressing the use of weaponized chemical and biological agents.

Land Disposal Restrictions

Section 42 U.S.C. §6924(c), RCRA §3004(c) prohibits placement of bulk or noncontainerized liquid hazardous wastes in landfills, and generally bans placement of liquids that are not hazardous waste in hazardous waste landfills. Section 42 U.S.C. §6924(d), (e), RCRA §3004(d), (e) also bans land disposal of certain wastes absent an administrative determination that banning a method of land disposal is not necessary after a demonstration that there will be no migration of hazardous constituents from the disposal unit for as long as the waste remains hazardous. Section 42 U.S.C. §6924(f), RCRA §3004(f) requires EPA to ban disposal of certain wastes by deep injection into underground wells if it may be reasonably determined that such disposal may not be protective of human health and the environment for as long as the waste remains hazardous.

These provisions may be relevant to homeland security and drinking water safety to the extent that the waste contains weaponized biological and chemical agents that may be subject to the land bans.

Section 42 U.S.C. §6924(g), RCRA §3004(g) requires EPA to submit a schedule for making land disposal determinations for characteristic and listed hazardous wastes. Exemptions from some land disposal and underground injection requirements can be obtained if the waste is treated and discharged pursuant to a national pollutant discharge elimination system (NPDES) permit or is pretreated pursuant to the Federal Water Pollution Control Act. Section 42 U.S.C. §6924(h), RCRA §3004(h) authorizes EPA to establish certain variances from land disposal prohibitions.

These provisions may be relevant to homeland security and drinking water safety to the extent that the waste contains weaponized biological and chemical agents that may be subject to exemptions and variances.

Section 42 U.S.C. §6924(j), RCRA §3004(j) prohibits storage of hazardous wastes that are prohibited from land disposal unless such storage is for the sole purpose of accumulating enough waste to recover, treat, or dispose of it properly. Section 42 U.S.C. §6924(m), RCRA §3004(m) requires EPA to promulgate treatment standards for wastes subject to land disposal restrictions and provides that hazardous wastes that have been treated to such standards may be disposed of in a land disposal facility.

These provisions may be relevant to homeland security and drinking water safety because the prohibition on the storage of hazardous waste may be interpreted to include weaponized biological and chemical wastes in any manner that could threaten drinking water supplies.

Enforcement

Section 42 U.S.C. §6928(a), RCRA §3008(a) provides that if U.S. EPA determines that a person has violated Subtitle C, the agency may issue orders assessing civil penalties and requiring compliance, or it may commence a civil action in U.S. district court. Section 42 U.S.C. §6928(d), RCRA §3008(d) stipulates that anyone knowingly transporting hazardous waste to an unpermitted facility or knowingly treating, storing, or disposing of hazardous waste without a permit or in violation of a permit or interim status regulations is subject to criminal fines and imprisonment. Section 42 U.S.C. §6928(e), RCRA §3008(e) provides that anyone who knowingly commits any such act and thereby places another person in imminent danger of death or serious bodily injury is subject to additional criminal fines and imprisonment.

These provisions may be relevant to homeland security and drinking water safety because they establish the civil and criminal liabilities for persons who violate the Act, which may be interpreted to include acts involving weaponized biological and chemical wastes that impact drinking water.

U.S. EPA "Imminent and Substantial Endangerment" Suits

Section 42 U.S.C. §6973(a), RCRA §7003(a) provides that U.S. EPA may bring suit against any person who has contributed or is contributing to the handling, storage, treatment, transportation, or disposal of any solid

or hazardous waste that may present an imminent and substantial endangerment to health or the environment.

This provision may be relevant to homeland security and drinking water safety because it gives U.S. EPA the discretion to sue anyone who handles hazardous waste in a manner that does or may present an immediate and significant danger to health or the environment. The provision may be interpreted to include weaponized biological and chemical agents that impact threaten drinking water.

NATURAL RESOURCE PROTECTION

Federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. §§1251-1387

The Federal Water Pollution Control Act (CWA or Clean Water Act) governs the quality of surface water—rivers and streams. It establishes national, technology-based standards for municipal waste treatment and numerous categories of industrial "point source" discharges (discharges from fixed sources such as pipes and ditches); requires states, and in some cases tribes, to enact and implement water quality standards to attain designated water-body uses; addresses toxic water pollutants; and regulates dredge-and-fill activity and wetlands. The statute also applies these requirements to federal facilities, such as military installations or Department of Energy sites. The CWA creates opportunities to incorporate considerations of homeland security and drinking water safety into decision-making regarding the act of terrorism itself, such as the release of biological, chemical, and radioactive substances that have become weaponized. Additional opportunities arise during decision-making regarding government programs developed as a systemic response to homeland security needs, such as consideration of weaponized agents in the development of technology-based standards.

Prohibitions on Discharges into Waters of the United States

Section 33 U.S.C. §1311(a), FWPCA §301(a) provides that "except as permitted by the Act, the discharge of any pollutant by any person is unlawful."

This broad prohibition on discharges of any pollutant into the waters of the United States may guide response to the release of a weaponized agent by making illegal the introduction of any pollutant into bodies of water, including those *surface* waters that serve as drinking water supplies.

Section 33 U.S.C. §1311(f), FWPCA §301(f) provides " [I]t is unlawful to discharge into navigable waters any radiological, chemical, or biological warfare agent; high-level radioactive waste; or medical waste."

This provision is a direct link to warfare agents and constitutes a broad prohibition against the discharging of specific types of pollutants, especially those of particular concern to homeland security, into navigable waters, which may include those that serve as or feed into drinking water supplies.

New Source Performance Standards

Section 33 U.S.C. §1316(b)(1)(B), FWPCA §306(b)(1)(B), provides that "The Administrator shall propose and publish regulations establishing federal standards of performance for new sources."

This provision may be relevant to homeland security and drinking water safety because it places the Administrator under the obligation to determine, in light of public health concerns, the tolerable levels of contamination of water, including drinking water supplies, from new sources with regard to health and safety. To the extent that the government wants to use environmental laws as an additional tool to address the consequences of terrorist activities, standards could be set for biological and chemical agents likely to be weaponized. The provision also places a reporting burden upon the administrator once such determinations are made.

Toxic and Pretreatment Effluent Standards

Section 33 U.S.C. §1316(b)(1)(B), FWPCA §306(b)(1)(B), provides that the administrator shall identify toxic pollutants for which the application of Best Available Technology (BAT) is required. Section 33 U.S.C. §1317(a), FWPCA §307(a) provides that "The Administrator shall take into consideration a pollutant's toxicity, persistence, and degradability; the presence and importance of affected organisms; and the nature of the pollutant's effects on such organisms."

These provisions may be relevant to homeland security and drinking water safety because they impose upon the administrator the duty to assess and identify those water pollutants that are potentially harmful to health and safety. The administrator must then categorize those pollutants as to which the best available technology must be applied to mitigate and/or remove these substances from the affected water supply. To the extent that the government wants to use environmental laws as an additional tool to address the consequences of terrorist activities, it could apply the best available technology requirements.

Section 33 U.S.C. §1317(a), FWPCA §307(a) states that the "Administrator may establish an effluent standard

imposing additional requirements on dischargers of a toxic pollutant."

This provision may be relevant to homeland security and drinking water safety because it vests the administrator with the discretion to further protect water supplies by broadening the restrictions on the legal discharging of toxic pollutants into water supplies. Those restrictions may serve as the baseline definition for legal discharges of weaponized biological and chemical agents.

Section 33 U.S.C. §1317(b), FWPCA §307(b) states that the "Administrator shall promulgate pretreatment standards for the introduction of pollutants into publicly owned treatment works (POTWs) for those pollutants not susceptible to treatment by the POTWs or those that would interfere with the operation of such treatment works."

This provision may be relevant to homeland security and drinking water safety because it empowers the administrator to establish standards that will result in mandatory additional processes for treating those pollutants that would be difficult or impossible to treat in the standard processes applied by publicly-owned treatment works. To the extent that weaponized biological and chemical agents are deemed likely to enter POTWs, this provision could be utilized to address terrorist actions.

Oil and Hazardous Substance Liability

Section 33 U.S.C. §1321(b)(1), FWPCA §311(b)(1) states that

> It is the policy of the United States that there should be no discharges of hazardous substances into navigable or territorial waters.

This provision may be relevant to homeland security and drinking water because it is a broad prohibition against the discharge of hazardous substances of any type into navigable or territorial waters, which may include those that serve as or that may feed into drinking water supplies. These substances may include weaponized agents used in terrorist actions.

Section 33 U.S.C. §1321(b)(2), FWPCA §311(b)(2) states that "the Administrator shall develop a list of hazardous substances other than oil that present an imminent and substantial danger to the public health or welfare."

This provision may be relevant to homeland security and drinking water safety because it imposes a duty upon the administrator to identify, and presumably keep current, a comprehensive list of hazardous substances other than oil that pose immediate and significant danger to public health and welfare. These substances may include weaponized agents used in terrorist actions.

Section U.S.C. §1321(b)(3), FWPCA §311(b)(3) states that the "discharge of such hazardous substances in quantities determined by the President to be harmful is generally prohibited."

This provision may be relevant to homeland security and drinking water safety because it vests the President with the power to determine the level of quantities of the identified hazardous substances that are harmful and places a prohibition upon discharges of such substances above the levels determined. These substances may include weaponized agents used in terrorist actions.

Section 33 U.S.C. §1321(b)(5), FWPCA §311(b)(5) states that "Any person in charge of a vessel or facility must, as soon as that person has knowledge of any unlawful discharge of oil or hazardous substance, notify the federal government. Failure to notify is a criminal offense."

This provision may be relevant to homeland security and drinking water safety because it criminalizes the failure, either through negligence or intent, of the top ranking officer of a vessel or facility to notify federal authorities of any unlawful discharge of oil or a hazardous substance that has occurred. The provision does not hold the top ranking official liable from the time when the discharge has occurred, but from the time that the ranking official has knowledge that the discharge has occurred. These substances may include weaponized agents used in terrorist actions.

Section 33 U.S.C. §1321(b)(7)(A), FWPCA §311(b)(7)(A) states that "Owners or operators of vessels and facilities shall be assessed civil penalties for unlawful discharges."

This provision may be relevant to homeland security and drinking water safety because it may serve as a strict liability provision designed to hold either owners or operators, presumably to be determined on a case-by-case basis, responsible for any discharges that occur. The discharges may involve weaponized agents used in terrorist actions.

Imminent and Substantial Endangerment

Section 33 U.S.C. §1364(a), FWPCA §504(a), provides that "Where the Administrator receives notice that a pollution source is presenting an imminent and substantial endangerment to human health or livelihood, the administrator may sue for immediate restraint of anyone causing or contributing to the pollution, or take any other action necessary."

This provision may be relevant to homeland security and drinking water safety because it empowers the Administrator to seek an injunction or temporary restraining order, or to take any other action necessary against the person responsible to prevent the continuance

of the pollution that is posing imminent and substantial danger to human health or occupation. This provision also allows the Administrator to act against the person contributing to the pollution, causing it to become an imminent and substantial endangerment to health and livelihood, as well as the person responsible for the pollution reaching such a level. It also may provide authority to respond to an emergency involving the release of a weaponized agent into surface waters serving as a source of drinking water.

Section 33 U.S.C. §1365(a), FWPCA §505(a), states that "Any person may bring a citizen suit against alleged violators or the Administrator."

This provision may be relevant to homeland security and drinking water safety because it empowers ordinary citizens to bring suit against polluters or the administrator if any or all fail to act. A citizen affected by the release or discharge of a biological or chemical agent used in a terrorist incident may choose to exercise this authority to encourage a response action.

Federal Facilities

Section 33 U.S.C. §1323, FWPCA §313, provides that "Federal facilities shall comply with all federal, state, interstate, and local laws respecting the control and abatement of water pollution, although the President may grant exemptions."

This provision may be relevant to homeland security and drinking water security because it raises the issue of whether federal agencies involved in homeland security measures that result in the release of a weaponized agent must comply with applicable water pollution control laws. It also signals the need to assess what states have done to protect their waters (including drinking water sources). The provision also calls for an appraisal of exemptions that have been granted and the effect they may have upon drinking water supplies. This provision may be interpreted to apply to the activities of federal military installations, which may include response to or cleanup of a terrorist incident, and which may, under the name of "counter terrorism," include engaging in chemical or biological research.

Safe Drinking Water Act, 42 U.S.C. §§300f-300j-26

In response to the events of September 11th, Congress responded to the urgent need to protect the nation's drinking water supplies by amending the Safe Drinking Water Act (SDWA) through the Public Health Security and Bioterrorism Preparedness and Response Act. In addition to the increased authority provided in the amendments, the general provisions of the SDWA also contain provisions that provide the basis for drinking water security. This protection is achieved through two principal programs: (1) regulating public water systems and the quality of water they provide for human consumption; and (2) protecting underground sources of drinking water from contamination. To regulate the quality of public drinking water, U.S. EPA has established national primary and secondary drinking water standards. The Act provides for states to receive authorization from U.S. EPA to administer the safe drinking water program within its boundaries. The SDWA's program to protect underground sources of drinking water primarily focuses on underground injection of fluids, including hazardous, municipal, and industrial waste.

The Act's broad governance over public water supply systems provides the foundation for promoting security of drinking water. As discussed in Section 2 on federal authorities, SDWA has been amended to specifically address drinking water protection for homeland security. Beyond the specific homeland security authorities found in these amendments, the SDWA provides additional opportunities to incorporate consideration of homeland security and drinking water safety into decision-making. These opportunities relate to an act of terrorism, such as the release of a biological, chemical or radioactive agent into an underground source of drinking water through an injection well. They also include government programs developed as a systemic response to homeland security needs, such as development of a drinking water standard for weaponized biological, chemical or radioactive agents to serve as a baseline for monitoring and treatment for public water supply systems.

Public Water Systems (PWS)

Section 42 U.S.C. §300g-1(b)(1)(A), SDWA §1412(b)(1)(A) provides that the "Administrator of EPA shall publish maximum contaminant level goals (MCLGs) and promulgate national primary drinking water regulations (NPDWRs) for certain designated contaminants that may have an adverse effect on health, are likely to occur in the PWS, and the regulation of which presents a meaningful opportunity to reduce health risks."

This provision may be relevant to homeland security and drinking water because it empowers the Administrator to establish the ceiling for contaminant level goals, which are aspirational, and to establish at the federal level drinking water regulations, which lay the floor for state standards for drinking water contaminants. The potential relevance to homeland security concerns whether additional standards are needed to address the release into drinking water of weaponized biological and

chemical agents that may adversely affect human health. An additional issue is whether there is any legal consequence for the release of a weaponized agent into drinking water for which no standard exists.

Section 42 U.S.C. §300g-1(b)(4)(A), SDWA §1412(b)(4)(A) provides that "each MCLG shall be at the level at which there are no known or anticipated adverse effects on the health of persons and that allows an adequate margin of safety."

The potential relevance to homeland security is in what manner can weaponized biological and chemical agents that may be released into drinking water be regulated to provide an adequate margin of safety.

Section 42 U.S.C. §300g-1(b)(4)(B), SDWA §1412(b)(4)(B) provides that "each NPDWR shall specify a maximum contaminant level (MCL) that is as close as feasible to the MCLG," and Section 42 U.S.C. §300g-1(b)(4)(D), SDWA §1412(b)(4)(D) defines "feasible" to mean the use of the best technology, treatment techniques, and other methods that the Administrator finds are available, taking cost into consideration.

This provision may be relevant to homeland security and drinking water security to the extent that "feasibility" and "similar cost considerations" must be considered in the development of acceptable standards for the release of weaponized biological and chemical agents into drinking water.

Section 42 U.S.C. §300g-1(b)(3)(C), SDWA §1412(b)(3)(C) provides that when proposing an NPDWR that includes an MCL, the administrator is required to analyze the risk-reduction costs and benefits associated with the proposed drinking water standard to determine whether the benefits justify the costs.

This provision is relevant to homeland security and drinking water safety to the extent that risk-reduction costs and benefits associated with the proposed drinking water standard must be considered in the development of standards for the release of weaponized biological and chemical agents into drinking water.

Section 42 U.S.C. §300g-1(b)(1)(B) & (C), SDWA §1412(b)(1)(B) & (C) provides that the administrator shall publish a list of contaminants not subject to an NPDWR that are known or anticipated to occur in the PWS and may require regulation due to public health concerns. Section 42 U.S.C. §300g-1(b)(1)(B), SDWA §1412(b)(1)(B) provides that every five years, the administrator will determine if any of the listed contaminants require regulation.

This provision is relevant to homeland security and drinking water because it provides the opportunity for the administrator to address potential weaponized biological and chemical agents that may be among those anticipated to occur in the PWS and that therefore require regulation.

Section 42 U.S.C. §300g-4(e), SDWA §1415(e) provides that states exercising primary enforcement may grant an MCL or treatment technique small-system variance to PWSs that serve 3,300 or fewer people. Section 42 U.S.C. §300g-4(e), SDWA §1415(e) provides that the Administrator of EPA can issue a small-system variance to a PWS serving fewer than 10,000 people. Section 42 U.S.C. §300g-4(e), 300g-1(b)(15), SDWA §1415(e) and 1412(b)(15) provides that a small-system variance is available where variance technology exists and a PWS cannot afford to comply with an NPDWR.

These provisions may be relevant to homeland security and drinking water safety to the extent that such variances may be sought by small water supply systems that may be threatened by acts of terrorism, and they raise the question of whether an adequate level of protection can be maintained.

Protection of Underground Sources of Drinking Water

Section 42 U.S.C. §300h(a)(1), SDWA §1421(a)(1) provides that the U.S. Administrator shall promulgate regulations for state underground injection control (UIC) programs. Section 42 U.S.C. §300h(b)(1), SDWA §1421(b)(1) provides that such regulations shall contain minimum requirements for effective programs to prevent underground injection that endangers drinking water sources, including requirements for a permit system for underground injection.

These provisions may be relevant to homeland security and drinking water to the extent that injected fluids contain weaponized biological and chemical agents. Fluids may come into contact with weaponized agents through releases into municipal effluent that are then injected into underground sources of drinking water or into surface waters that become the source water for aquifer storage and recovery. A potentially relevant issue is whether weaponized biological and chemical agents should be included in minimum standards that are to be incorporated into programs designed to prevent endangerment of underground sources of drinking water.

State Wellhead Protection Programs

Section 42 U.S.C. §300h-7(a), (d), (e), SDWA §1412(a), (d), (e) provides that states are to establish programs to protect wellhead areas (i.e. the surface and subsurface areas surrounding water wells or wellfields supplying a PWS) from contamination that may have an adverse effect on human health. The act establishes the minimum

requirements of such programs and authorizes federal assistance for their development and implementation.

These provisions may be relevant to homeland security and drinking water safety because they place a duty upon the states to protect those locations that may potentially pose a risk for introduction of contaminants into drinking water supplies. These areas in fact may be of significant vulnerability to terrorist attack. Further, the provision establishing the floor for the design scheme to which states must adhere in constructing their wellhead area protection programs provides an opportunity to integrate models addressing water security. Finally, this provision provides an opportunity to establish functions that could be supplemented and supported by the Department of Homeland Security.

Source Water Protection

Section 42 U.S.C. §300j-13, SDWA §1453 establishes EPA's Source Water Assessment and Protection Programs. Section 1453 requires EPA to develop guidance for states with primary enforcement responsibility to carry out a source water assessment program. The Act provides that states exercising primary enforcement responsibility must conduct source water quality assessments of and identify the contamination threats at all PWS drinking water sources. The purpose of such programs is to identify areas that supply drinking water within the state and determine the extent to which the public water systems in those delineated areas are susceptible to contaminants. Program elements must address risk reduction (delineation and source inventories), risk ranking and screening (susceptibility analyses), risk management measures (prevention programs), and preparation for unexpected drinking water supply replacement emergencies (contingency planning).

This provision may be relevant to homeland security and drinking water safety because it provides a foundation for assessing the vulnerability of drinking water supplies to terrorist acts. It places a duty upon states exercising primary enforcement responsibility to monitor source water quality and all contamination threats to all PWS drinking water sources, which may include weaponized biological and chemical agents. As such, it encourages the implementation of measures to both prevent and abate contamination of drinking water sources from acts of terrorism.

Emergency Powers

Section 42 U.S.C. §300i(a), SDWA §1431(a) provides that upon receiving information that a contaminant of a PWS or underground water source may present an imminent and substantial endangerment to human health and that appropriate state and local authorities have not acted to protect human health, the administrator may take whatever action the administrator deems necessary.

This provision is of vital importance to homeland security because it empowers the administrator to supersede state and local authorities in the absence of adequate action to protect human health and allows the administrator to determine the actions necessary to address the emergency. A relevant issue is under what conditions it can be determined that state and local authorities have not acted to protect human health.

General Provisions

Section 42 U.S.C. §300j-4(a)(1), SDWA §1445(a)(1) provides that suppliers of water and others subject to the requirements of the Act may be required by the administrator to maintain records and conduct monitoring.

This provision may be relevant to homeland security and drinking water to the extent it could be used to require water suppliers and others to monitor weaponized biological and chemical agents that can adversely impact drinking water safety.

ACCESS TO INFORMATION

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA), 42 U.S.C. §§ 11001-11050

The Emergency Planning and Community Right-to-Know Act (EPCRA), enacted as Title III of the Superfund Amendments and Reauthorization Act of 1986, establishes programs that impose reporting requirements on owners and operators of certain facilities regarding the use, storage, and release of specific chemicals. These reports, with certain exceptions, are available to the public. EPCRA also requires state and local entities to take measures to prepare for chemical release emergencies, such as preparing emergency response plans.

Since the tragic events of September 11th, there has been considerable debate on the impact of EPCRA on homeland security with respect to the release of information to the public. There has also been recognition of the need to integrate emergency planning for both accidental and intentional releases of dangerous chemicals. While a full analysis of the relationship between EPCRA with respect to homeland security is beyond the scope of this report, the Act does create opportunities to incorporate considerations of homeland security and drinking water safety into decision-making regarding government programs developed as a systemic response to homeland security needs.

List of Extremely Hazardous Substances

Section 42 U.S.C. §11002(a), EPCRA §302 (a) requires the administrator to "publish a list of extremely hazardous substances, and threshold planning quantities for each substance on the list." Further, the administrator "may revise the list from time to time, taking into account the toxicity, reactivity, dispersability, combustibility, or flammability of the substance."

This provision may be relevant to homeland security and drinking water because substances on the list may include agents with the potential for weaponization and adverse impact on drinking water if released by a terrorist. This provision could be interpreted to authorize U.S. EPA to review and revise, as appropriate, its list of hazardous substances and their threshold quantities to include chemical agents capable of weaponization.

Emergency Planning and Notification

Section 42 USC §11003, EPCRA §303 requires each local emergency planning committee to "prepare an emergency response plan and review it annually."

This provision could be interpreted to facilitate consideration of homeland security and drinking water, including the emergency response plan for small public water supply systems, as part of the emergency plans.

Section 42 U.S.C. §11002(c), EPCRA §302(c) requires that the "owner or operator of each facility at which extremely hazardous substances are present in excess of the established threshold planning quantity shall notify the state emergency planning commission of the presence of such substances." Section 42 U.S.C. §11004(a), (b), EPCRA §303(a), (b) sets forth the circumstances under which a facility owner or operator shall immediately notify the local emergency planning committee and state emergency planning commission of the release of a substance.

These provisions may be relevant to homeland security and drinking water because the substances may include chemicals used in the treatment process for drinking water (e.g. chlorine) and may include chemicals with the potential for weaponization and use by terrorists. These provisions also invoke concerns with the release of sensitive information exposing vulnerabilities of drinking water.

Emergency and Hazardous Chemical Inventory Forms

Section 42 U.S.C. §11022(a), EPCRA §312(a) requires facilities required to prepare or maintain an material safety data sheet (MSDS) to "prepare and submit an emergency and hazardous chemical inventory form to the appropriate local emergency planning committee, state emergency planning response commission, and fire department with jurisdiction over the facility."

This provision may be relevant to homeland security and drinking water to the extent that the chemical agents covered by this provision have the potential for weaponization and adverse impact on drinking water if released by a terrorist.

Freedom of Information Act, 5 U.S.C. §§ 552-552a

The Freedom of Information Act (FOIA) provides a mechanism for members of the public to obtain important documents and other information from federal government agencies. The statute and court cases define the circumstances in which the government is entitled to keep documents from public view. Federal agencies are allowed to charge members of the public fees for copying relevant information, with an exception if disclosure of the information is in the public interest because it will likely contribute to public understanding of the operations and activities of the government. FOIA creates opportunities for federal agencies to incorporate considerations of homeland security and drinking water safety into decision-making regarding government programs or projects developed as a systemic response to homeland security needs. For example, as with EPCRA, FOIA invokes the need to consider the balance between disclosure and the release of sensitive information.

Records Request

Section 5 U.S.C. §552(a)(2) requires agencies to generally "make available for public inspection and copying their opinions and orders, statements of policy and interpretations, and administrative staff manuals and instructions, including indexes and supplements. These materials may only be relied on or cited as precedent against a party without actual notice if they have been indexed and either published or otherwise made available." Section 5 U.S.C. §552(a)(3) provides that "an agency shall promptly comply with proper requests for records not published or made available for public inspections."

These provisions may be relevant to homeland security and drinking water safety because they govern the release of information to the public that may include sensitive material that could increase the vulnerability of drinking water to terrorists events. Concurrently, some of the information can be useful to enable the public to contribute to increased security for drinking water.

Exemptions

Section 5 U.S.C. §552(b) provides that "Agency matters exempt from disclosure include matters relating to national defense or foreign policy, an agency's internal personnel rules, matters specifically exempted by statute, trade secrets and privileged or confidential commercial matters, inter- and intra- agency memoranda not available by law outside of litigation, personnel or medical files, records or documents compiled for law enforcement purposes to the extent disclosure could reasonably be expected to harm individuals or ongoing investigations, reports prepared by or for an agency regulating financial institutions, and geological or geophysical data concerning wells."

This provision is relevant to homeland security and drinking water because it authorizes the agency to withhold information that relates to national defense or foreign policy, which may include terrorist threats to drinking water.

AREAS FOR FUTURE RESEARCH

In addition to the aforementioned statutory provisions that may be relevant to homeland security and drinking water safety either through explicit language referencing homeland security or by interpretation, there remains an important need to conduct further research on the integration of environmental and homeland security authorities. This further analysis should address opportunities that are currently available through existing statutory provisions and also potential opportunities that would result from modifications of existing statutory provisions. The following list indicates the areas of research that may be in order.

Imminent and Substantial Endangerment

There is extensive caselaw under the major environmental statutes interpreting their common "imminent and substantial endangerment" language and delineating EPA's authority in such cases. These provisions may provide vital authorities necessary to respond to terrorist events that affect drinking water and other natural resources. Caselaw relevant to drinking water can be found most directly under the SDWA and CWA provisions. The CERCLA imminent danger provision is perhaps the most-used and best-defined imminent and substantial endangerment provision, and conclusions reached from an analysis of this provision would provide insight into other statutes that have similar provisions. Finally, a general discussion of the "imminent and substantial endangerment" language in other environmental statutes would clarify the scope of opportunity provided by such provisions to address terrorist events that impact drinking water.

Primary Enforcement and Delegation

Under certain environmental statutes, such as the laws governing air, water, and solid and hazardous wastes, states may secure decision-making authority through primacy or program delegation. Under this approach, key decisions about permits and approvals are made by the states. In addition, some environmental statutes, such as CERCLA, allow states to impose additional liability or requirements concerning the release of hazardous substances. To the extent that states have the discretion to pass more stringent laws addressing the release of hazardous substances, there may be opportunities on the state level to respond to the release of weaponized biological and chemical agents into drinking water and other natural resources. In addition, provisions that require a CERCLA cleanup to follow all applicable, relevant and appropriate rules may allow an entire body of existing law to be imported into homeland security related cleanups. An analysis of these provisions would clarify the relationship between homeland security and federal environmental laws implemented by state programs.

Federal Assistance Programs/Wellhead Protection

Federal assistance provisions, such as those provided in the Safe Drinking Water Act's Wellhead Protection Program, raise the question of whether some of these functions could be supplemented by the Department of Homeland Security, and the extent to which financial resources could be channeled into existing EPA programs. Given the emphasis on prevention by some of these programs, they could help address an urgent need within homeland security to supplement the law enforcement emphasis that is predominant in homeland security programs. An analysis of these provisions would promote synergy and economy of scale to ensure drinking water security.

Federal Facilities

Some environmental statutes include provisions that address federal facilities, such as section 33 U.S.C. §1323, FWPCA §313. An analysis of all environmental statutes with provisions addressing federal facilities would clarify the application of environmental laws to homeland security activities at such federal facilities.

Substance Control

TSCA has a tremendous potential for preventing terrorist incidents by controlling chemical and biological agents at the source. As it is written, the provisions are very broad and could establish the foundation for a fairly strict non-proliferation regime for substances that are identified to be of concern. For example, section 15 U.S.C. §2611, TSCA §12 provides that the requirements generally do not apply to toxic substances distributed for export unless the administrator determines a potentially unreasonable risk of harm in the United States. However, a notice of intent to export must be given to the administrator for a chemical substance whose manufacture or processing requires submission of test data or a premanufacture notice under the Act. While modifications to this language may be required, it could provide the basis for an assessment of chemical agents having the potential for weaponization that pose "an unreasonable risk harm in the United States." An analysis of the applicability of TSCA would clarify this issue as well as other issues regarding existing and potential opportunities to promote water security through this law.

NEPA

The extent to which NEPA applies to homeland security and drinking water issues—both the provisions set out in Section 101 and the agency cooperation and environmental impact statement provisions of Section 102—is an area ripe for further research. This research could consider both reactive government responses to an act of terrorism that affects the environment, and proactive government policies and programs to protect homeland security, as "major federal actions" within the scope of the statute.

Liability After the Fact/Civil and Criminal Penalties

Numerous federal environmental statutes provide for administrative and judicial penalties. For example, Section 42 U.S.C. §9609 (CERCLA) establishes administrative and judicial penalties for various violations. To the extent that weaponized biological and chemical agents are governed by these statutes, these penalties are an important element of homeland security response. An analysis of the penalty provisions of environmental statutes would clarify their applicability to actions involving weaponized biological and chemical agents that impact drinking water and other natural resources.

Citizen Suits

Citizen suit provisions are included in most federal environmental laws. They authorize legal action against alleged violators of the law or against the Administrator of EPA for failing to perform a nondiscretionary duty. For example, section 42 U.S.C. §300j-8, SDWA §1449 provides that any person may bring a citizen suit against alleged violators or the administrator. To the extent that the statutes can be interpreted to address terrorists events, including the release of weaponized biological and chemical agents, these provisions may apply. An analysis of the nature of terrorist actions, compared to the scope, in light of the citizen suit provision would clarify the potential application of these provisions. It would also help determine the nature of homeland security activities of the Administrator that may be mandatory or discretionary.

Ultimately, environmental laws administered by the U.S. EPA provide a framework that can be accessed to strengthen protection of human health and natural resources from acts of terrorism. By considering the focus of these laws and their potential applicability to homeland security issues, additional tools traditionally used for conventional drinking water matters can be applied to promote drinking water security.

CHAPTER 4
STATE ROLE IN HOMELAND SECURITY AND DRINKING WATER

While the federal government has taken the most extensive set of actions to protect homeland security, state governments have been far from idle. State-level initiatives have taken the form of revised laws, new policies, and new and reinvented programs. These kinds of actions are surveyed and discussed in this section, together with the efforts that provided a basis for their adoption. Illustrations of additional kinds of activities taken at the state and local levels are also provided.

STATE LEGISLATIVE ACTION

Model State Emergency Health Powers Act

To date, more than half of the 50 states have adopted legislation in response to the events of September 11, 2001. Many of the remaining states have legislation pending. An important measure that facilitated the speedy adoption of state laws addressing homeland security is the Model State Emergency Health Powers Act, which was created by the Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities. As of August 11, 2003, bills or resolutions based in whole or in part on the model law have been introduced in 43 states. Thirty-two states have passed such bills or resolutions.

The model act is intended to provide states with powers needed to detect and contain bioterrorism or naturally occurring disease outbreaks. Its structure reflects five basic public health functions that can be facilitated by law: (1) *preparedness*, comprehensive planning for a public health emergency; (2) *surveillance*, measures to detect and to track public health emergencies; (3) *management of property*, ensuring the adequate availability of vaccines, pharmaceuticals, and hospitals, as well as providing power to abate public health hazards; (4) *protection of persons*, powers to compel vaccination, testing, treatment, isolation, and even quarantine when clearly necessary; and (5) *communication*, providing clear and authoritative information to the public.

While the focus of the model law is on public health emergencies, it does contain limited provisions that may also be relevant to environmental matters, including drinking water protection. For example, in Article V of the Act, entitled Special Powers During a State of Public Health Emergency: Management of Property, Section 503 addresses the "safe disposal of infectious waste." Since improper disposal of infectious waste can contaminate sources of drinking water, it is highly relevant to water security.

Specific Types of Legislation Adopted by State Legislatures

States have taken a variety of approaches to address terrorism, including the following:

- **Water Protection:** measures directly affecting the water resource, such as assessments of source water for vulnerabilities; and measures affecting the water system, such as the establishment of public water supply protection programs;
- **Crimes and Law Enforcement:** measures directly affecting acts of terrorism, such as criminalization of acts of terrorism and the establishment of criminal penalties for these acts; and measures strengthening response to those acts, such as enhanced law enforcement efforts;
- **Administrative Actions:** measures strengthening government capacity, such as establishment of specific councils, task forces, and committees for addressing safety and security; and, measures protecting sensitive information, such as exemptions from public disclosure for certain kinds of documents and information;
- **Public Health Measures:** measures relating to emergency powers and communicable diseases;
- **Emergency Preparedness:** measures for emergency planning, management, and response; and,
- **Appropriation of Funds:** measures for securing resources to address terrorism, either in connection with the measures discussed above or for additional activities.

Some of the legislation analyzed relates to terrorism in general; while some relates specifically to terrorism directed against water supplies. Below is a brief definition of each type of legislation that states are adopting. Each

category includes at least one specific example of a state that has adopted or is considering adopting legislation in that category. This analysis was not designed to identify all state action, but rather to use examples that illustrate the nature of state actions.

Water Protection

Source Water Assessment. At least one state has taken legislative action following September 11th to require the development of a source water assessment program to determine the level of susceptibility of particular water sources to contamination. This legislation was identified and discussed in "State and Local Actions for Homeland Security" (see Introduction).

Connecticut. The applicable state statute provides that

> Each water company ... supplying water to one thousand or more persons or two hundred fifty or more consumers and any other water company... requested by the Commissioner of Public Health shall submit a water supply plan to the Commissioner of Public Health for approval with the concurrence of the Commissioner of Environmental Protection ... The plan shall include ... contingency procedures for public drinking water supply emergencies, including emergencies concerning the contamination of water, the failure of a water supply system or the shortage of water ... and on and after January 1, 2004, an evaluation of source water protection measures for all sources of the water supply, based on the identification of critical lands to be protected and incompatible land use activities with the potential to contaminate a public drinking water source.

(Conn. Gen. Stat.§25-32d (a), (b)).

Public Water Supply Protection. Although it is probable that most, if not all, states have passed legislation requiring the establishment of a program to protect the public water supply from contaminants, some states have updated these measures since September 11th. For example, in Maryland, recently updated legislation was identified in "State and Local Actions for Homeland Security."

Maryland. The applicable state statute provides that the Secretary of the Department of the Environment "may adopt and enforce regulations for a contaminant if the Secretary determines that the contaminant poses a significant risk to public health and for which complete interim or revised national primary drinking water regulations are not in effect." (Md. Code Ann., Envir. § 9.406 (c)).

Crimes and Law Enforcement

Crimes and Penalties. Several states have established crimes that define acts of terrorism and penalties for terrorism-related acts. This legislation typically defines the intentional contamination of a water supply as a crime and establishes penalties for those convicted of this act; some legislation goes further and gives definitions of the specific agents that are considered contaminants.

Oklahoma. The applicable state statute defines

> 'biochemical terrorism' as an act of terrorism involving any biological organism, pathogen, bacterium, virus, chemical or its toxins, isomers, salts or compounds, or any combination of organisms, viruses or chemicals that is capable of and intended to cause death, disease, injury, illness or harm to any human or animal upon contact or ingestion, or harm to any food supply, plant, water supply, drink, medicine or other product used for or consumed by humans or animals. Every act of terrorism is a felony. A person convicted of terrorism shall be punished by imprisonment in the State Penitentiary for a term not exceeding life. A person who kills another person or who causes the death of another person in the commission of an act of terrorism shall be guilty of murder in the first degree. A person convicted of biochemical terrorism shall be ordered, in addition to the punishment imposed for the act of terrorism, to reimburse the cost of any emergency personnel, equipment, supplies, and other expenses incurred by the state and any political subdivision as a result of responding to such act of terrorism.

(Okla. Stat. tit. 21 §§ 1268.1, 1268.2).

Law Enforcement. Several states have taken steps to require some action on the part of law enforcement entities in response to an act of terrorism or a public health emergency. An example of such legislation was identified for Maryland in "The Model State Emergency Health Powers Act State Legislative Activity" (see Introduction) and for Florida in "State and Local Actions for Homeland Security."

Maryland. The applicable state statute provides that, in the event of an emergency, which is defined as "the

threat or occurrence of an enemy attack, act of terrorism or public health catastrophe," it is the duty "of every law enforcement officer of the state or a political subdivision and every health officer of a political subdivision to execute and enforce orders, rules, and regulations made by the Governor."(Md. Code Ann. 16A §§ 3(d)(2), 12(B)).

Florida. The applicable state statute provides that

> the department, with respect to counter-terrorism efforts, responses to acts of terrorism within or affecting this state, and other matters related to the domestic security of Florida as it relates to terrorism, shall coordinate and direct the law enforcement, initial emergency, and other initial responses. The department shall work closely with the Division of Emergency Management, other federal, state, and local law enforcement agencies, fire and rescue agencies, first-responder agencies, and others involved in preparation against acts of terrorism in or affecting this state and in the response to such acts. The executive director of the department, or another member of the department designated by the director, shall serve as Chief of Domestic Security Initiatives for the purpose of directing and coordinating such efforts. The department and Chief of Domestic Security Initiatives shall use the regional domestic security task forces as established in this chapter to assist in such efforts.

(Fla. Stat. Ann. 943.03 (14)).

Administrative Actions

Councils/Task Forces/Committees. Several states have taken steps to establish councils, task forces, committees or other such entities for the purpose of ensuring the safety and security of public health in general, and in some cases, the safety and security of the water supply. Examples of this type of legislation were identified for New Jersey in "State and Local Actions for Homeland Security," and South Carolina in "The Model State Emergency Health Powers Act State Legislative Activity."

New Jersey. A bill signed by the Governor on October 4, 2001, establishes the Domestic Security Preparedness Task Force and the Domestic Security Preparedness Planning Group "in order to maximize, enhance and effectuate coordination of the disaster preparedness and recovery resources provided through the Office of Emergency Management in the Division of State Police, the New Jersey National Guard and county and local emergency management organizations." (New Jersey SB 2575(2001)/Public Law 2001, Chapter 246).

South Carolina. The applicable state statute provides that a special purpose district "charged with the operation and maintenance of natural gas distribution facilities, wastewater plants or treatment facilities, or water treatment facilities, or with the operation and management of any water distribution system," is authorized to "establish a public safety department to protect and police the facilities owned by the district under such reasonable rules and regulations as the district may from time to time promulgate. The district may appoint and commission as many public safety officers as necessary for the proper security, general welfare, and convenience of the facilities." (S.C. Code Ann. § 6-11-340).

Public Records. Several states have allowed for certain documents to be exempt from the public record. In some states, these documents include: building plans, blueprints, schematic drawings, and diagrams of water systems; security system plans; and records relating to state or local government security.

Michigan. The applicable state statute provides that,

> a public body may exempt from disclosure as a public record under [the state Freedom of Information Act] any of the following... Records or information of measures designed to protect the security or safety of persons or property, whether public or private, including, but not limited to, building, public works, and public water supply designs to the extent that those designs relate to the ongoing security measures of a public body, capabilities and plans for responding to a violation of the Michigan anti-terrorism act, chapter LXXXIII-A of the Michigan penal code, 1931 PA 328, MCL 750.543 to 750.543z, emergency response plans, risk planning documents, threat assessments, and domestic preparedness strategies, unless disclosure would not impair a public body's ability to protect the security or safety of persons or property or unless the public interest in disclosure outweighs the public interest in nondisclosure in the particular instance.

(Mich. Comp. Laws § 15.243 (1)(y)).

Public Health Measures

Public Health and Communicable Disease. Several states have enacted legislation that, among other provi-

sions, clarifies emergency powers and authorities in times of public health emergencies; specifies the terms under which a public health emergency is declared; and identifies ways to improve preparedness for and management of public health emergencies. An example of such legislation was identified for Maine in "The Model State Emergency Health Powers Act State Legislative Activity." Regarding communicable disease specifically, some states have taken action to amend existing laws regarding the definition of communicable diseases, the use of quarantines, and the detainment of persons infected with a threatening communicable disease. Examples of this type of legislation were found for Maine, New Mexico, and Arizona in "The Model State Emergency Health Powers Act State Legislative Activity."

Maine. The applicable state statute provides that "in the event of an actual or threatened epidemic or outbreak of a communicable or occupational disease, the department may declare that a health emergency exists and may adopt emergency rules or implement rules previously adopted designed to become effective upon the declaration of a state of public health emergency by the Governor, the Governor's designee or a person acting in place of the Governor for the protection of the public health..." (Me. Rev. Stat. Ann. tit. 22 § 802 2).

New Mexico. The appropriate state statute provides that,

> when a physician or other person knows that a person is infected with a threatening communicable disease, he shall promptly notify a public health official or his agent. A public health official who has knowledge that a person is infected with a threatening communicable disease and has refused voluntary treatment, detention or observation shall petition the court for an order to detain the person who is infected with the threatening communicable disease until the person is no longer a contagious threat to the public or the person voluntarily complies with the appropriate treatment and contagion precautions.

It further provides that

> [c]ounsel may be retained by the person held or shall be appointed by the court if the court determines that the person held cannot afford legal representation or if the court determines that appointment of counsel is required in the interest of justice.... At the evidentiary hearing the court shall review the circumstances surrounding the temporary order and, if the petitioner can show by clear and convincing evidence that the person being held has not voluntarily complied or will not voluntarily comply with appropriate treatment and contagion precautions, the court may continue the detention of the person infected with a threatening communicable disease...."

(N.M. Stat. Ann. § 24-1-15).

Arizona. In Arizona, a bill originally intended to set standards for the board of dental examiners was amended to include bioterrorism and surveillance provisions. The bill, HB 2044 (2002), amends and adds to the Arizona Revised Statutes. Among other provisions, it allows the Governor, in consultation with the Director of the Department of Health Services, to "issue an enhanced surveillance advisory if the governor has reasonable cause to believe that an illness, health condition or clinical syndrome caused by bioterrorism, epidemic or pandemic disease or a highly fatal and highly infectious agent or biological toxin has or may occur or that there is a public event that could reasonably be the object of a bioterrorism event." (Ariz. Rev. Stat. Ann. § 36-782).

Emergency Preparedness

Emergency Planning, Management, and Response. Several states have enacted legislation that addresses the preparation for and carrying out of emergency functions with respect to disasters, and that now includes terrorism in its scope. Emergency functions include but are not limited to fire services, law enforcement, emergency medical services, transportation, communications, public works and engineering building inspection, planning and information assistance, mass care, resource support, health and medical services, and search and rescue. Examples of this type of legislation were identified for Kansas in "State and Local Actions for Homeland Security" and for Maryland in "The Model State Emergency Health Powers Act State Legislative Activity."

Kansas. The applicable state statute provides that

> the division of emergency management shall: ... develop and administer a program to provide financial assistance to cities, counties or interjurisdictional disaster agencies for the development and implementation of a terrorism preparedness program. Such program shall provide criteria for receiving such financial assistance and such other conditions as the division may deem necessary; and develop, implement and adminis-

TABLE 2: SELECTED STATE LEGISLATIVE ACTION

STATE	WATER PROTECTION	CRIMES AND LAW ENFORCEMENT	ADMINISTRATIVE ACTIONS	PUBLIC HEALTH MEASURES	EMERGENCY PREPAREDNESS	APPROPRIATIONS
Alabama						
Alaska						
Arizona				☑		
Arkansas						
California			☑	☑		☑
Colorado					☑	
Connecticut				☑		☑
Delaware				☑	☑	
District of Columbia		☑	☑	☑	☑	
Florida		☑	☑	☑		
Georgia				☑		
Hawaii				☑		
Idaho		☑		☑		
Illinois				☑		
Indiana						
Iowa						
Kansas						
Kentucky				☑	☑	
Louisinana				☑		
Maine				☑		
Maryland	☑	☑	☑	☑	☑	
Massachusetts			☑			
Michigan			☑			
Minnesota				☑		
Mississippi						
Missouri		☑	☑			
Montana				☑		
Nebraska						
Nevada				☑		
New Hampshire	☑	☑	☑	☑	☑	☑
New Jersey		☑	☑	☑		☑
New Mexico				☑	☑	
New York				☑		
North Carolina						
North Dakota						
Ohio				☑		
Oklahoma		☑				
Oregon				☑		
Pennsylvania				☑		
Rhode Island				☑		
South Carolina		☑	☑		☑	
South Dakota				☑		
Tennessee				☑		
Texas		☑		☑		
Utah				☑		
Vermont		☑				
Virginia				☑		
Washington					☑	
West Virginia						
Wisconsin				☑		
Wyoming				☑		

> ter, with the assistance and advice of the commission on emergency planning and response, a plan for regional emergency medical response teams.

(Kan. Stat. Ann. § 48-928(n),(o))

Maryland: A bill signed by the Governor on April 8, 2002 adds the Maryland Emergency Management Assistance Compact to the state statutes. The compact provides for mutual assistance in managing an emergency among "jurisdictions" entering into the compact. The "jurisdictions" include the 23 counties within Maryland, Baltimore City, and Ocean City. The compact also provides for mutual cooperation in emergency-related exercises, testing or other training activities that use equipment or personnel simulating performance of any aspect of the giving and receiving of aid by party jurisdictions during emergencies. (MD Senate Bill 239 (2002), adding MD Ann. Code art. 16A §§ 37 - 39)

Appropriation of Funds

Appropriations. Several states have taken legislative action to authorize funds for emergency health and domestic security preparedness. The bills listed in the examples below were identified in "State and Local Actions for Homeland Security."

New Hampshire. A bill signed by the Governor on May 17, 2002, "establishes a fund to be used for the administration of the radiological health program." (N.H. House Bill 1478 (2002))

New Jersey. A bill signed by the Governor on October 4, 2001 appropriates $8.95 million for anti-terrorist activities.

> Of that amount, $2,700,000 is appropriated to the Division of State Police to fund and equip the counter-terrorism unit; $1,000,000 is appropriated to fund and enhance the services provided by the Office of Emergency Management; $2,000,000 is appropriated to fund, train and equip a domestic emergency response team in the Department of Military and Veterans Affairs; $1,800,000 is appropriated to establish a program of laboratory services in the Department of Health and Senior Services to provide for the prompt and accurate detection and analysis of biological and chemical agents that may be used in terrorist acts and $1,450,000 is appropriated to the Department of Health and Senior Services to fund a program of disease surveillance and epidemiological investigation.

(N.J. Senate Bill 2575 (2001)/Public Law 2001, Chapter 246).

The chart on the previous page indicates the states that have adopted, or are considering adopting, legislation in each of the categories described.

SELECTED STATE POLICIES AND PROGRAMS

In addition to adopting legislation, states have pursued innovative approaches through policies and programs designed to protect water supplies from terrorist activities. Additionally, numerous local governments and water utilities are taking action of their own by providing educational information and assistance for completion of vulnerability assessments and emergency response plans for drinking water facilities. The types of activities being undertaken by states and municipalities include preparation of educational and guidance materials, creation of task forces, engagement of local goverment, utility action, and stakeholder communication and coordination. These efforts address water suppliers, first responders to incidents of bioterrorism, and the general public. While this analysis is not intended to provide a comprehensive list of all state activities regarding drinking water protection, examples of each of these activities in key states are given and summarized below.

Educational and Guidance Materials

Guidance Documents for Water Suppliers

Alaska: The Department of Environmental Conservation, Division of Environmental Health, Drinking Water and Wastewater Program prepared a fact sheet that urged water suppliers to immediately examine their own operations and identify needed improvements in security and emergency preparedness. It also identified the "top 10" measures that could be taken to protect the water system from contamination.

Arizona: The Department of Environmental Quality prepared a Drinking Water Emergency Operations Plan Checklist. It addresses the steps a water system should take to assure continuation of service under a variety of emergency situations (e.g., loss of source of the water supply; loss of supply due to major component failure or structural collapse; damage to power supply equipment and loss of power; contamination of the distribution system due to backflow; collapse of reservoirs or reservoir roofs or pumphouse structures; breaks in transmission or

distribution lines; chemical or microbiological contamination of water supply). It also addresses other key elements of water supply, including: provisions for alternative water sources; notification procedures; disinfection and testing procedures; inventory of spare parts; and emergency response training for operational staff.

Colorado: Prior to September 11th, the Colorado Department of Public Health And Environment developed a fact sheet on "Directions for Developing Emergency Plans" for Small Non-Community Public Water Systems. The document raised important issues, including: identification of all events or threats that affect the ability to produce water; assessment of the impacts of a threat; a communications plan; and a plan to correct the damage caused by the event.

Idaho: The Department of Environmental Quality produced a guide to help water supply facilities understand the basic standards for an emergency plan. The purpose of the plan is: (1) to establish a procedure for management and staff of a water system to follow in case of an emergency; (2) to help a water system reduce its vulnerabilities to emergencies. The guide addressed the following elements: system identification; chain-of-command; notification; system components; boil water notification; alternative water source; water conservation; vulnerability assessment; and plan readiness.

Massachusetts: The Department of Environmental Protection, Drinking Water Program originally prepared a handbook for water supply emergencies in December 1990. It was updated in September 2001, and revised again in August 2002. The purpose of this handbook is to guide water suppliers during preparation of their Emergency Response Plans, as well as to assist them during emergencies. It also provides guidelines for preparing an Emergency Response Plan, and differentiates emergency situations according to five different levels—for example, Level 5 is Nuclear Disasters/Terrorists Acts. It defines a terrorist act as the deliberate release of highly toxic materials into a water supply. Response procedures include removing the affected water supply source or closing the distribution system until it can be fully evaluated for contamination. It also includes directives issued by the state emergency management agency and identifies the necessary assistance to this agency. It contemplates directives to the public, advising them to not use surface or ground water until the source is analyzed and approved to be safe for human or animal consumption, and to limit their ingestion to water stored in closed containers or bottled water until after the surface or ground water has been tested and approved for consumption. It joins the Department of Health to address technical assistance and provide information on testing water sources to ensure that they are safe for consumption. Records maintenance is a key element of the strategy. It also has a chain of command reporting system linking all relevant agencies.

Michigan: The Department of State Police, Emergency Management Division prepared a report entitled *Michigan Homeland Security Readiness Report*, dated September 2002. This report addressed drinking water safety by describing actions that have been taken by the Department of Environmental Quality since September 11th. These measures include distribution of an alert to all Public Water Systems advising them of the need to heighten their awareness, increase security, and review emergency operations plans. It also includes distribution of a water system security guidance document that addresses four areas: conducting comprehensive vulnerability assessments, providing security enhancements, updating emergency management plans, and incorporating security enhanced designs into facility upgrades or expansions.

New Mexico: The Drinking Water Bureau of the Environment Department used recommendations by U.S. EPA's Office of Ground Water and Drinking Water to prepare educational materials. The following components are addressed: guarding against unplanned physical intrusions; making security a priority for employees; coordinating actions for effective emergency response; and investing in security and infrastructure improvements. The last element involves assessment of the vulnerabilities of source water protection areas, drinking water treatment plants, distribution networks, and other key infrastructure elements. It recommends addressing the most obvious and cost-effective physical improvements (e.g., tamper-proofing manhole covers, fire hydrants, and valve boxes), improving computer systems and remote operational security, and seeking financing for more expensive and comprehensive system improvements.

Tennessee: A memorandum, "Water Supply on Infrastructure Security" was prepared by the Department of Environment and Conservation in November 2001. It provided a number of simple measures that could be taken to increase security at water and wastewater facilities, including: controlling and securing any hazardous chemicals; providing operators with panic buttons, adequate lighting, and video surveillance cameras of critical areas around the plant; making sure systems have sufficient valves and blow-off devices that can be used to isolate and flush contamination; requiring background checks on all contractor personnel entering sensitive areas; and requir-

ing plant managers to periodically monitor local lakes and streams for dying or distressed fish and wildlife.

Wisconsin: A letter was distributed by the Director of the Department of Natural Resources' Bureau of Drinking Water and Groundwater. The letter identified recommended actions, including the performance of a security analysis for facilities. It indicated that the recommendations were either required by current state regulations or have been long recognized as sound operational security practices. The letter then identified several direct measures that should be taken: covering all openings into reservoirs, locking pump houses, restricting public access to vulnerable areas, personnel training and security clearance, maintaining effective disinfection capability such as chlorine, ozone, and UV, and developing a list of alternate emergency water sources, such as industrial commercial and private wells. Finally, the letter provided references to security networks.

Bioterrorism FAQs

Connecticut: The Department of Public Health prepared "A Fact Sheet on Bioterrorism Preparedness" to address common questions. One question specifically addressed water supplies. In response to the question "Are the State's water supplies safe from bioterrorism?", the CDP minimized the risk by stating that: reservoirs are an unlikely target for bioterrorists; effective methods are in place to filter and clean the water supply against most biological agents; disinfection through chlorine protects drinking water from water-borne bacteria and would neutralize biological agents; and the large quantity of water in the water supply would dilute the biological agent, limiting its ability to do harm.

Pennsylvania: The Department of Environmental Protection has prepared a FAQ entitled "Be Vigilant, Be Safe: Preventing and Responding to Environmental Emergencies—Protecting The Nation's Water Supplies from Terrorist Attack." This document identifies the kinds of terrorism threats that exist to drinking water; describes EPA's efforts to address water supply protection from terrorist attack; addresses the use of bottled water and the need for boiling water; and provides information resources. It also minimizes the risk of harm from contamination of the water supply based on the assumption that dilution and treatment will prevent exposure to sufficient quantities of biological or chemical agents to cause illness.

Utility Action

District of Columbia: The Washington Aqueduct provides drinking water to 1 million people in the DC area. Security efforts include multiple methods of controlling access to the Aqueduct's facilities. It establishes controls on physical access, chemical storage, and operational systems in order to safeguard the water. It addresses federal recommendations to consider guarding against intrusions, reviews emergency response plans, and increased vigilance. Among their resources, they provide a list of national, regional, and local contacts that are involved in drinking water issues.

Task Force Creation

Ohio: The State of Ohio Security Task Force convened two meetings in early 2002 that involved representatives in first response and their state organizations, emergency management agencies, and public health agencies. From those meetings a document entitled "Threatened Human Biologic Incident: Ohio Guidelines" (September 2002) was produced. The guidelines are designed to assist local officials in dealing with threatened biologic terrorism incidents; chemical and nuclear incidents were not discussed. Drinking water was addressed from the perspective of the role of the Ohio EPA in assessing a credible threat. Disposal of infectious wastes or contaminated items, including runoff, was raised as a factor to consider in determining impact on drinking water. Impact of the biological agent incident on the safety of public drinking water was also highlighted.

Local Government Engagement

South Dakota: The governor sent a letter to the mayors of the state urging them to protect public drinking water systems safe from terrorism. The letter urged assessment of vulnerabilities and measures that could be taken to improve security. It also listed the ways in which a drinking water system could be disrupted or damaged (e.g,. contamination of the raw water source or reservoirs with chemical or biological agents; physical damage to water storage structures, intake structures, treatment plant; loss of power to the treatment plant or computer malfunction; damage to the distribution system; and the pumping or siphoning of chemical or biological agents into the distribution system from a private home or other access point (e.g., fire hydrant). Finally, the letter provided a list of suggested security measures that should be considered, including security details, communication with law enforcement, and monitoring of raw water quality.

Stakeholder Communication and Coordination

Minnesota: The Department of Health addresses drinking water protection from terrorists and ordinary vandals through the following measures: coordination (communication with local law enforcement, local emergency managers, personnel training, public notification planning, and linking with the Health Alert Network (HAN); access to facilities (restrict access with physical barriers to reservoirs, treatment system vents, and intakes; lock facilities; store chemicals in secure facilities); access to documents (limit access to water distribution maps and plans of facilities); require security for contractors; access to computer systems (obtain technology security); limit access; join the Information Sharing and Analysis Center (ISAC); monitoring (maintain good records, good dialogue with law enforcement); daily visits with facility; water disinfection (free chlorine residual, check on chemical quality on a regular basis, chlorine residual recorders).

Ultimately, state and local governments play a vital role in drinking water security. States have adopted legislation and policies, and created or revised programs. Approaches taken to strengthen homeland security and drinking water safety include water protection, crimes and law enforcement, administrative actions, public health measures, emergency preparedness, and appropriation of funds. Additional actions include preparation of educational and guidance materials, local government engagement, stakeholder communication and coordination, and utility action. Altogether, these measures increase drinking water protection from both conventional challenges and terrorist threats.

CHAPTER 5
CASE STUDY: FLORIDA'S RESPONSE TO HOMELAND SECURITY AND DRINKING WATER ISSUES

INTRODUCTION

The experience of government and non-governmental organizations in Florida demonstrates the interests and capacity of state governments to take action to address homeland security and drinking water safety. Homeland security measures taken in Florida illustrate the nature of activities that can be pursued to protect drinking water from terrorist events. Florida was selected for the case study for numerous reasons.

First, Florida has a large number of people, both residents and tourists, who rely on public water supply systems for safe drinking water. There are over 12 million people connected and served by large public water systems that are regulated under the Florida Safe Drinking Water Act, with an additional 40 million visitors using these water systems annually. Over 90 percent of these 12 million residents are served by the largest 10 percent of drinking water systems; of the 1,995 community water systems regulated under the Florida Safe Drinking Water Act, approximately 236 serve a population greater than 10,000. Further, over three million Floridians are served by smaller water systems that are not regulated by this act. Since September 11, 2001, there have been numerous reported incidents in Florida involving drinking water security. For example, between January and April of 2003, there were approximately 100 incident reports filed with the State of Florida. Fortunately, none of these incidents have resulted in contamination of drinking water, nor were there any adverse health effects associated with the incidents.

In addition, Florida mustered a swift response to the events of September 11th through executive orders, appropriations, and legislation. Florida's Comprehensive Counter-Terrorism Strategy became the first such strategy to be published, and was the first submitted to Governor Ridge upon his appointment as Homeland Security Advisor to President Bush. Florida's prompt and vigilant response to September 11th was facilitated by its premier disaster preparedness and response capabilities. The state's Emergency Management Operations are often cited as a model of how to cope with natural catastrophes, such as hurricanes and wildfires.

Finally, Florida is considered a high-alert area for terrorist actions. It has a large number of military bases; it has already experienced the physical and psychological effects of bioterrorism through the recent anthrax episode, which started in the state; and 13 of the 19 September 11th hijackers had lived in, transited through, or trained for their deadly missions within Florida's borders in the months and years prior to the attacks.

This case study examines drinking water security activities in Florida, which include actions taken by the governor, legislature, and state agencies to protect drinking water from acts of terrorism. It also highlights efforts by non-governmental associations to increase protection of drinking water from terrorist events.

EXECUTIVE ORDERS

Florida Governor Jeb Bush has issued several Executive Orders in response to the terrorist acts of September 11th. On that date, he issued Executive Order 01-262, declaring a state of emergency in Florida by reason of the combination of terrorist acts that were perpetrated that day. In that Executive Order, the governor delegated to the Florida Department of Law Enforcement (FDLE) the operational authority to coordinate and direct law enforcement and other resources of all state, regional, and local governmental agencies to take precautions needed to protect the state from terrorist acts.

On October 11, in response to an "Assessment of Florida's Anti-Terrorism Capabilities," Governor Jeb Bush signed Executive Order 01-300 on Domestic Security. This order:

- mandated FDLE to organize a Regional Domestic Security Task Force in each of FDLE's seven operational regions, with representation from the Department of Health, Division of Emergency Management, and appropriate and available county and local officials;

- instructed the Department of Highway Safety and Motor Vehicles to continue researching methods to reduce the fraudulent issuance of driver's licenses;
- appointed the Commissioner of the FDLE to serve as Chief of Florida Domestic Security Initiatives;
- instructed the Director of the Division of Emergency Management to assist the Chief of Florida Domestic Security Initiatives;
- created the Florida Domestic Security Advisory Panel to provide assistance to the Governor, the Legislature, the Chief of Florida Domestic Security Initiative, and other pertinent entities;
- charged the Public Information Offices of FDLE and the Division of Emergency Management with making regular and ongoing public advisory announcements to equip Floridians with an understanding of Florida's resources for dealing with threats to public safety, to raise general public awareness of potential threats, to identify the methods for reporting suspicious persons or activities, to identify the methods to respond to incidents of terrorism, and other actions to be taken in the event of a terrorist act; and,
- mandated the Department of Health to address concerns about terrorist use or exploitation of chemical or biological devices, including enhanced communication capabilities and preparedness for a chemical or biological attack.

While not specifically addressing drinking water protection, these measures spoke about infrastructure protection and put into place a system to address acts of terrorism through enhanced law enforcement, expanded emergency management, and effective communication with the public.

LEGISLATION

In the first legislative session following the events of September 11th and the anthrax incident in Palm Beach County, the Florida Legislature adopted legislation designed to significantly enhance Florida's preparedness and capability to protect the state from terrorist actions. The new laws increase the capacity for coordination and cooperation at the scene of a terrorist incident, and provide essential tools to improve investigations and prosecutions to prevent future attacks. The following bills were adopted and signed into law:

- Senate Bill 24-C requires the FDLE to coordinate and direct responses to acts of terrorism, and establishes by law the Regional Domestic Security Task Forces and the Chief of Domestic Security Initiatives.
- Senate Bill 26-C creates the Florida Domestic Security and Counter-Terrorism Intelligence Center within FDLE, and allows for the creation of the Florida Domestic Security and Counter-Terrorism Intelligence Database to be housed in the intelligence center.

In addition, Governor Bush separately signed the following additional legislation that provides law enforcement with needed tools to investigate suspected terrorists and improve domestic security:

- Senate Bill 6-C defines the term "terrorism" for the purposes of the Florida Criminal Code.
- Senate Bill 8-C provides for enhanced sentencing for acts of terrorism.
- Senate Bill 10-C creates penalties for the introduction of biological, radiological, and other "poisons" to food, drink, water systems, and medicine.
- Senate Bill 12-C allows a circuit judge's order to have a statewide effect with regard to wiretaps involving "terrorism" crimes.
- Senate Bill 14-C allows for tighter regulation of aerial spraying of pesticides, fertilizers or seed.
- Senate Bill 16-C provides a public records exemption for security system plans of any property owned or leased by the state.
- Senate Bill 18-C creates public records exemptions for security plans for hospitals.
- Senate Bill 20-C provides a public records exemption for information regarding stockpiled protective pharmaceuticals.
- Senate Bill 22-C provides a public records exemption for the requests of public records held by law enforcement agencies for information related to an active investigation.

The Florida Legislature has not taken specific action regarding drinking water security. However, measures taken to strengthen law enforcement capabilities, to better control spraying of pesticides and fertilizers, and to protect vulnerable information from terrorists, all contribute to increased protection of drinking water supplies.

In addition to legislation adopted specifically to address terrorism, Florida has enacted legislation for drinking water protection in general. The Florida Safe Drinking Water Act (FSDWA), Chapter 403, Part VI, Fla. Stat., covers public water systems serving 15 or more service connections or 25 or more people daily for at least 60 days of the year. The FSDWA is implemented primarily by the Florida Department of Environmental Protection (FDEP), and delegated to 10 County Health Departments. In addition, private, multi-family, and

other public water systems not covered by the FSDWA are governed by Chapter 381.0062, Fla. Stat. This act is implemented by the Florida Department of Health (FDOH).

Florida has also adopted general legislation addressing drinking water emergencies that could apply to terrorist events. Chapter 403.855, Fla. Stat., which addresses imminent hazards, provides the FDEP, in coordination with the FDOH, with authority to take action upon receipt of information that a contaminant that is present in, or is likely to enter, public or private water supplies may present an imminent and substantial danger to the public health. Chapter 403.856, Fla. Stat. requires FDEP, in consultation with the FDOH, to adopt a plan for the provision of safe drinking water under emergency circumstances. It also authorizes the FDEP to issue a rule or order to provide safe drinking water when emergency circumstances exist and such water is not otherwise available.

RULEMAKING

Florida has taken specific action to increase its authority to address drinking water security through rulemaking. On January 22, 2003, the FDEP published an Emergency Rule requiring notification of the State Warning Point (SWP) immediately after a public water supply system owner or operator becomes aware of a suspicious incident, security breach, or act of sabotage at or against their water system or any of its facilities. (Operation and Maintenance of Public Water Systems, 62ER03-1, Fla. Admin. Code R. 62-555). By law, the emergency rule can remain in effect for 90 days. Accordingly, the emergency rule provisions have been adopted by the Department and became effective on August 28, 2003, as part of the revisions to the Permitting Rule, Chapter 62-555, Fla. Admin. Code.

The rule requires owners and operators of all of the approximately 2,200 community public water systems to call the SWP immediately, but no later than two hours, after they become aware of an actual or suspected security breach, suspicious incident, or act of sabotage. Enforcement penalties are stipulated for failure to notify the SWP and take precautions to protect public safety. Penalties of up to $5,000 per day can be assessed. Possible corrective actions include extensive security improvements, structural changes, operational modifications, and when necessary, utility shutdown.

Operational procedures were adopted to support proper response to reported incidents. Upon receipt of a call by the SWP, the duty officer must record the call, and if appropriate, contact the regional emergency response representative, FDEP law enforcement, FDOH, county health department, local FDEP Drinking Water program, and others as necessary. Additional contacts may include local law enforcement and laboratory response personnel.

The rule, as implemented, serves as a catalyst for the the public water supply utility to work with representatives from FDOH, FDEP, local law enforcement, and emergency response to assess the situation and develop and implement a plan of action. To ensure a prompt response, if water quality sampling is deemed necessary, FDOH and FDEP emergency response teams will collect and ship the samples directly to one of their laboratories. This approach also allows for testing for different parameters by broader methods on an expedited basis. Field testing by agency staff or the utility is recommended for possible changes in basic water quality parameters, such as chlorine residual, pH, conductivity, and alkalinity. An extensive list of parameters are analyzed at the FDOH or FDEP laboratories.

To promote compliance with the emergency rule, copies were mailed to more than 11,000 public water system owners and operators. Since the emergency rule became effective in January 2003, the SWP has averaged between one to two calls per day. Only one call has resulted in the need to shut down any water storage facilities and conduct extensive water sampling, even though the result was later found to be negative.

In addition to the rule specifically governing potential terrorist events, Florida has adopted several general rules addressing drinking water. Drinking water standards, monitoring and reporting are governed by Chapter 62-550, Fla. Admin. Code. Permitting and constructing of public water systems are governed by Chapter 62-555, Fla. Admin. Code. Requirements for public water systems that are out of compliance are governed by Chapter 62-560, Fla. Admin. Code. These rules are administered primarily by the FDEP. An additional rule administered by the FDOH addressing smaller drinking water systems is Chapter 64E-8, Fla. Admin. Code.

FUNDING

A fundamental component of homeland security and drinking water safety is funding to implement measures at all levels. Florida has committed significant financial resources, and has received critical funding from the federal government to achieve domestic security. As of November 2002, Florida has invested more than $112 million in state and federal funding of drinking water security. In the 2001 Special Session of the Florida Legislature, $17 million was committed to combat terrorism in the first half of 2002, with an additional $94 million allocated in FY 2002-2003. These funds were used to assist local law enforcement with security training and equipment, expand food and vehicle inspections, con-

tinue funding for bioterrorism and other health security programs, enhance seaport security and prevent cyber-terrorism. To support the Regional Domestic Security Task Forces, $20 million has been awarded to the FDLE and Florida Division of Emergency Management. In addition, $38.3 million has been awarded to the FDOH and the Department of Agriculture and Comsumer Services to address bioterrorism and other health programs. The U.S. EPA has awarded more than $3 million to conduct vulnerability assessments and prepare emergency response plans for public water systems, with almost 30 large drinking water utilities receiving grants. The U.S. Department of Transportation has awarded Florida $19.7 million to enhance security at ports for FY02-03.

AGENCY ACTION

In addition to the legislative and executive actions described above, numerous programmatic activities are underway in Florida to protect drinking water and other natural and economic resources from terrorist actions. These activities are described according to agency.

Florida Department of Environmental Protection

The FDEP is the lead agency in state government for environmental management and stewardship. It has primary responsibility for implementation of the federal Safe Drinking Water Act (SDWA), Clean Water Act (CWA), Clean Air Act, Resource Conservation and Recovery Act (RCRA), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, FDEP is responsible for the SDWA rules, state water quality standards, establishment of total maximum daily loads, permitting of industrial and domestic waste facilities, and cleanup of contaminated sites.

In response to September 11th, the FDEP and the FDOH established a coalition to address the terrorist threat, particularly in the event of an intentional destruction or contamination of drinking water supplies. Objectives of the "Health and Environment Terrorist Coalition" were to: assess vulnerabilities of water systems, conduct scenario planning on the range of vulnerabilities, and review or develop public educational material. The coalition includes four workgroups: response, drinking water safety, laboratory coordination, and communications. The coalition has held water terrorism table-top exercises; conducted satellite broadcast and regional training for FDOH, FDEP, and Regional Domestic Security Task Forces; and shared emergency contact information at all levels and between the state agencies involved in homeland security.

There are also several specific programs within the FDEP that address homeland security and drinking water safety.

Division of Water Resource Management, Drinking Water Section. Drinking water security is directly addressed by the Division of Water Resource Management, Drinking Water Section. Its major focus is on water systems and infrastructure assessment. Within hours of the terrorist attacks on September 11th, the section—in conjunction with the Emergency Operations Center—sent a letter to FDEP District offices approving county health departments that regulate public water supply systems, advising them to take a "precautionary approach to raising the general awareness to security issues" at Florida's drinking water facilities. The section specifically requested that all surface water facilities and all community systems that serve a population of at least 10,000 be contacted as soon as possible to convey information on precautionary measures (e.g. increase the hours and number of operators/staff on site; increase inspections of well fields or source water intakes; and, secure vulnerable parts of the facilities, such as open tanks and chemical feed and storage/handling areas).

Another major activity in direct response to drinking water security issues is the adoption and implementation of the Emergency Notification Rule, discussed previously. In addition to the rulemaking activities, the section maintains a "State Warning Point Incident Tracer Report." This system covers the incident date and number, Public Water System Identification Number, county, city, level of severity, and status. For each incident, details such as type, location, description of incident, and contact information, are also provided.

The section is also involved in increasing consideration of security measures by small drinking water systems when performing a sanitary survey. A sanitary survey is defined as "an onsite review of the water source, facilities, equipment, operation and maintenance of a Public Water System (PWS) for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing of safe drinking water." (40 C.F.R. § 141.2). The section is assisting utilities through educational documents, training, and other measures.

Further, the section publishes a free drinking water newsletter, entitled "The Floridian," which addresses drinking water issues in general (e.g., consumer confidence reports, source water assessment and protection) and water security issues specifically (e.g., reporting suspicious or actual incidents or threats to water systems, submitting small system vulnerability assessments to U.S.

EPA, and announcements of terrorism preparedness and response training).

Division of Law Enforcement. The Division of Law Enforcement is charged with the responsibility of providing emergency response, environmental investigations, and park law enforcement services throughout the state of Florida. The division is capable of providing assistance in both natural and man-made disasters, and is on call 24 hours a day. Within the division, the Bureau of Emergency Response responds to any incident or situation that represents an imminent hazard, or threat of a hazard, to the public health, welfare, and safety, or to the environment. Its mission is to protect the public safety and environment through planning and organization of resources. The Bureau of Environmental Investigations investigates all credible reports of criminal wrongdoing. The officers of the division are sworn state law enforcement officers with full powers of arrest.

The division plays an important role in drinking water security. Its focus is on emergency response and investigation of reported incidents. In this capacity, it was involved in the September 11th assessment of infrastructure and emergency services. The division uses the State Warning Point Incident Planner to categorize the level of severity of incident type at drinking water facilities and determine the call down list. Of the three incident security levels, the division responds to Level 3 incidents in which a public drinking water system reports an intentional incident known to affect water quality, water pressure, or the water distribution system. Level 3 also includes incidents in which intruders are known to have gained access to the drinking water system.

On a routine basis, the Bureau of Emergency Response collects samples in accordance with quality assurance and control procedures and accepted lab practices, and sends them to state laboratories. In addition, the FDEP laboratories have developed and deployed emergency water testing kits. The FDEP kit is used to collect samples for criminal prosecution. It also uses the NIMS Incidence Command System, which Florida was the first state to adopt.

Florida Department of Health

The FDOH assumed a major role in homeland security following September 11th—and that role continues to increase. As mentioned previously, FDOH was activated through Executive Order 01-300. Its current role includes the following:

- enhancing communication capabilities through a web-based disease outbreak and communication network for health providers;
- strengthening state and county epidemiological outbreak analysis;
- providing for electronic transmission of laboratory results for biological or chemical agents;
- stockpiling necessary treatments; and,
- developing statewide epidemic intelligence service

Specifically regarding drinking water, the FDOH plays a crucial and direct role. While the FDEP is authorized by the U.S. EPA to manage the Safe Drinking Water Act within the state, FDEP has delegated the SDWA authority through an interagency agreement to 10 of the 67 Florida County Health Departments. The delegated counties are: Broward, Dade, Hillsborough, Lee, Manatee, Palm Beach, Pinellas, Polk, Sarasota, and Volusia. The FDEP remains responsible for implementing the SDWA in the other 57 counties and does so through their six district field offices. The FDOH provides administrative oversight and assistance to the delegated counties. The FDOH also regulates all water systems not regulated under the SDWA (systems serving less than 25 people), including private wells. The FDOH regulates a significant portion of the population's drinking water, including both the delegated systems and the smaller systems.

The State Health Officer of the FDOH is responsible for declaring public health emergencies and issuing public health advisories, and is authorized to take any appropriate action to enforce any health advisory. The FDOH also has authority to require the implementation of more stringent drinking water standards or to apply standards to additional public water systems under the SDWA, based on a substantial threat to public health.

In addition to this general authority, there are several programs that address homeland security within FDOH.

Division of Emergency Medical Operations. This new division was created through the merger of the Office of Public Health Preparedness, Office of Emergency Operations, and Bureau of Emergency Medical Operations. The mission of the division is a combination of the responsibilities of each office. The division serves as a focal point for public health preparedness and is the point of contact for health initiatives with the Florida Domestic Security Task Force and other health care partner organizations.With its background in preparedness and response for emergencies with public health implications prior to September 11th, the division also coordinates the responsibilities associated with the department's function as the lead agency for the Health and Medical Emergency Support Function. It works to ensure

enhanced preparedness and response to weapons of mass destruction and other emergencies with public health significance and seeks to assure that sufficient health and medical service resources are available to meet public health needs over a spectrum of man-made and natural events. Specific functions include: planning and coordinating public health system capacities related to bioterrorism and other events of public health significance across jurisdictions; monitoring progress, allocating resources, and developing amended work plans; providing oversight and monitoring through the Regional Domestic Security Task Force Health Coordinators; and informing and educating public health leaders and health care partners on bioterrorism preparedness. The division also facilitates the work of the Bioterrorism Preparedness Advisory Committee, which was created by the department to assist with oversight and implementation of Florida's public health preparedness and response to bioterrorism.

Division of Environmental Health. The Bureau of Water Programs regulates drinking water for residential, multi-family units, and limited use drinking water systems; supervises the Florida Safe Drinking Water Program for the 10 delegated counties; and provides technical services for drinking water protection in general, and drinking water security specifically. The FDOH Bureau of Laboratories is also required to establish and maintain laboratories for conducting radiological, microbiological, and chemical analyses of water samples from public water systems, which are submitted to such laboratories for analysis. FDOH has three regional laboratories, and numerous county health departments also have small laboratories that conduct bacteriological analyses. FDOH certifies both public and private laboratories that conduct drinking water analyses.

The FDOH laboratory has developed an emergency water testing kit that is used to collect samples to quickly check for contamination and potential for causing health effects. It is stocked at all 67 county health departments and with the seven regional domestic security coordinators. The sample containers in the kit allow for the FDOH lab to quickly test for approximately 200 chemical analytes and microbiological parameters. The FDOH lab follows chain-of-custody and approved testing methodologies. The Bureau of Community Environmental Health addresses both biological and chemical threats. Regarding biological threats, it specifically recognizes water sources as a dissemination method and provides regional waterborne illness epidemiology expertise. Regarding chemical threats, it recognizes multiple vectors and provides comparative expertise on the impact of chemical and biological agents (e.g. overt/covert acts, immediate/delayed impact, and decontamination).

Florida Department of Law Enforcement

Immediately following the terrorist events of September 11th, the FDLE was designated by the governor as the lead agency for domestic security. On September 14, 2001, the governor directed FDLE and the Division of Emergency Management to complete a comprehensive assessment of Florida's capabilities to prevent, mitigate, and respond to a terrorist attack. This process resulted in 26 recommendations in four primary areas: Emergency Services, Critical Infrastructure, Human Services, and Public Information and Awareness. These recommendations were ultimately accepted by the governor.

The first priority recommendation was to create seven Regional Domestic Security Task Forces that would play a key role in implementing a number of additional recommendations resulting from the assessment. Created by E.O. 01-300, each of seven FDLE regions operates a task force. Their goal is to coordinate domestic security efforts among local, state, and federal resources; coordinate training; coordinate the collection and dissemination of investigative and intelligence information; and facilitate the responses to terrorist incidences within each region.

Each Task Force has a standard organizational template organized under the Incident Command System Model and is co-chaired by an FDLE Regional Director and local Sheriff. Membership on the task forces includes: police chiefs, fire chiefs, emergency management directors, health and medical officials, federal state and local government officials, and private industry executives. The task forces are responsible to a statewide, multi-agency oversight board. The task forces include seven subcommittees, including Law Enforcement; Fire/Rescue; Emergency Management; Communications; Intelligence & Investigations; Medical Services/Health; and, Training/Education, Financial, and Joint Information. The responsibilities of the task forces include:

- improving Florida's ability to detect and prevent potential terrorist threats;
- collecting and disseminating intelligence and investigative information;
- facilitating and promoting ongoing security audits and vulnerability assessments to protect critical infrastructures;
- coordinating the delivery of training and supporting the purchase of proper equipment for public safety first responders and disaster response teams;
- improving Florida's response and recovery capabilities; and,
- promoting better public awareness of how suspicious incidents may be reported and how to respond should an emergency related to a terrorist threat develop.

As mentioned previously, the FDLE also operates the Florida Domestic Security and Counter-Intelligence Center, including the Statewide Domestic Security Intelligence Database that was created for use by all Florida law enforcement officers. The FDLE also maintains the Florida Infrastructure Protection Center, created in response to Team Florida 2000(Y2K), which is charged with anticipating, preventing, reacting to, and recovering from acts of terrorism, sabotage, and cyber-crime, as well as natural disasters. The center involves three components: an education and awareness campaign; a central analysis and warning point; and a computer incident response team. Finally, the FDLE is involved in *Secure Florida*, whose mission is to protect the citizens and economy of Florida by safeguarding information systems, reducing vulnerabilities to cyber attacks, and increasing responsiveness to any threat.

Specifically regarding drinking water, the FDLE led the assessment of the vulnerability of critical state infrastructure assets, including water, as part of the state's initial assessment immediately after September 11th. A new Florida Field Operations Guide (FOG) has been prepared by a multi-agency work group, which includes an "all hazards plan." The plan recognizes drinking water as a point of vulnerability.

Department of Community Affairs

The Florida Department of Community Affairs, Division of Emergency Management (DEM), is responsible for the coordination of emergency management and response across state and county agencies. Structurally, emergency management operations are organized into 17 Emergency Support Function (ESF) areas, with each area having a lead agency. Within DEM, the Bureau of Preparedness and Response coordinates training, exercises, and response planning at state and local levels in order to ensure proper response to disasters by emergency managers. The State Emergency Operations Center (SEOC) is the central point of this coordination and is activated to respond to disaster threats. Information about a potential emergency is directed through the State Warning Point (SWP), which utilizes a variety of communication technology, including telephones, satellite and radio equipment, and automated statewide pagers to notify response personnel across state agencies. The DEM also operates the Florida Warning and Information Network, whose mission is to reduce the loss of life by improving warning systems and developing safe shelters. This system provides infrastructure that can be accessed during a terrorism or health emergency.

In conjunction with the Public Information Offices of FDLE, the DEM makes regular and ongoing public advisory announcements to equip Floridians with an understanding of Florida's resources for dealing with threats to public safety, to raise awareness of potential threats, and to identify methods for reporting suspicious persons or activity that could be related to terrorism. On its web site is an explanation of "How Florida Should Prepare for Terrorism." It also sponsors "Community Emergency Response Teams"—local or neighborhood groups that receive special training to enhance their ability to recognize, respond to, and recover from a major emergency or disaster situation (per FEMA). Finally, it sponsors the "Florida Citizen Corp," whose mission is to help families and communities be safer, stronger, and better prepared to respond to any kind of disaster through personal responsibility, training, and volunteer service.

NON-GOVERNMENTAL RESPONSES

Florida Section American Water Works Association

Within two months of September 11th, the Florida Section of the American Water Works Association (FS/AWWA) took action to increase protection of Florida's potable water from terrorist actions. An important measure was to secure training for Florida utilities from terrorism, which was funded by the Office for Domestic Preparedness, Office of Justice Programs of the U.S. Department of Justice, and conducted by the National Emergency Response and Rescue Training Center based in College Station, Texas. Texas A&M University was selected to publish the training manual, entitled "Acts of Terrorism/Weapons of Mass Destruction (WMD) Preparedness and Response for Water and Wastewater Executives." Training is being provided in four categories: executive, distribution and collections, operators, and small systems. The training is being presented in six modules, which are:

Module 1: Terrorism/WMD threats to water and wastewater systems
Module 2: Assessing terrorism/WMD threats (vulnerability assessments)
Module 3: Reducing terrorism/WMD threats (mitigation)
Moduel 4: Responding to terrorism/WMD incidents
Module 5: Recovery from terrorism/WMD incidents
Module 6: Public and media relations in the event of terrorism/WMD incidents

Training commenced in February 2003 and will continue through June 2004.

In addition, FS/AWWA helped form the Florida Utility Anti-Terrorist Training Committee. This committee includes representation from the Florida Water Environmental Association, Florida Water Pollution and Control Operators Association, and Florida Rural Water Association.

Florida Rural Water Association

This association provides significant technical, educational, and other assistance to small public water supply systems. Regarding drinking water security, it provides information on the following issues: vulnerability assessments and emergency response plans; possible indicators of Al-Qaeda surveillance; security warning signs information; protecting community water assets; and protecting sensitive water security information, among other topics.

Florida League of Cities

Since many heightened homeland security measures are performed by municipalities, the Florida League of Cities, in conjunction with the Governor's Domestic Security Advisory Panel, prepared a manual entitled "Florida's Best Practices in Disaster Prevention, Response and Emergency Preparedness." The manual showcases the accomplishments of Florida's cities, and acts as a resource base of innovative ideas to encourage peer sharing. Profiles of 58 cities and counties are provided. Summaries of activities and contact persons are also provided.

Water Alliance

Sub-state initiatives on drinking water that have the potential to strengthen drinking water security include water supply authorities and alliances. Among other functions, these organizations provide a venue for distributing information and engaging vested parties in discussions on drinking water and homeland security.

Tampa Bay Water (TBW) is an example of such an authority. TBW is a special district created in 1998 by an interlocal agreement among member governments from Hillsborough County, Pasco County, Pinellas County, St. Petersburg, New Port Richey, and Tampa. Assistance was provided by the Florida Legislature and the Governor. TBW provides wholesale water to member utilities who in turn provide water to nearly 2 million people in the tri-county area. TBW has a Master Water Plan that combines new sources (e.g. desalinated seawater) with limited groundwater and aggressive conservation.

An example of an alliance is the Volusian Water Alliance. Created in 1996, the alliance is a governmental planning body in Volusia County in East-Central Florida. It is composed of representatives of the Volusia County government and each of the 16 cities in the county. As a voluntary consortium, the alliance has been formed to address water issues in the county, extending to quantity, quality, and infrastructure. The primary focus of the alliance is on the availability of water at economical prices and source protection of the Floridian Aquifer. They are considering the viability of desalinization.

Ultimately, homeland security measures taken in Florida illustrate the nature and diversity of activities that can be pursued to protect drinking water from terrorist events. Due to its status as a potential area for terrorist actions, and its experience with the physical and psychological effects of bioterrorism through the anthrax episode, Florida responded through the adoption of legislation and rules, and development of increased technical and management capabilities. Florida's approach is contributing to drinking water security and safety.

CHAPTER 6
PROMOTING OPPORTUNITIES FOR CONSTRUCTIVE INTERACTION [20]

The pace at which measures are being taken to protect U.S. citizens and interests from terrorists has only escalated since the events of September 11, 2001. A plethora of activities are underway at all levels of government. Significant progress has been achieved both within and between various agencies, academic institutions, and trade associations. With the foundation of laws, policies, and programs addressing homeland security and drinking water as a base, there are some emerging practices that directly relate to drinking water and others in fields separate from, but related to, the actual delivery of drinking water. With respect to drinking water, a major program is underway to address vulnerabilities at public water supply facilities, from the large systems to small systems that are also preparing emergency response plans. Beyond the efforts of the utilities and their government regulators, there are also emerging activities of other agencies, institutions, and organizations that share critical responsibilities related to drinking water protection.

From those practices, we have identified opportunities for constructive interaction between government, utilities, first responders, public health, trade and interest organizations, and the public. Interviews were conducted with those who are directly involved in homeland security, with those directly involved with drinking water, and with those involved in matters that potentially involve drinking water security. These interviews revealed opportunities for collaboration on water infrastructure, public engagement, public health, technology advancement, and emergency response planning and management. For each opportunity, we assessed the relationship to drinking water security, the challenges that are faced by related interests, the progress that has been achieved through parties with vested interests, and the legal authorities that provide the basis for action. Ultimately, homeland security goals can best be achieved through identifying synergies and maximizing economies of scale.

LINKING WATER INFRASTRUCTURE AND DRINKING WATER SECURITY

Drinking water security is fundamentally linked to the state of water infrastructure. The basic legal authority for addressing water infrastructure is found in the Safe Drinking Water Act; amendments to that Act taken in response to the events of September 11th provide the primary legal authority for addressing drinking water security. Additional linkages that provide the basis for encouraging constructive interaction between stakeholders include operational issues, such as physical maintenance of reservoirs and storage tanks, treatment plants, pumping stations, distribution lines, and other parts of the drinking water system. Other connections emerge from the shared need to fund multiple measures to protect drinking water for both homeland security and conventional needs. Finally, linkages emerge from the necessity for popular support of essential measures needed to ensure a safe and adequate supply of drinking water.

Mutual challenges also bridge water infrastructure issues and drinking water security. Conventional water infrastructure problems arise because the nation's public drinking water system are aging, resulting in deterioration of underground pipes and, in some cases, treatment facilities. At the same time, urban populations are growing significantly at the same time as the local water infrastructure is aging. Systems designed and built for a given population at the time of construction are now serving two to three times as many people as their design capacity.[21] Aging infrastructures can influence the quantity and quality of delivery of drinking water, and result in temperature variations, large swings in water pressure, vibration from traffic or industrial processes, and accidents. These can cause breaks in water mains and affect treatment efficiency and effectiveness, among other consequences.[22]

Similarly, terrorist actions can adversely impact water infrastructure. Crucial attributes for water infrastructure include the need for adequate quantities of water on demand; for delivery of water at sufficient pressure; and for safe, uncontaminated supplies. Physical damage caused by a terrorist action can affect both quantities and pressure. Water safety is susceptible to physical, biological, and chemical threats as well.[23]

Funding is a major challenge for both conventional and homeland security water infrastructure needs. For conventional needs alone, in 2001 the U.S. EPA released a survey of drinking water infrastructure needs, which

found that public water systems must invest $151 billion in infrastructure improvements over the next 20 years to continue providing safe drinking water to consumers.[24] With regard to homeland security, funding has been provided to support vulnerability assessments for larger public water supply systems. In addition, free vulnerability assessment and emergency response plan training for the medium-sized community drinking water systems is being provided, along with training and technical assistance to drinking water systems serving populations of less than 50,000 people. Yet, funding for implementation of measures to address identified vulnerabilities has not been fully addressed.

Progress in achieving drinking water security through water infrastructure improvements can be made by gaining public support of drinking water security, promoting the dual purpose of expenditures, and supporting mentoring relationships between public water supply facilities.

Gaining Public Support

The public recognizes the vulnerability of the drinking water supply to terrorist actions. A poll conducted among American cities in the summer of 2002 by the National League of Cities showed that water utilities are believed to be a potential target for terrorism. For cities with a population of 100,000 or more, 92 percent believed that water supply facilities must be secured in a city; for all cities, 82 percent believed that water supply facilities must be secure. Further, water supply facilities ranked the highest of all facilities needing to be secured. The public also recognizes conventional water pollution and drinking water contamination as a high priority. For example, in a National Survey of Public Perceptions of Environmental Health Risks, conducted by the Princeton Survey Research Associates for The Pew Charitable Trusts, over 55 percent of the population indicated that drinking water, which contains harmful or other materials, is a serious health threat.

Taken together, these surveys provide substantial evidence of the public's interest in drinking water protection and concern with drinking water security. While the public is relatively familiar with conventional threats to drinking water, they lack sufficient understanding of the nature of the terrorist threat. Using the public's knowledge of conventional threats to public health as a base, and building upon their emerging interest in homeland security, support—beyond simply interest—for actions required to ensure water safety from terrorist and conventional needs can be developed. To garner the public's support, efforts beyond traditional public education and marketing must be pursued. There must be an ongoing process of public engagement that involves more than an explanation to consumers of the need for rate increases. Rather, engagement requires a lifting of the veil over potential vulnerabilities to water safety. The public must be provided with a genuine assessment of the status of water quality and risks to that status. Engagement will occur when the public understands the net gain from expenditures, especially when the gains apply to both conventional and terrorist concerns. Further, engagement will follow from the public's participation in front-end decision-making regarding drinking water in their community and the avoidance of an "announce and defend" approach. Finally, the public must be informed as new measures are developed to ensure drinking water safety and security.

Promoting Dual Purpose

Progress towards addressing the physical needs of drinking water systems in ways that could achieve dual purpose is being achieved. For example, breaks in water mains could be induced by a system-wide "hammer effect," which can be caused by opening or closing major control valves too rapidly. This could result in simultaneous main breaks that might exceed the community's capacity to repair in a timely manner, causing widespread outages. Recognizing this vulnerability, some water systems have been incorporating valves that cannot be opened or closed rapidly. The assessment of dual-purpose opportunities can be informed through a system vulnerability assessment, though issues of confidentiality may also arise.

VULNERABILITIES OF SMALL SYSTEMS

Threats to small water supply systems were originally downplayed. Yet, due to a number of vulnerabilities, their risk level may be higher than originally contemplated. Small systems often lack security systems, full-time employees, and advanced detection and treatment technologies. They may suffer from conventional infrastructure needs. The circumstances facing small systems can be illustrated by an example from rural northwest Florida. The most serious vulnerability to this small city's water supply is a reservoir —in this case, a tank holding 200,000 gallons of water, which is made of concrete and constructed in 1937. Exposure is through open vents on the side and the door on the top, which could easily be used to release a biological or chemical agent. The city faces increased costs for maintenance because of the age of the system, and equipment (e.g., pumps) must be custom-made. Another serious threat to this small city's water supply, which uses groundwater as the source, is from the pipe leading to the pump that pulls the water out of the ground. If the pipe was breached and the system shut down, the water would be sucked back into the aquifer. Massive contamination of the underground source of drinking water could result. According to the city's water technician, installation of a backflow valve could help prevent that contamination.

Mentoring between Large and Small PWS Systems

Potential opportunities to address water infrastructure issues through economies of scale include collaborative problem-solving by small public water supply systems, which face their own set of risks (see sidebar). Another possibility involves large public water supply systems mentoring the smaller systems. For conventional needs, examples exist whereby large public water supply systems have assisted small systems with compliance issues. This approach could be applied for homeland security purposes as well.

ENGAGING THE PUBLIC IN DRINKING WATER SECURITY

The public's role in drinking water security is of vital importance. The legal authority that addresses public involvement in drinking water security is based on several statutes, including the Freedom of Information Act (FOIA), Safe Drinking Water Act (SDWA), and Emergency Planning and Community Right to Know Act (EPCRA). Since the events of September 11th, exceptions to and limits on access to information have been increased. While many of the measures needed to engage the public in drinking water security can be pursued without legislative action, some of these restrictions on access to information may need to be revisited.

As stated previously, virtually every public opinion poll taken in the United States regarding environmental concerns identifies water as a predominant concern. These concerns extend to the safety of drinking water and prevention of contamination from chemical and biological agents. Traditionally, the focus has been on the intentional release of weaponized agents by hostile sources. However, there are opportunities to leverage the public's pre-existing interest in drinking water safety to support the measures needed to protect drinking water from terrorist events.

In order to facilitate public support of drinking water security, several challenges must be resolved. One major issue is communication. Communication with the public about potential terrorist incidents is complicated, and includes the issue of public notice about the nature of the threat to drinking water as a resource that needs protection from terrorist acts. Currently, there are efforts by government and utilities to downplay or minimize that threat—such as the abundant comments stating that it is very difficult to covertly poison a reservoir because it would take many truckloads of poison to do so. While this statement may be partially accurate, it fails to accurately portray the very real risks to drinking water through acts involving the distribution system, and actually hinders the development of public support for funding drinking water security measures.

The issue of communication also involves the timing of notice for alleged terrorist acts. For example, utilities and their local counterparts are concerned about reporting every suspicious activity for fear that they will alarm people, create unnecessary hysteria, and reduce public confidence in the drinking water system. It has been stated that many incidents of deliberate sabotage or contamination go unreported because of fears of encouraging copycat acts or public overaction.[25]

Communication is also affected by the lag time between notice of an alleged incident and determination of an actual incident, due to the time it takes to culture the agent. At issue is whether to notify the public early about the possibility of an incident and risk unnecessary anxiety, or to wait until a problem has been confirmed, risking increased exposure. There is also concern that delay in warning the public can result in significant injury and perhaps death in the event that a true incident does occur. Public confidence in government is also at stake.

A second major issue involves public access to information, with the competing interests of preventing the awareness of vulnerabilities on the one hand, and of citizen participation in decision-making to correct those vulnerabilities on the other. For example, one of the Bush Administration's first actions regarding access to information was to restrict access to a broad range of scientific research by creating a category of "sensitive but unclassified" scientific research. As part of this action, federal librarians were required to remove CD-ROMs on public water supplies from public access. In addition, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Pub. L. No. 107-188 § 401 (June 12, 2002) (Bioterrorism Act) exempts drinking water security information from disclosure under the FOIA. The Bioterrorism Act provides further protection of information by limiting access to vulnerability assessments and by limiting the purposes that allow access. Further, because state FOIA laws are not generally superseded or limited by federal law, many individual states are taking action to restrict public record laws. A major dilemma regarding public understanding of the need for security measures and resources to meet those needs is the fact that there is limited access to vulnerability assessments, which identify homeland security needs. Yet, even though vulnerability assessments are exempt from disclosure through federal public records requests, utilities do have the discretion to make this information available. Information disclosure can serve to encourage public support for the identification of water infrastructure needs and the justification for expenditures.

A third major issue involves public awareness that biological, chemical, and radioactive agents used for weapons of mass destruction may also be released into drinking water sources by non-hostile sources. For example, several agents (e.g., *cryptosporidium*) that are listed as having potential for weaponization are also contaminants of concern for conventional purposes. Failure to address both conventional and homeland security releases of these contaminants into drinking water will hinder the credibility of measures taken to protect drinking water in general.

A fourth major issue is the general lack of understanding by environmental organizations about the multidimensional nature of homeland security and drinking water. For the most part, the focus of environmental organizations has been on the role of the government in responding to homeland security, and the environmental implications of government actions taken in response to homeland security needs. For example, great concern has been expressed by environmental organizations over legislative proposals to exempt the military from environmental laws for homeland security actions. Environmental organizations have also engaged in efforts to limit the production of chemical, and biological agents that may be weaponized.

Yet, the vast majority of environmental organizations, especially those at the state, and local level, are unfamiliar and unengaged in measures to protect drinking water security from terrorist acts. There is a lack of awareness of the different types of homeland security issues that affect the environment. These include not only the terrorist act itself, such as the release of a biological, chemical or radioactive substance in a drinking water source, but also site-specific actions taken in response to a terrorist event. Site-specific actions include remediation and cost recovery; government programs or projects developed as a systemic response to homeland security needs; and the regulation of specific biological, chemical and radioactive agents that may become weaponized for a terrorist act.

Organizations operating at the international, national, regional, state and local levels have undertaken broad measures to protect drinking water for many years. To a large extent, these organizations are not aware of the potential linkages between their traditional water quality and quantity concerns and homeland security.

Progress is being achieved in overcoming these challenges that hinder public support for drinking water security. First, innovative approaches using existing communication vehicles are being developed that balance the need for public information and protection of sensitive information. Opportunities to strengthen public support also are available through general education and through targeted stakeholder education. Finally, insight into public engagement can be garnered from international experience, especially that of Israel, which has grappled with these issues for years.

Refinement of Existing Vehicles

Several opportunities are available to refine existing vehicles for public notice and outreach. Under the auspices of their ongoing emergency planning and community right-to-know programs some states, such as Florida and South Carolina, are exploring opportunities to achieve a balance between public notice and information restriction. Rather than restrict entire categories of information that were previously posted on government web sites, these states are establishing requirements to obtain information on a case-by-case basis.

Public cooperation in drinking water security can also be expanded through Consumer Confidence Reports (CCR), which are vehicles for communicating with the public the status of their public water supply system. CCRs provide an opportunity to engage the public in a dialogue and collaborative decision-making to improve the drinking water security. While PWS operators have expressed concern about the risk of evoking an emotional response from consumers when concerns arise with water quality, these concerns can be addressed through the tone of the information presented.

General Public Education

Engaging the general public in drinking water security can produce numerous benefits. When the public understands the process, challenges, and balance of competing interests that government must achieve, they become part of the process and less inclined to arbitrarily react against measures. Shared information results in less public opposition to requests for rate increases to pay for the updated equipment and services necessary to address homeland security for drinking water.

Public Engagement Through Targeted Stakeholder Education

An untapped opportunity to build public support for drinking water security is engagement of specific stakeholder organizations, including environmental organizations, environmental justice networks, smart-growth advocates, and faith-based organizations.

Environmental organizations and their networks provide direct avenues for engaging people who are active in drinking water protection. Water coalitions exist in many states, and others operate on a national level. Philanthropic organizations, such as private foundations, that support environmental organizations are provide a

mechanism for reaching large numbers of organizations. Even though there may be disagreement on conventional drinking water matters, there is an opportunity and need to develop mutual goals and objectives that aspire to prevent contamination of drinking water resources from intentional and accidental releases of biological, chemical, and radioactive substances. Tremendous synergy with strong drinking water advocates can be achieved through identification of issues of mutual concern.

Related to, but different from, environmental organizations are the environmental justice and grassroots organizations that operate on a local level. Many of these groups have experience in addressing drinking water contamination and are familiar with the challenges to drinking water safety. Further, these groups represent diverse racial, ethnic, and economic constituencies. There are over 3,000 such organizations and advocates in the United States.

Another avenue for constructive interaction involves linkages between homeland security and smart-growth advocates, including both antagonistic and symbionic relationships. Immediately following the events of September 11th, there was a strong constituency arguing that urban sprawl might provide safeguards against terrorism by reducing the density of cities and suburbs. On this model, dense city neighborhoods could be perceived as an easy target and the suburbs as a haven from terrorism. Others responded that the smart-growth vision of more energy efficient, environmentally sensitive, livable communities provides a cogent long-term response to reduce our dependence on foreign oil, and thus strengthen national security.

Smart-growth issues also relate to the impact of homeland security actions on sprawl, such as deciding the location of new government departments or agencies. Recognizing the symbolism of homeland security offices, smart growth advocates promote the location of such offices in areas that do not promote sprawl and traffic congestion. Smart growth-advocates have also expressed concern that the emphasis on public health after September 11th dwarfs the attention on other public health menaces, including sprawl, which have caused greater adverse health problems than terrorist threats. Most recently, controversies are erupting between smart-growth advocates and emergency responders. For example, firefighters are challenging the increasing use of speed-bumps to affect traffic flow and enhance liveable communities because of the impact on response time for emergencies. At the same time, symbionic relationships are developing between smart growth and homeland security. For example, land conservationists are working with the Armed Forces to preserve green spaces around military bases. The military gains from better control over the land surrounding the bases while the conservationists are able to preserve wildlife habitat in urban and rural areas. While these issues are complicated, they nevertheless indicate recognition of homeland security as an issue of interest to a broad and active constituency of smart-growth advocates.

Another potential opportunity to build public support for drinking water security is through the faith community. Again, there is a growing interest in drinking water by the faith community both as a symbolic spiritual concern and as a public health concern. The emerging focus of this community is on conventional drinking water issues, which extend to both quality and quantity issues, but have not yet included homeland security matters. There remains an urgent need to expand the growing interest of the faith community to include water security for terrorist actions.

Israeli Experience in Public Engagement in Drinking Water

While the United States has intensively addressed homeland security following the events of September 11th, other countries have confronted this challenge for a much longer period of time. Lessons can be learned from the experience of these countries, especially as it relates to the implementation of measures that produce homeland security. Important opportunities can be garnered through analyses of Israel's long-standing experience with public involvement in drinking water security.

Within Israel, there is significant interest in public accountability for drinking water quality. Specific interests include implementation and enforcement of drinking water monitoring and reporting regulations; public-interest litigation and legislative reform; right to know and public awareness; and media organizing on water quality. It is recognized that these issues relate to, and must be integrated with, domestic homeland security needs. In the overall scheme of security needs, environmental issues are comparatively minor. Yet, drinking water quality receives significant attention due to concerns with both quantity and quality. Response to suspected contamination from both intentional and unintentional acts is rapid. When a threat is suspected at a well field or public water supply system, immediate action is taken to isolate the suspected contamination. The specific supply is accessed only after a thorough assessment has been made to determine whether the threat is real or has been abated.

Additional insight regarding public engagement in drinking water security can be garnered through an assessment of the role of water in the Middle East conflict. Shared water resources include both surface water (riparian countries and territories to the Jordan River include Israel, Syria, Jordan, and the Palestinian Authority) and

groundwater (the West Bank overlies three major aquifers, and approximately 30 percent of Israeli water originates on the West Bank). Natural watershed boundaries of the region are inconsistent with the political boundaries of the countries and territories. Water has been a contentious issue in the negotiation of treaties (e.g., The Jordan-Israel Treaty of Peace of 1994), in peace talks (e.g., Arab-Israeli), and in the outbreak of hostilities (e.g., exchanges of fire between Israel and Syria in the mid-1950's and 1960's). Yet, it has been argued that no territory to date has been retained simply because of the location of water. In addition, there is a belief that solutions to water conflicts have focused on creative joint management of the resource, rather than insistence on sovereignty. Accordingly, increased attention on resolution of water issues may prove useful for broader security issues.[26]

BUILDING BRIDGES BETWEEN PUBLIC HEALTH AND DRINKING WATER SAFETY

Public health is an essential component of drinking water security. Federal environmental statutes that govern drinking water, such as the Safe Drinking Water Act and the Clean Water Act, specifically recognize the need to protect human health. Federal homeland security authorities also recognize drinking water (as part of water) and public health (as part of emergency services) as "critical infrastructures" in Presidential Decision Directive 63. State laws also provide significant legal authority for addressing the public health components of homeland security; state authority on drinking water security also exists. However, there remains an important need to link public health and drinking water authorities. The Model State Emergency Health Powers Act, which provided the basis for state legislative action, focuses on traditional public health issues, such as health planning, surveillance, protection of humans and property, and communication. The model should be expanded to include environmental issues that also affect public health. Nevertheless, many measures promoting constructive interaction can be pursued based on existing authority.

The integration of drinking water safety with public health protection can be founded on the important role of the public health community in addressing acts of terrorism targeted at water supply systems. This role ranges from mitigating illness and injury to providing early detection of disease outbreaks to authorities. The current massive undertakings to address the public health implications of homeland security also share elements with drinking water safety. First, the public health community is confronting core infrastructure problems that have plagued public health as a means to strengthen protection against terrorist activities. This is similar to the recognition of the dual purpose of expenditures for water infrastructure and drinking water security. Second, efforts to strengthen surveillance for disease outbreaks associated with a terrorism event include, to a certain degree, waterborne illnesses.

Numerous challenges to addressing the public health impact of a terrorist event involving drinking water have already been identified. In general, these challenges include early detection of intentionally caused chemical or microbial contamination of water; state and federal planning for the investigation of these events; surge capacity for rapid emergency expansion of water-testing laboratories; and establishment of secure channels for crisis communication between water utilities, state and local health agencies, U.S. EPA, FBI, and other federal partners. Additional challenges involve research needs, including determining the length of time priority agents can survive in water; the susceptibility of priority agents to common water treatments; and the quantity of water that must be ingested by an individual to become ill.

Efforts to address these challenges precipitate additional problems. For example, rapid detection of a terrorist event depends on ongoing disease surveillance activities at state and local health agencies. Many currently lack adequate human and laboratory resources for disease surveillance, including trained epidemiologists to investigate outbreaks and laboratory capacity to test specimens for a full range of pathogens. Another major dilemma is finding the capacity to process and test huge numbers of water samples. In addition, rapid tracing and clean-up of a contaminated water system or water source invokes the need for working partnerships between water utility staff and public health workers, including laboratorians, epidemiologists, and environmental health scientists.

Another serious issue from the public health perspective is the relatively high focus on weaponized airborne agents compared to waterborne agents. To a large extent, airborne agents have received priority attention for a number of reasons. First, public health is underfunded and therefore allocates its limited resources to issues it believes pose the greatest threat. The lack of a publicized disaster involving drinking water has rendered drinking water security a lower priority. Second, generally (with some noted exceptions) drinking water is governed by environmental departments rather than health departments. The role of health agencies in drinking water security is therefore undefined. There is an important need to expand this focus to address issues such as whether selected priority water pathogens, including those on the critical agents list (e.g., smallpox virus, *Bacillus anthracis*, *Yersinia pestis*, and *Clostridium botulinum* toxin), can survive in natural bodies of water, and in water treated with

chlorine, monochloramine, ozone, chlorine dioxide, UV light, or common filtration methods.

An additional concern is with state and local public water supply programs that are regulated by an agency other than the environmental regulatory agency that is the delegated program under the Safe Drinking Water Act. These programs may or may not be included in the activities designed to address drinking water security, extending from regulatory to training measures. They must nevertheless receive guidance and assistance as part of drinking water security programs.

Finally, as expressed in other areas, effective and secure communication with the public, first responders, healthcare providers, the news media, state and local health agencies, and federal agencies is a major challenge to protecting the public health from terrorist events.

Progress in achieving drinking water security through public health can be secured through improvements in syndromic surveillance; expanding public health authorities at the state level; engaging healthcare practitioners in waterborne disease response; linking drinking water with food safety; and facilitating interaction between local health departments and public water supply utilities.

Improvements in Syndromic Surveillance of Waterborne Illness

Responses to the challenges posed by terrorist events impacting drinking water include an increasing recognition that these challenges can be addressed through extensive research and analysis conducted by federal and state agencies, associations, and water utilities, among others.

This progress is illustrated by the New York Academy of Medicine's National Syndromic Surveillance Conference in 2002, attended by over 400 public health practitioners, academics, physicians, computer scientists, statisticians, and lawyers from all over the world. Topics that were covered included: syndromic surveillance within the context of national and local public health; model syndromic surveillance systems; temporal and temporal-spatial outbreak detection; potential non-traditional data sources; and legal mandate and confidentiality, among others. Of particular importance to homeland security and drinking water is the capacity to integrate military and civilian indicators of health data. These include absenteeism, hospital emergency room, over-the-counter sales, doctor visits, animal health, diagnostic labs, pharmacies, and hotlines. Diseases of interest to drinking water include gastrointestinal illnesses. The conference proceedings will be published in the *Journal of Urban Health: Bulletin of The New York Academy of Medicine*.

Additional progress is being achieved through implementation of these approaches, such as those underway in Ontario, Canada.[27] There is also new software (e.g., SaTScan™) that analyzes spatial, temporal, and space-time point data using the spatial, temporal or space-time scan statistic. It can be used to evaluate reported disease clusters to determine statistical significance, to perform geographical surveillance of disease to detect areas of significantly high or low rates, and to perform repeated time-periodic disease surveillance for the early detection of disease outbreaks.

In addition, the Centers for Disease Control and Prevention produces "Surveillance Summaries" which address different topics. Through the MMWR, there is a Surveillance Summary for Waterborne Diseases, with the largest category addressing acute gastrointestinal illnesses.

Expanding Public Health Authorities at the State Level

Progress has also been achieved through the development of model state public health laws. The Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities drafted the Model State Emergency Health Powers Act at the request of the Centers for Disease Control and Prevention. This Model Act provides state actors with powers to detect and contain bioterrorism or a naturally occurring disease outbreak. Legislative bills based on the Model Act have been introduced in at least 43 states, and the law has been adopted in whole or in part by 32 states and the District of Columbia, who have amended quarantine laws that allow government to take strong measures to address diseases, including quarantine and involuntary vaccination. In addition, the Turning Point Public Health Statute Modernization Collaborative prepared a Model State Public Health Act to serve as a tool for state, local, and tribal governments to use in revising or updating public health statutes and administrative rules. While these laws did not specifically address waterborne diseases, there is interest in producing another model that would specifically include environmental issues such as drinking water protection.

Responding to emergencies

Local health departments are authorized, in some states, to take action when there is information that a contaminant, which is present in or likely to enter public or water supplies, may present an imminent and substantial danger to the public health. This action can include conducting investigations of complaints and notifying potentially affected consumers. With their familiarity with the population, utilities, first responders, and other local conditions, local health departments are in an excellent posi-

tion to respond to contamination of drinking water supplies by terrorists.

Engaging Health Care Practitioners in Waterborne Disease Response

Health care professionals have a growing interest in waterborne diseases that may be caused by biological and chemical contaminants. For example, the Florida Nurses Foundation, in concert with the Environmental Law Institute, is developing a project to engage nurses in prevention of waterborne diseases and drinking water protection. Nurses assume a powerful role in society and their perspective on health influences individual patients, families, and communities as a whole.

A U.S. EPA supported web site is an important resource to facilitate participation by healthcare providers in drinking water security. The web site helps healthcare providers recognize and manage waterborne disease and the health effects of water pollution from natural or intentional water contamination. This web site is free and available 24 hours a day, seven days per week. It provides clinically relevant information detailing the diagnosis and management of waterborne diseases, and includes a repository of physician anti-terrorism preparedness resources. The web site also facilitates outreach and training for medical practitioners.[28]

In addition, academic institutions, such as schools of medicine and schools of public health, maintain centers on bioterrorism and homeland security. These centers are conducting training for physicians, nurses, and other allied health professionals through satellite broadcasts and CD-ROMs. Drinking water is included to a limited degree in the training. They are also involved in curriculum development for medical and nursing students. The focus of the curriculum development is general, with mention of drinking water as one of many points of vulnerability.

Linking Drinking Water with Food Safety

Since many food-borne pathogens are also waterborne, there is the opportunity for shared capacity for disease surveillance and outbreak response. There remains a need to identify the organizations involved in food protection, including government and NGOs, and to evaluate their goals and functions. From this analysis, opportunities to prevent and respond to waterborne incidents from terrorist acts could be clarified.

Facilitating Interaction Between Local Health Departments and Public Water Supply Utilities

The capacity to promote drinking water security through surveillance of health outbreaks can be increased through linkages with health planners. The CDC has awarded grants through state health departments for regional planning. The public health units receiving the grants often correspond to regions developed for domestic security and address environmental matters. Thus, these local programs have an integrated perspective that includes health, environment, and security. The regional planning councils also address Certificate of Need determinations for hospitals. Education of these planners can expand the understanding by a broad group of health care providers of drinking water security needs.

TECHNOLOGICAL ADVANCES AS A CATALYST FOR IMPROVING DRINKING WATER SAFETY

A significant outgrowth of the response to homeland security is a dramatic increase in efforts to improve the technological abilities and capacity for responding to the release of biological, chemical, and radioactive agents from a terrorist event. The legal authorities that involve technologies associated with drinking water security are found in several environmental laws, including the CWA, SDWA, RCRA, CERCLA, and TSCA. Many measures to enhance collaboration among stakeholders can be pursued under these existing authorities. For example, SDWA governs both public water supply systems and underground injection facilities that discharge municipal waste into underground sources of drinking water. Technologies for detection and treatment are often similar for both drinking water and wastewater. Advances in technologies can improve drinking water safety for both conventional and security needs. Other measures may require amendments to existing authorities. For example, amendments to discharge and remediation standards and chemical review processes may be necessary to include coverage of weaponized agents. Efforts to expand the list of regulated substances would invoke the need for dialogue between stakeholders, and ultimately strengthen capabilities to address the production and release of weaponized biological, chemical, and radioactive agents.

Advances in technology that have escalated since the tragic events of September 11th provide a basis for considering changes to legal authorities. These advances extend to monitoring, detection, and treatment of agents, along with communication to ensure informed decision-making. Despite this emergence of improved technologies, many states are making critical policy decisions that affect

the quality of the drinking water supply based on older technologies that do not include advancements achieved through homeland security research. There is an urgent need to integrate technology advances with ongoing government decision-making on drinking water protection.

There are various types of technological advances required to sustain effective drinking water security. There is the need for early warning capabilities—while there are ample such devices for air, an urgent need for waterborne incident devices has been expressed. The dilemma is due in part to the fact that emergency services must rely on laboratory testing, which involves a period of time to culture agents. Another time lag results from the need to send water samples to several laboratories, such as laboratories serving the environmental, public health, and consumer services agencies, for independent confirmation of results.

Another challenge stemming from conventional drinking water protection that is being addressed through homeland security involves the ability of technologies to detect and treat emerging pathogens and other contaminants that may be released into drinking water sources and supplies. From a conventional perspective, there is a growing recognition that current technologies face difficulties in evaluating the full extent of emerging pathogens and other contaminants in source water, such as pharmaceuticals, and in treating all those contaminants that pose a risk to public health. According to the National Academy of Sciences National Research Council, testing and treatment for certain biological agents, their toxins, and other exotic contaminants have not been developed.[29] For example, studies in the United States have found viruses in 20-30 percent of the groundwater where coliforms were not predictive of viral contamination.[30] There are also concerns that a genetically engineered enteric organism may now enter the water cycle and waste stream.[31]

An additional challenge involves the need for guidance on rapidly emerging technologies. Since September 11th, many vendors are offering a plethora of new detection technologies, but state and local agencies lack the time and resources to evaluate them and provide guidance on those technologies that are appropriate and satisfactory. Accordingly, they have indicated a need for assessment of technologies and a clearinghouse to convey this information.

A related challenge that hinders the use of emerging technologies for both conventional and security needs is the lack of standard methods delineating the use of the new technology. Without these standard methods, the new technologies cannot be required nor enforced.

Yet another challenge involves prediction of pathways for contamination beyond the water system itself. Concerns have been raised regarding monitoring wells as a possible conduit for the release of a biological or chemical contaminant into underground sources of drinking water. For example, groundwater monitoring wells associated with abandoned landfills near public water supply wells could be used to inject weaponized agents that would contaminate the aquifer serving as the source of the drinking water.

In addition, tracking of agents that may be used in terrorist incidents is a major challenge. Local government officials have expressed concern that there needs to be the capacity to identify the nature and source of weaponized agents that may be used to contaminate drinking water. This information includes manufacturing, distribution, and disposal information, and should be made available to law enforcement, public health, emergency management, and other government entities.

Finally, technology issues relate to alternative treatment approaches. For example, a major challenge involves the capacity of home-purification filtration devices to protect against a terrorist act on water supplies. At issue is whether the devices can remove the agent, whether the agent is sensitive to chlorine and other common disinfectants, and whether it can be deactivated by boiling.

A major opportunity to promote constructive interaction emanates from technical challenges that are shared between both homeland security and conventional drinking water needs, which also promotes the dual-purpose use of resources. Progress in achieving drinking water security through technology advances can be secured through improvements in detection capabilities for conventional and security pollutants, improvements in surveillance information capacity, identification of mutual needs within natural gas and remediation response experts, advancing tools for community surveillance, and coordinating with natural disaster response.

Improvements in Detection Capabilities for Conventional and Security Pollutants

Natural, deliberate or accidental human-caused conditions that threaten human health range from the deliberate dumping of biological or chemical contaminants by a hostile source, sewage treatment plant failures, oil/chemical spills, harmful algae blooms, pollutants, and pathogens in runoff. Detection methods used to address these events are rapidly evolving. For example, the Human Genome Project, which has provided the complete sequencing of the genetic information that makes up a human being, has facilitated the development of tools for characterizing microorganisms that may be used in a terrorist event or that may otherwise be released into drinking water. This genetic assessment can lead to knowledge

about the potential for the agents to cause waterborne disease.

Identification of the microbial hazard, occurrence, transport, and control are issues that can be addressed through the new methods that are being developed. Types of methods include:

- Source tracking, a molecular technique used to identify the source of a contamination and thereby facilitate its containment;
- Special indicators, such as molecular fingerprints, host-specific genes, and chemical constituents, that can provide direct evidence of source origin;
- Pathogen identification and quantification, which uses polymerase chain reaction to overcome the challenge of non-cultivatable pathogens, to provide direct evaluation of microbes in the distribution system, ground waters, and surface waters;
- Waterborne genomics, which provides for the sequencing of more than 16 waterborne microorganisms, thus allowing the identification of the complete pathogen loading of virulence genes, resistance (persistence) genes, and potency genes; and,
- Rapid assessment through new instrumentation, such as biosensors that use liquid-core waveguides, which will help identify microbial contamination within 20 minutes.

These advanced techniques, combined with standard culture methods with enhanced polymerase chain reaction detection methods, can help reveal the presence of bacteria not previously associated with the transmission of waterborne diseases.[32]

Opportunities to implement the emerging technologies are increasing. A major accomplishment is U.S. EPA's Lab Capabilities Compendium, which will consist of information regarding laboratories capable of assisting water utilities in analyzing water samples for contamination. It will address a laboratory's location, contact information, and a description of its basic capacity, capabilities, and instrumentation, among other functions. In addition, it will provide information on state public health, state environmental, private, and some federal laboratories. The compendium will be available through the WaterISAC, state-specific print-outs through associations, a password-protected website, and by other means.

CDC is also involved in laboratory capacity expansion measures for both biologic and chemical agents. For biological agents, CDC is developing a consortium of public health, hospital-based, food testing, veterinary, and environmental testing laboratories to participate in the Laboratory Response Network (LRN). The LRN is a consortium of laboratories that provides immediate and sustained laboratory testing and communication in the event of public health emergencies, particularly in response to acts of bioterrorism. The LRN is composed primarily of state, local, and federal public health laboratories. For chemical agents, CDC is developing a nationwide laboratory capacity that provides rapid and effective analysis of clinical specimens (e.g., blood and urine) for chemical agents likely to be used in terrorism. CDC is also addressing laboratory analyses of food specimens for chemical agents likely to be used in terrorism. Within these parameters, CDC is providing funding to deploy mobile labs, which could contribute to the analysis of waterborne incidents.

In addition, some states have surveillance and remediation programs for contaminated drinking water supplies serving unregulated use (e.g., private wells). The Water Quality Association, which is the trade association for water treatment devices, may also serve as a vehicle for increasing awareness of improved detection devices.

Finally, the U.S. EPA has taken measures to help utilities, local and state governments, and others better assess the rapid emergence of new technologies that may be useful in detecting or avoiding biological or chemical threats. It has established a Environmental Technology Verification (ETV) Program for water security that develops testing protocols and verifies the performance of innovative technologies. It was created in response to the need to accelerate the entrance of new environmental technologies into the marketplace.

Improvements in Surveillance Information Capacity

Progress is also being made through innovative technologies that are being developed to address early warning capabilities from surveillance information. These include:

- Timely detection and/or prediction of significant conditions in drinking water;
- Sensor and information technologies that can provide tools needed to continuously monitor water quality variables, transmit monitoring data in real time, validate, display and interpret the data, and predict the future state of these variables; and
- Categories of technological improvements, including remote real-time monitoring, network modeling, and large-scale monitoring systems for source water protection.

The U.S. EPA's efforts to support the development of two computer applications illustrate progress made in this area. One model is the PipelineNet, which tracks contaminants within a water distribution system. It relies in part

on the pipe network hydraulic model (EPANET). The second model is RiverSpill, which tracks the fate and transport of contaminants in surface water using real time stream flow date provided by the U.S. Geological Survey. These computer applications are available to utilities.

Identification of Mutual Needs With the Natural Gas and Remediation and Response Sectors

Progress achieved by other sectors involved in activities that affect the environment can benefit drinking water security. The natural gas industry has produced tools that may help improve water security. For example, methodologies are available to evaluate vulnerability points for pipelines. Critical paths are determined that assist in the quantification and systemization of risk information and guide the allocation of resources for risk abatement. Collaborations between those seeking to protect drinking water and natural gas can identify synergistic opportunities for increased protection of both resources.

Communication with small drinking water systems can be strengthened by engaging the consulting firms that provide technical assistance to these systems. These firms conduct analysis of the water and provide feedback to the operators and owners of the systems. Usually, the consulting firm handles all the technical issues, including sampling. This can hinder local officials' understanding of the technical issues associated with drinking water security. However, these firms also serve as a focal point to distribute information and encourage engagement in homeland security matters.

Tracking of weaponized agents can be improved by exploring elements of the cradle-to-grave tracking system established pursuant to RCRA, which could be used as a model to assist law enforcement officials and the CIA. The role of U.S. EPA's National Response Center, which provides investigation and support services for CERCLA and RCRA contamination events, is another possible source of relief for environmental consequences of terrorist events.

Advancing Tools for Community Surveillance

There are emerging technologies that will increase engagement of the public while concurrently providing time-sensitive information. For example, equipment has been developed to allow participation by community members in monitoring for environmental exposures in their neighborhood. One device to do this is the "Zikua," which is a palm-size device for measuring ground-level ozone. To measure outdoor ozone levels, a chemically-treated test strip is exposed to the air for one hour and then inserted into the device. The test strip turns a color during exposure. The monitor translates the color change on the badge into an electronic ozone reading in parts-per-billion, a standard unit of measurement. The use of this device serves both to provide data and also to engage the public in measures designed to improve the health and safety of the community. Similar measures could be developed to address water security.

Linkage with Natural Disaster Response

Major progress in drinking water security has been achieved through linkages with natural disaster responses. Drinking water systems are vulnerable to both manmade and natural threats and disasters. Earthquakes and terrorist attacks have many characteristics in common: they are almost impossible to predict and can cause major devastation and confusion. Japan has had experience with both natural disasters and terrorist incidents. Response to the Kobe City earthquake produced proactive measures that can protect drinking water from both of these threats.

The Great Hanshin-Awaji Earthquake in 1995 inflicted heavy damages, including major loss of life, destruction of buildings, and water supply, power, and sewage facility failures. Unexpected incidents that resulted from the earthquake were dire shortage of water, a lack of water wagons, frequent pipe breaks, and very slow progress in restoring water from the city's various sources. An assessment of existing facilities that proved effective in reducing damage included emergency shut-off valves, a remote telemetry/telecontrol system, and earthquake resistant pipes.

In response to this disaster, Kobe City established a long-term plan that includes earthquake-resistant facilities, an emergency water storage system, an earthquake-resistant skeleton of pipes in the service area; large-capacity transmission mains that have storage capacity; earthquake-proof buildings, a remote monitoring capacity, and earthquake-resistant materials, such as piping. The overall goal of the Kobe City water system is to construct a highly protected system that would remain operational at some minimal level in the event of partial destruction. The impact on a water system from a terrorist attack can be similar to that of an earthquake, which can include physical destruction of water mains and pipes; loss of water resources through contamination; and destruction of treatment facilities. Accordingly, opportunities to increase drinking water security through natural disaster preparedness should be maximized. These include technological adaptations (e.g., transporting large amounts of water over faults); institutional adaptations (e.g., mutual aid and assistance plans, communications, planning); and biological and chemical countermeasures (e.g., chlorine residuals in distribution system).[33] Finally, some large utilities are

addressing the issue of detection, as are some clusters of smaller utilities.

WATER SECURITY LESSONS FROM EMERGENCY PREPAREDNESS: PLANNING, MANAGEMENT, AND RESPONSE

Even prior to the events of September 11th, significant measures have been in place for emergency preparedness, which includes planning, management, and response for both natural and accidental man-made disasters. The legal authority governing emergency planning and management, along with the community's right-to-know, is founded primarily on EPCRA.

Through EPCRA there exists an outstanding nationwide network of emergency response personnel that includes both State Emergency Response Commissions for Hazardous Materials (SERCs) and Local Environmental Planning Committees (LEPCs). LEPCs, which are discussed more fully below, are appointed by SERCs for each emergency planning district. Each committee must have a range of interests represented, including local and state government, the private sector, environmental organizations, and first responders. The LEPCs must complete emergency plans and review plans at least annually. As part of this effort, they must evaluate resource needs with respect to plans and recommend additional resources needed. Another emergency response statute, the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (U.S.C. Title 42, Chapter 68 as amended by PL-103-181, 103-337, and 106- 390), authorizes the federal government to respond to disasters and emergencies in order to help state and local governments protect human health, safety, and property.

While the laws governing man-made disasters focus heavily on accidental or negligent releases of hazardous materials, the Stafford Act focuses on natural disasters. There was an emerging interest in the intentional releases of harmful agents even before the events of September 11th—for example, the Florida SERC was approached by firefighters about shouldering "antiterrorism" responsibilities several years prior to September 11th. At that time, the SERC rejected the notion of assuming an additional focus because it did not want to dilute its primary function of chemical preparedness. Yet, this request prompted a review of areas of mutual interest between security and emergency management functions. After September 11th, the Florida SERC recognized its value in the field of homeland security, but similar to the LEPCs, its precise role is still evolving. It has been noted that after September 11th, four of the eight states in EPA Region IV have reactivated their SERCs.

Ultimately, while these laws provide the basis for many measures facilitating constructive interaction, their focus on emergencies involving hazardous materials and natural disasters limit their full potential to respond to terrorist events affecting drinking water and other natural resources. Therefore, amendments to these or other authorities may be useful in clarifying the relationship between emergency response for accidental releases and those involving intentional terrorist acts.

Even with an excellent core system designed to address emergencies, significant challenges remain. These challenges involve a wide list of responders, including law enforcement, fire services, hazardous materials teams, search and rescue, public works, and their respective communications and notifications systems. While a full assessment is beyond the scope of this report, several issues that particularly relate to drinking water security are highlighted.

An important challenge involves the need to bridge the unique focus of various responders. For example, the focus of law enforcement is predominantly on actions that occur after a terrorist event, rather than on prevention. And the role of emergency planning and management may not involve addressing a hostile chemical incident as a site security issue because of the belief that this issue is best addressed through law enforcement. Finally, firefighters may not be involved in drinking water security directly, but they can suffer serious exposure if their water source for responding to an incident has been contaminated with weaponized biological or chemical agents.

Another challenge stems from concern with diluting, diverting, and overwhelming the core mission and capacity of hazardous materials emergency response beyond their legislated duties, and overwhelming an effective system. There is now recognition of SERCs and LEPCs roles as part of the emergency response planning function for public water supply systems, and interest by the SERCs and LEPCs in expanding efforts beyond the traditional focus on chemical preparedness. However, there remains an important need to provide training, technical assistance, and funding to enable SERCs and LEPCs to maximize their potential to assist in the homeland security process.

Challenges were also noted specifically regarding drinking water security and emergency management. Initially, concern was expressed that the provisions in the amended SDWA requiring vulnerability assessments and links to emergency response plans were drafted without clear involvement of the emergency management players. It has also been expressed that in many cases grants to address these vulnerabilities were assigned to environmental agencies without the awareness of the emergency management agencies or personnel. In addition, issues arise as

to compliance and documentation. There is also a lack of definition of key terms, such as chemical site security and biological site security. Additional concerns relate to continuity of the operation plan; coverage based on number and location of the employees; responsibility for reviewing the ERP for drinking water; and determining the application of Section 302 of EPCRA, and its relevance to the LEPC plan. Finally, it has been expressed that the overall link is only as good as the first link in the Response Management Plan (RMP). For example, the RMP process relies on Safety Management at OSHA. But, there is concern with accountability in that process, because there are no reporting requirements and only the possibility of inspections.

Opportunities for improvement within the emergency management process that may affect drinking water security relate to homeland security coverage by chemical facilities. For example, less than one-half of the states sought delegation for Section 112(r) of the Clean Air Act, regarding risk management plans and off-site consequence analysis. Thus, EPA Regional Offices are managing the program. Of particular interest are facilities that store chlorine and sodium, which include public water supply systems.

Progress in achieving drinking water security can be achieved through collaborations with emergency planning and management personnel, with first responders, and with community disaster teams.

Collaborations with Emergency Planning and Management Personnel

A major opportunity for collaboration involves the Local Emergency Planning Committees and the State Emergency Response Commissions.

Since their formation in 1988 pursuant to EPCRA, LEPCs have been operating at a local level, and have served as professional experts concerning hazardous materials planning, education, exercise, training, industry coordination, public education, and outreach. There are over 600 LEPCs in the country, of which 180-200 are active. The role of LEPCs in homeland security and drinking water is illustrated by the position taken by LEPCs in Florida. In a letter sent to Governor Jeb Bush, the Florida LEPCs have expressed great interest in homeland security offering their county, regional, and private industry hazardous materials plans and skills as a base for incorporating domestic security issues involving hazardous materials. The LEPCs conduct first-responder training and regional full-scale hazardous materials exercises. They also serve to educate the public on hazardous materials issues specific to their region and provide industry with the technical assistance needed to meet the requirements of EPCRA, including planning for mitigation and safety practices at facilities storing hazardous materials. LEPCs also have an established rapport with industry, emergency managers and emergency responders in their regions.[34] To the extent that the challenges of funding and training of LEPCs can be met, LEPCs provide a tremendous linkage with multiple entities at local, regional, and state levels.

Another key opportunity is provided by the membership of SERCs and LEPCs. As defined by statute, participation extends to emergency management, public health, fire fighters, law enforcement, environmental protection, planning, industry, environmental, media, and the public. These entities conduct regular meetings and often undertake training and exercises that involve the public. The diverse representation from multiple sectors and areas of expertise provide the opportunity for cross-connections between essential components of drinking water security.

In addition to Florida, examples of other states with strong emergency planning and management programs include Delaware and New Jersey, which should also be a good source of information. Generally, since the western states do not have many chemical facilities, they do not have as active SERCs, LEPCs, and other emergency management programs as do other areas. Houston is an example of a city with a good emergency management program.

First Responder Alliances

In addition to systemic emergency management linkages, there are also community-specific opportunities for collaboration with first responders, such as local police. This collaboration can address both prevention and response. Currently, some small towns have established a process to protect natural gas lines that could be expanded to protect drinking water distribution lines. The U.S. Department of Transportation has developed a plan to protect natural gas distribution systems from acts of terrorism, by establishing color codes for the vulnerable points within the city and linking these points to police protection. The local police routinely survey the various vulnerable points, and expedite surveillance during a period of heightened alert. It would be useful to link the color coding and routing for natural gas distribution to include vulnerable drinking water positions. Regarding response, communication of incidents beyond the local level must be improved. Drinking water utilities generally have a good relationship with local law enforcement, but a need remains for conveying the information beyond the local level to state drinking water personnel. Training for law enforcement, including criminal investigations and public health needs, is necessary. A major catalyst for the Florida DEP's emergency notification rule, discussed pre-

viously, was continuous incidents in which representatives of public water systems had not cooperated nor exercised an appropriate standard of care and concern for the public health of their customers.[35]

Community Disaster Teams

Within the emergency management structure, local and neighborhood groups receive special training to enhance their ability to recognize, respond to, and recover from a major emergency or disaster situation. Operated in conjunction with FEMA, these groups are called Community Emergency Response Teams. In addition, community members serve to help family and communities be safer, stronger, and better prepared to respond to any kind of disaster through personal responsibility, training, and volunteer service. These people are part of a state Citizen Corps. Together, these groups of dedicated people provide an audience to training on drinking water security.

Based on this assessment of opportunities for constructive interaction between diverse agencies, institutions and stakeholders involved in drinking water security, recommendations for follow-up action have been developed. These recommendations are presented in Table 3 according to type of action, audience, and vehicle for delivery.

Ultimately, opportunities to strengthen protection of our nation's drinking water for security and conventional purposes arise from constructive interaction between government, water utilities, emergency personnel, academic institutions, health, technical and legal sectors, non-governmental organizations, and the general public. These opportunities can address water infrastructure, public engagement, public health, technological advances, and emergency preparedness. By integrating homeland security authorities and actions at the federal and state level with environmental laws administered by the U.S. EPA as a foundation, constructive interaction can protect the nation's drinking water and communities from both terrorist and conventional threats in an effective and efficient manner.

FIGURE 3: RECOMMENDATIONS FOR FOLLOW-UP ACTION

		Audience									Vehicles							
		State and Local Governments[1]	Technical Sector[2]	Non-Governmental Organizations[3]	Academic Institutions	**Public** Health Sector[4]	Legal Sector	General Public	Emergency Personnel[5]	Drinking Water Utilities/ Public Water Suppliers	Videos	Media Announcements[6]	CD-Roms	Informational Print Materials[7]	Stakeholder Dialogues/ Roundtables	Research[8]	Curriculum Development/ Educational Programs	Mentoring Programs
Legal Research/ Analysis	Accessing Environmental Laws	X	X	X										X		X	X	
	Strengthening Public Health Laws	X			X	X										X	X	
	Engaging Bar Associations						X									X	X	
	Expanding Prevention Authorities	X	X	X											X	X		
Public and Stakeholder Education	Collaborating with Utilities on Risk Characerization and Dual-Purpose Functions		X	X						X	X			X	X	X		
	Conducting Public Outreach on Security Risks and Dual-Purpose Functions							X				X						
	Conducting Stakeholder Outreach on Security Risks and Dual-Purpose Functions			X							X		X	X	X	X		
	Increasing Awareness of Improved Technologies	X	X	X	X			X		X				X	X	X		
Synergy Between Interests	Engaging Emergency Preparedness Sector	X							X	X	X		X	X				
	Engaging Public Health Sector	X			X	X									X	X	X	
	Engaging Remediation Response Sector		X							X				X	X	X		
	Engaging Natural Disaster Preparedness Sector		X						X	X				X	X			
	Engaging Food Safety Sector	X		X						X				X	X	X		
Site Specific Projects	Mentoring between Small and Large Drinking Water Utilities	X	X	X						X				X	X			X
	Implementing Dual-Purpose Measures	X		X						X				X	X	X		X
	Engaging the Public in Dual-Purpose Drinking Water Safety and Security	X		X				X		X	X	X		X	X			
	Integrating Water Security and Public Health	X				X				X				X	X		X	

[1] Public Health Departments, Environmental Agencies
[2] Trade Associations, Technical Experts, Consultants
[3] Environmental Organizations, Faith-Based Organizations, Smart-Growth Organizations, Environmental Justice Organizations
[4] Health Care Providers, Associations
[5] First Responders, Emergency Management Personnel, State and Local Emergency Response Commissions
[6] Public Service Announcements, Press Releases
[7] Fact Sheets, Brochures, Citizen Guides
[8] Research, Analysis, Document Production

ENDNOTES

[1] Office of Homeland Security, *State and Local Actions for Homeland Security* (July, 2002).

[2] Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities, *The Model State Emergency Health Powers Act State Legislative Activity*, (August 13, 2003)(available at http://www.publichealthlaw.net/MSEHPA/MSEHPA_ legis_Activity.pdf, last visited Oct. 9, 2003).

[3] Due to the sensitive nature of material included in this section, references to specific documents are not always provided.

[4] Hoover, J.E. *Water Supply Facilities and National Defense*, Jour. AWWA, 33:11:1861 (1941).

[5] Texas A&M University System, Texas Engineering Extension Service, and the National Emergency Response and Rescue Training Center, *Acts of Terrorism/Weapons of Mass Destruction (WMD) Preparedness and Response for Water and Wastewater Executives* (2002).

[6] *Id.*

[7] *Id.*

[8] National League of Cities, *Domestic Terrorism: Resources for Local Governments*, (2000) (available at http://www.nlc.org/nlc_org/site/files/reports/terrorism.pdf, last visited Oct. 8, 2003).

[9] Berger, B. and A. Stevenson, *Feasibility of Biological Warfare Against Public Water Supplies,* Jour:AWWA, 47:2:101 (1955).

[10] DeNileon, Gay Porter, *Critical Infrastructure Protection: the Who, What, Why and How of Counterterrorism Issues* (available at http://www.mrws.org/Terror/Counterterrorism.htm, last visited Oct. 6, 2003).

[11] President's Commision on Critical Infrastructure Protection. Oct. 13, 1997. "Critical Foundations: Protecting America's Infrastructure."

[12] Burrows, W. and S. Renner, *Biological Warfare Agents as Threats to Potable Water,* Environmental Health Perspectives 107(12): 975-83 (1999).

[13] DeLeon, R. and M. Stewart, *Evaluation of Vulnerability to Microbial Threats.* Proceedings: American Water Works Association Water Quality Techology Conference, Salt Lake City (2000).

[14] Spears, Tom, Pumps *Most Vulnerable Part of the Water System*, The Ottawa Citizen (Oct. 21, 2001).

[15] Moyer, N.P., *Infectious Risks from Public Drinking Water or The Bioterrorist's CCL*, Proceedings: American Water Works Association Water Quality Technology Converence, Salt Lake City (2000).

[16] Sandia National Laboratories, *Sandia Develops Program to Assess Water Infrastructure Vulnerabilites*, (Oct. 3, 2001) (available at http://www.sandia.gov/media/NewsRel/ NR2001/watinfr:htm, last visited Oct. 8, 2003).

[17] Blaha, Frank, *Small System Security – There is Help and Hope*, American Water Works Association e- Journal Vol.95, No.7 (July 2003) (available at: http://www.awwa.org/communications/journal/2003/July/News/smallsystems0703.cfm, last visited Oct, 8, 2003).

[18] Dick, Ronald, Director National Infrastructure Protection Center, FBI, *Terrorism: Are America's Water Resources and Environment at Risk,* Congressional Statement for the Record Before the House Committee on Transportation and Infrastructure, Subcommittee on Water Resources and Environment (Oct. 10, 2001) (available at http://www.fbi.gov/congress/congress01/rondick101001.htm, last visited Oct. 8, 2003).

[19] Lancaster-Brooks, Richard, *Water Terrorism: An Overview of Water and Wastewater Security Problems and Solutions*, Journal of Homeland Security (February 2002) (available at http://www.homelandsecurity.org/journal/articles/displayArticle.asp?article=31, last visited Oct. 8, 2003).

[20] Information for this section was largely obtained from interviews conducted by Suzi Ruhl and Vivian Buckingham with the sources listed in Appendix A. The interviews took place from October 2002 to June 2003.

[21] Joseph A. Moore, Alderman, City of Chicago, and Chair, National League Of Cities' Energy, Environment and Natural Resources Committee, Congressional Testimony Before the House Energy and Commerce Committee (April 11, 2002).

[22] Texas A&M University System, Texas Engineering Extension Service, and the National Emergency Response and Rescue Training Center, *Acts of Terrorism/Weapons of Mass Destruction (WMD) Preparedness and Response for Water and Wastewater Executives* (2002).

[23] Presidential Decision Directive 63: Protecting America's Critical Infrastructures (1998); *See also*, DeNileon, Gay Porter, *Critical Infrastructure Protection: the Who, What, Why and How of Counterterrorism Issues* (available at http://www.mrws.org/Terror/Counterterrorism.htm, last visited Oct. 6, 2003).

[24] U.S. Environmental Protection Agency, Office of Water, *The Drinking Water State Revolving Fund Program, Financing America's Drinking Water from the Source to the Tap*, Report to Congress, EPA 918-R-03-009 (May 2003).

[25] American Water Works Association, *Water System Security: A Field Guide* (2002).

[26] Morrison J. and A. Wolf, *Environmental Water Security: Lessons from the Southwestern U.S., Northwestern Mexico, and the Middle East*, at U.S. Global Change Research Seminar (Nov. 23, 1998)(available at http://www.usgcrp.gov/usgcrp/seminars/98113FO.html, last visited Oct. 6, 2003).

27. Edge, V.L et al., Division of Enteric, Foodborne and Waterborne Diseases, Health Canada, Duelph, Ontario, *Development of an Alternative Surveillance Alert Program (ASAP): Syndromic Surveillance of Gastrointestinal Illness Using Pharmacy Over-the-Counter Sales* (2002) (available at http://www.nyam.org/events/syndromicconference/2002/posterpdf/ edge_poster.pdf, last visited Oct. 6, 2003).

[28] Meinhardt, Patricia L, *Physician Preparedness for Acts of Water Terrorism: Physician On-Line Readiness Guide for Acts of Water Terrorism* (available at http://www.waterhealthconnection.org/bt/Default.asp, last visited Oct. 6, 2003)

[29] National Research Council of the National Academies of Science, Committee on Science and Technology for Combating Terrorism, *Making the Nation Safer, the Role of Science and Technology in Counterterrorism* (2002) (available at http://www.nap.edu/books/ 0309084814/html/, last visited Oct. 6, 2003).

[30] Abbaszadegan, M. et al., *Detection of* Enteroviruses *in Groundwater Using the Polymerase Chain Reaction*, Appl. Environ. Microbial 59:1318-1324 (1993).

[31] Huffman, D.E. and J.B. Rose, *Emerging Waterborne Pathogens*, Florida Water Resources Journal, 20-22 (September 2002).

[32] *Id.* at 20.

[33] Clark, R. and R. Deininger, *Minimizing the Vulnerability of Water Supplies to Natural and Terrorist Threats*, Proceedings, IMTECH-AWWA Conference, Atlanta Georgia (April 8-11, 2001).

[34] Letter from W. Craig Fugate, Alternate Chariman State Emergency Response Commission for Hazardous Materials to Governor Jeb Bush, State of Florida (November 15, 2002).

[35] Letter from Allan F. Bedwell, Deputy Secretary, Regulatory Programs, to Plant Owners and Operators (January 23, 2003).

APPENDIX A
LIST OF INTERVIEWEES

ELI conducted interviews with representatives from 11 different sectors and subject-matter areas, and multiple interviews within these areas. These interviews formed the basis of information presented in Chapter 6, Promoting Opportunities for Constructive Interaction.

Faith-based Advocate

Reverend Adora Lee
United Church of Christ
110 Maryland Ave, N.E.
Washington, DC
(202)543-1517
(202)543-5994 (fax)
adoracrj@aol.com

Grassroots Advocate

Victor De Luca
President Jessie Smith Noyes Foundation
6 East 39th Street, 12th Floor
NY, NY10016-0112
(212)684-6577
(212)689-6549 (fax)
vic@igc.org

International

Japanese visitors

Ikumi Nakayama and Kayo Sugai
Office IRIS, Tokyo 1615 Kenyon St. NW, Apt. #36
Washington D.C. 20010
(202)234-7874
kayoyon@hotmail.com

Israeli visitors

Gilad Heimann
Spokesperson
Israel Union for Environmental Defense
85 Nachalat Binyamin Street
Tel-Aviv 66102
Israel
03-5669939
03-5669940 (fax)
gilad@iued.org.il

Shimon Tsuk
Scientific Department
Israel Union for Environmental Defense
85 Nachalat Binyamin Street
Tel-Aviv 66102
Israel
03-5669939
03-5669940 (fax)
stsuk@iued.org.il

Alona Karo-Yeffet
Legal Department
Israel Union for Environmental Defense
85 Nachalat Binyamin Street
Tel-Aviv 66102
Israel
03-5669939
03-5669940 (fax)
alona@iued.org.il

Ehud Leschem
Head, Environmental Department
Ministry of Health, Central District
91 Hertzel
Ramle 72430, Israel
972-8-9788708
adileshm@netvision.net.il

Local Government

Norman Ellis
Water, Sewer, and Gas Foreman
City of Chattahoochee
P.O. Box 188
Chattahoochee, FL 32324
(850)663-4475

Roderick McMillon
Wastewater Treatment Plant Operator
City of Chattahoochee
Chattahoochee, FL 32324
(850)663-4475

Eugene Miller
Interim City Manager
City of Orange City
205 East Graves Avenue
Orange City, FL 32763
(386)775-5409
(386)775-5416 (fax)
citymanager@ci.orange-city.fl.us

Local Health Department

D. Michael Flannery, P.E.
Director, Environmental Engineering Division
Pinellas County Health Department
Florida Department of Health
4175 E. Bay Drive, Suite 300
Clearwater, FL 33764
(727)538-7277 Ext 105
(727)538-7293 (fax)
mike_flanner@doh.state.fl.us

Public Health

H. Michael Maetz, V.M.D., M.P.H.
Professor of Epidemiology/
School of Public Health
Associate Director, Public Health Component/Center for Emergency Care and Disaster Preparedness
University of Alabama at Birmingham
1530 3rd Avenue South, RPHB 230
Birmingham, AL 35294-0022
(205)934-7074
(205)934-8665(fax)
hmm@uab.edu

Robert Brooks, M.D.
Associate Dean for Health Affairs
College of Medicine
Florida State University
Tallahassee, FL 32306-4300
(850)644-3845
(850)644-9399 (fax)
robert.brooks@med.fsu.edu

State Community Affairs Agency

Eve Rainey
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850)488-8466
(850)921-0781(fax)
eve.rainy@dca.state.fl.us

State Health Department

Bart Bibler, P.E., Chief
Bureau of Water Programs
Florida Department of Health
4052 Bald Cypress Way, Bin #C-22 Tallahassee, FL 32399-1742
(850) 245-4240
Bart_Bibler@doh.state.fl.us

Pepe Menendez
Bureau of Water Programs
Florida Department of Health
4052 Bald Cypress Way
Tallahassee, FL
(850)245-4444
Pepe_Menendez@doh.state.fl.us

Jack Pitman
Former Director, Office of Public Health Preparedness
Florida Department of Health
Director, Public Health Preparedness
Leon County Health Department
P.O. Box 2745
Tallahassee, FL 32316
(850)487-3146
(850)487-7954
Jack_Pittman@doh.state.fl.us

State Environmental Agency

Philip P. Wieczynski, P.E.
Bureau Chief
Bureau of Emergency Response
Division of Law Enforcement
Florida Department of Environmental Protection
3900 Commonwealth Blvd
Tallahassee, FL 32399-3000
(850)245-2875
(850)245-2882 (fax)
Phil.Wieczynski@dep.state.fl.us

Van Hoofnagle, P.E.
Administrator
Drinking Water Program
Bureau of Water Facilities Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(850)245-8631
(850)245-8699 (fax)
Van.Hoofnagle@dep.state.fl.us

Michael Leroy, P.E.
Drinking Water Program
Bureau of Water Facilities Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(850)245-8632
(850)245-8699 (fax)
mike.leroy@dep.state.us

Greg Lee
Environmental Adminisrator
Bureau of Emergency Response
Division of Law Enforcement
Florida Department of Environmental Protection
3900 Commonwealth Blvd
Tallahassee, FL 32399-3000
(850)245-2875
(850)245-2882(fax)
Greg.Lee@dep.state.fl.us

Utility

Mitch Basefsky
Public Information Officer
Tucson Water
P.O. Box 27210
Tucson, Arizona 85726-7210
(520)791-4331
mbasefs1@ci.tucson.az.us

Kevin McGlynn
McGlynn Consulting Co.
2906 Abbotsford Way
Tallahassee, FL 32312
(850)297-0099
(850)297-0561 (fax)
mcglynnconsco.com

Water Advocate

Dick Mark
The Buttonwood Partnership Consultant
Beldon Fund's Key States Program
1050 S. Yachtsman Drive
Sanibel, FL 33957
239-472-9179
239-472-5685 (fax)
rfmisland@earthlink.net

APPENDIX B
SELECTED STATE LEGISLATION

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
Arizona	Public Health Measures	HB 2044 (2002)	Board of dental examiners; fees (NOW: enhanced surveillance advisory; bioterrorism)	Amends Ariz. Rev. Stat. §§ 36-136, 624, 781-790	
California	Appropriations	AB 93 (2003), AB 107 (2003), AB 1110 (2003), SB 21(2003), SB 750 (2003)	Various bills relating to the financing of safe drinking water/ water security initiatives		None of these bills have yet been passed.
California	Public Health Measures	AB 206 (2003)	Emergency Health Powers Act		This bill has not yet been passed; it was referred to the Committee on Appropriations on 4/29/03.
California	Administrative Actions	SB 27 (2002)	An act relating to emergency services		This bill would create the Office of Emergency Services within the Office of the Governor; the bill has not yet been passed.
Colorado	Emergency Preparedness	Colo. Rev. Stat. § 24-33.5-1601	Office of Preparedness, Security, and Fire Safety		The Office is established to coordinate Colorado's response to the threat of terrorism.
Connecticut	Crimes and Law Enforcement	HB 5759 (2002)/ Public Act 02-97	An Act Concerning Acts of Terrorism	Creates new sections of Colo. Rev. Stat. and amends Colo. Rev. Stat. §§ 42-230, 53a-62, 53a-165, 53a-166, 53a-167, 54-41b, 54-47b	
Connecticut	Water Supply Protection	HB 5153 (2002)/ Public Act 02-102	An Act Concerning Water Supply Plans and Water Diversions	Amends Conn. Gen Stat. §§ 19a-36, 19a-37, 19a-209a, 25-32d; repeals and substitutes Conn. Public Act 01-102	
Connecticut	Appropriations	HB 5303 (2002)	An Act Protecting the Citizens of this State from Terrorism or other Mass Casualty Incidents		This bill has not yet been passed; it was referred to the Joint Committee on Public Safety on 2/14/02.
Connecticut	Public Health Measures	Public Act No. 03-236	An Act Concerning Public Health Emergency Preparedness Authority	Amends Conn. Gen. Stat. § 19a-221	
Delaware	Public Health Measures	HS 1 to HB 377 (2002)	Delaware Emergency Health Powers Act	Amends various sections of Title 16 and Title 20 of the Delaware Code	

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
District of Columbia	Crimes and Law Enforcement	B14-0373 (2002)	Omnibus Anti-Terrorism Act of 2002	Amends D.C. Code §§ 22-1393, -2106, -4501, 23-113, -1331, 24-901; adds §§ 22-3152 through 3156	This bill also amends additional sections of the DC Code and addresses aspects of terrorism that fall outside the scope of these categories.
District of Columbia	Public Health Measures	B14-0373 (2002)	Omnibus Anti-Terrorism Act of 2002	Amends D.C. Code § 7-132 through -138, -140, -2301, -2304, -2304.01, -2306; repeals § 7-142	
District of Columbia	Emergency Preparedness	B14-0373 (2002)	Omnibus Anti-Terrorism Act of 2002	Amends D.C. Code §§ 7-2301 through -2304; adds § 7-2331 and -2332	
District of Columbia	Administrative Actions	B14-0373 (2002)	Omnibus Anti-Terrorism Act of 2002	Amends D.C. Code § 2-534	
Florida	Crimes and Law Enforcement	S 0024 C (2001)	Relating to Domestic Security/Counter-Terrorism	Amends Fla. Stat. Ann. § 943; creates § 775.30	
Florida	Administrative Actions	S 0026 C (2001)	Relating to Domestic Security/Counter-Terrorism	Amends Fla. Stat. Ann. § 943.0321; creates § 775.30	
Florida	Crimes and Law Enforcement	S 0010 C (2001)	Relating to Poisoning	Amends Fla. Stat. Ann. §§ 859.01, 921.0022	
Florida	Administrative Actions	S 0016 C (2001)	Relating to Public Records/Security-System Plan	Adds Fla. Stat. Ann. §§ 119.071, 286.0113	
Florida	Public Health Measures	SB 1262 (2002)	Public Health Emergency	Amends Fla. Stat. Ann. §§ 381.0011, 381.00315, 768.13	
Georgia	Public Health Measures	SB 385 (2002)	Public Health Emergencies; bioterrorism; reportable illnesses; health conditions or unusual or suspicious events; requirements	Amends Ga. Code Ann. § 31-12-1.1	
Hawaii	Public Health Measures	HB 2521 (2002)	A Bill for an Act Relating to Control of Disease	Amends Haw. Rev. Stat. §§ 321-1, 321-311.5, 325, 325-8; repeals §§ 325-79 to 325-84	
Idaho	Crimes and Law Enforcement	SB 1348 (2002)	Terrorism/Terms Defined/Penalties	Adds Idaho Code §§ 18-8106, 18-3322 through -3324; amends Idaho Code §§ 18-4003, -7803, -8102, -8103, 19-402	
Idaho	Public Health Measures	SB 1075 (2003)	An Act Relating to Powers and Duties of the Director of the Department of Health and Welfare to Protect the Public Health	Amends Idaho Code §§ 56-1001, 56-1003	

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
Illinois	Public Health Measures	Public Act 93-0249	An act concerning public health emergencies	Amends 15 ILCS 30/1, 20 ILCS 3305/4, 20 ILCS 3305/5, 20 ILCS 3305/9; Adds 20 ILCS 2310/2310-50.5	
Iowa	Public Health Measures	H.F. 396	Disaster Preparedness	Adds Iowa Code § 135.150 to 135.155	
Kansas	Emergency Preparedness	SB 541 (2002)	Division of Emergency Management, Terrorism Preparedness Programs and Emergency Medical Response Teams	Amends Kan. Stat. Ann. §§ 44-510h, 44-577, 48-915 and 48-928 Kan. Stat. Ann. 2001 Supp. §§ 44-511, 48-904, 65-5722 and 75-6102; repeals Kan. Stat. Ann. 2001 Supp. § 75-6102a.	
Kansas	Emergency Preparedness	SB 629 (2002)	Adjutant General and the Division of Emergency Management	Amends Kan Stat. Ann. § 48-928 and Kan. Stat. Ann. 2001 Supp. 48-904	
Louisiana	Public Health Measures	Act. No. 1206 (2003)	Louisiana Health Emergency Powers Act	Adds La. Stat. Ann. §§ 29:760 to 29:772, 44:4(36), 4.1(B)(15.1)	
Maine	Public Health Measures	LD 2164 (2002)	An Act to Provide Government with the Necessary Authority to Respond to a Public Health Emergency Caused by an Act of Bioterrorism	Amends Me. Rev. Stat. Ann. Tit 22 §§ 802, 812, 813	
Maryland	Water Supply Protection	HB 0350 (2002)	Drinking Water Security Act	Amends Md. Code Ann. Envir. §§ 9-406(c), 407	
Maryland	Administrative Actions	SB 0242 (2002)	Maryland Security Council	Amends Md. Code Ann. State Gov't. §§ 9-2501 to 2509	
Maryland	Public Health Measures	SB 0234 (2002)	Catastrophic Health Emergencies-Powers of the Governor and the Secretary of Health and Mental Hygiene	Amends Md. Ann. Code art. 41 §§ 2-201 to 204, Md. Code Ann. Health-Gen § 18-901 to 908	
Maryland	Emergency Preparedness	SB 0239 (2002)	Maryland Emergency Management Assistance Compact	Adds Md. Ann. Code art. 16A §§ 37-39	
Maryland	Administrative Actions	SB 0240 (2002)	State Government- Access to Public Records, Public Security Documents	Amends Md. Code Ann. State Gov't. §§ 10-618(a), (j), 10-622, and 10-623	
Maryland	Crimes and Law Enforcement	HB 0303 (2002)	Governor's Emergency Powers	Amends Md. Ann. Code art. 16A §§ 3(d), 12	This bill also amends additional sections of the Maryland state statutes.
Maryland	Public Health Measures	HB 0303 (2002)	Governor's Emergency Powers	Amends Md. Code Ann. Health § 18-102	
Maryland	Emergency Preparedness	HB 0303 (2002)	Governor's Emergency Powers	Amends Md. Ann. Code art. 16A § 6(a) and (b)	

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
Massachusetts	Administrative Actions	SB 2173 (2001)	An Act Protecting the Public Health of the Commonwealth from Bio-terrorism, Other Forms of Terrorism and Activities Related to Terrorism		This bill has not yet been passed; it was referred to the Senate Ways and Means Committee on 11/26/01.
Michigan	Administrative Actions	HB 5349 (2001)/ Public Act 130 (2002)	An Act to Provide for Public Access to Certain Public Records of Public Bodies	Amends Mich. Comp. Laws 15.243 § 13	
Minnesota	Public Health Measures	HF 3031 (2002)	Minnesota Emergency Health Powers Act	Amends Minn. Stat. §§ 12.03, 12.21, 12.31, 12.32, 12.34, 13.3806; adds Minn. Stat. §§ 12.311, 12.312, 12.381, 12.39, 144.419, 144.4195	
Missouri	Crimes and Law Enforcement	SB 712 (2002)	Modifies Provisions Relating to Terrorism	Amends Mo. Rev. Stat. § 569.072 (1), (2)	
Missouri	Administrative Actions	SB 712 (2002)	Modifies Provisions Relating to Terrorism	Adds Mo. Rev. Stat. § 38.50 (1)-(8)	
Montana	Public Health Measures	HB 499 (2003)	An Act Revising Emergency Health Powers and Communicable Disease Laws to Ensure the Ability to Adequately Respond to Incidents and Disasters Involving Bioterorrism and Weapons of Mass Destruction	Amends Mont. Code Ann. §§ 10-3-103, 45-5-623, 50-1-101, 50-1-202, 50-1-204, 50-2-101, 50-2-116, 50-2-118, 50-2-130, AND 50-16-603	
Nevada	Public Health Measures	SB 82 (2003)	An Act Relating to Public Health	Amends Nev. Rev. Stat § 439.360, 439.470; 441A.010, 441A.120, 441A.160, 3.223; Adds new sections to Nev. Rev. Stat. § 441A	
New Hampshire	Appropriations	HB 1478 (2002)	An Act Relative to Public Health Emergency Preparation and Response	Amends N.H. Rev. Stat. Ann. § 125F:8, adds N.H. Rev. Stat. Ann. § 125-F:8-b	
New Hampshire	Administrative Actions	HB 1423 (2002)	Relative to State or Local Government Security Issues Under the Right-to-Know Law and Relative to Threats of Biological or Chemical Substance	Amends N.H. Rev. Stat. Ann. § 91-A:3 and A:5; adds N.H. Rev. Stat. Ann. § 91-A:5-a	
New Hampshire	Water Supply Protection	SB 0437 (2002)	An Act Relative to the Protection of Public Water Supplies	Amends N.H. Rev. Stat. Ann. §§ 362.4, 485.4, 485:23, 485:24; adds N.H. Rev. Stat. Ann. § 378:30-d, establishes a committee under N.H. Rev. Stat. Ann. § 486-A	

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
New Hampshire	Public Health Measures	HB 1478 (2002)	An Act Relative to Public Health Emergency Preparation and Response	Amends N.H. Rev. Stat. Ann. § 107-C:5, adds N.H. Rev. Stat. Ann. §§ 21-P:49 through 51, 107-C:17 through 19, 141-C:2, C:7, C:8, 10 through 16; repeals N.H. Rev. Stat. Ann. §§ 21-P:49 and 50, 107-C:17 and 18	
New Hampshire	Crimes and Law Enforcement	HB 1423 (2002)	Relative to State or Local Government Security Issues Under the Right-to-Know Law and Relative to Threats of Biological or Chemical Substance	Amends N.H. Rev. Stat. Ann. §§ 106-H:13, 631:4, 644:3, 644	
New Jersey	Crimes and Law Enforcement	N.J. Stat. Ann. § 2C:38-3	Producing or Possessing Chemical Weapons, Biological Agents or Nuclear or Radiological Devices		Included in the definition of a "biological agent" is anything capable of deteriorating food and
New Jersey	Appropriations	S 2575 (2001)/ Public Law 2001 Chapter 246	Domestic Security Preparedness Act		The bill appropriates a total of $8,950,000.
New Jersey	Administrative Actions	S 2575 (2001)/ Public Law 2001 Chapter 246	Domestic Security Preparedness Act		Establishes the Domestic Security Preparedness Task Force and the Domestic Security Preparedness Planning Group.
New Jersey	Public Health Measures	A2206 (2002)	An act concerning domestic security preparedness		This bill would requires the Domestic Security Preparedness Planning Group to prepare a public health Emergency Preparedness plan. The bill has not yet been passed; it was referred to the Referred to Senate Health, Human Services and Senior Citizens Committee on 2/27/03.
New Mexico	Administrative Actions	SJM 62/ HJM 35 (2002)	State Emergency Preparedness		Establishes a work group to evaluate existing statutory provisions and regulatory requirements relating to the handling of an emergency.
New Mexico	Public Health Measures	HB 195 (2002)	Threatening Communicable Diseases	Amends N.M. Stat Ann. § 24-1-5	
New Mexico	Public Health Measures	HB 231 (2003)	Public Health Emergency Preparedness Act	Adds new sections to N.M. Stat. Ann. § 12-10	

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
New York	Public Health Measures	SB 4750 (2003)	An act and to amend the executive law, in relation to planning for and declaring a state of public health emergency; and to amend the public health law, in relation to enacting the state emergency health powers act		This bill would create a public health emergency planning commission, which would be required to create and distribute a public health emergency plan, among other measures. This bill has not yet been passed; it was referred to the committee on Veterans, Homeland Security and Military Affairs on 4/14/03. The State Assembly version of the bill (AB 6321) has not yet been passed; it was amended by the committee on Health on 6/4/03.
Ohio	Public Health Measures	SB 296 (2002)	A bill to modify the powers and duties of the Department of Health, Public Health Council, and boards of health relative to bioterrorism and other public health matters		This bill has been passed by the Senate but has not yet been introduced in the House.
Ohio	Public Health Measures	SB 6 (2003)	A bill to modify the powers and duties of the Department of Health, Public Health Council, and boards of health relative to bioterrorism and other public health matters		This bill has been passed by the Senate and has been referred to the House Committee on Homeland Security, Engineering and Architectural Design on 3/12/03.
Oklahoma	Crimes and Law Enforcement	Okla. Stat. Ann. tit. 21 §§ 1268.1, 1268.2	Biochemical Terrorism		Biochemical terrorism includes acts of terrorism intended to harm any water supply; any act of terrorism is a felony.
Oregon	Public Health Measures		A bill for an act relating to state of impending public health crisis; creating new provisions; amending ORS 433.019 and 433.035; and declaring an emergency		This bill has not yet been passed; it was referred to the Senate Committee on Human Resources on 5/20/03.

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
Pennsylvania	Public Health Measures	SB 1569 (2002)	Counterterrorism Planning, Preparedness and Response Act		The Act provides for counterterrorism planning, preparedness and response; imposes powers and duties on the Pennsylvania Emergency Management Agency, the Department of Health, counties and municipalities; and provides for the organization of various response teams.
Rhode Island	Public Health Measures	HB 4757 (2003)	An Act Relating to Military Affairs and Defense -- Emergency Health Powers Act	Amends R.I. Gen. Laws § 23-1-18, 23-8-4, 30-15-2, 30-15-3, 30-15-6, 30-15-9 and 30-15-15; and adds §23-8-4.1	
South Carolina	Administrative Actions	S.C. Code Ann. § 6-11-340	Establishment of Special Purpose Districts		A special purpose district is defined as a special purpose district charged with the operation and maintenance of … water treatment facilities, or with the operation and management of any water distribution system.
South Carolina	Crimes and Law Enforcement	S.C. Code Ann. § 6-11-340	Establishment of Special Purpose Districts		Each special purpose district is authorized to establish a public safety department to protect and police the facilities owned by the district.
South Carolina	Emergency Preparedness	HB 4416 (2002)	Omnibus Counter-Terrorism and Homeland Defense Act of 2002	Amends S.C. Code Ann. § 1-3-420	
South Dakota	Public Health/ Communicable Disease	HB 1304	An Act to Revise the Emergency Powers of the Department of Health	Amends S.D. Codified Laws Ann. §§34-3-26, adds new sections to S.D. Codified Laws Ann. §§ 34-22, 34-16; repeals S.D. Codified Laws Ann. §§ 34-22-1 through 16, 34-16-3, 4, 6 through 13, 34-22-3 and 4	
Tennessee	Public Health Measures	SB 2392 (2002)/ Public Chapter 767	Tennessee Emergency Health Powers Act	Adds Tenn. Code Ann. §§ 6-56-101 through 109	

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
Texas	Crimes and Law Enforcement	Tex. Penal Code § 22.07	Terroristic Threat		Offenses include those with intent to "cause impairment or interruption of public communications, public transportation, public water, gas, or power supply or other public service."
Texas	Public Health Measures	HB 2988 (2003); SB 355 (2003)	An Act relating to public health preparedness; providing criminal penalties		These bills have not yet been passed; HB 2988 has been passed by the House, and SB 355 has been passed by the Senate, but neither has passed the other house.
Utah	Public Health Measures	HB 231 (2002)	Public Health Authority Amendments	Amends Utah Code Ann. § 63-55-226, Adds Utah Code Ann. §§ 26-23b-101 through 109	
Utah	Public Health Measures	SB 160 (2003)	Emergency Health Response Amendments	Amends Utah Code Ann. § 26A-1-114, 58-1-307, 58-13-2, 58-17a-620, 63-30-3, 78-11-22	
Vermont	Crimes and Law Enforcement	SB 298 (2002)/ Act 137	Crimes and Procedures Involving Terrorism	Adds Vt. Stat. Ann. Tit. 13 § 76-3501 through 3504	
Virginia	Public Health Measures	HB 882 (2002)	Requires the creation of a Bioterrorism Unit within the Department of Health to prevent, manage, and respond to any critical event or emergency resulting from bioterrorism		This bill has not yet been passed; it was continued to 2003 in Appropriations.
Washington	Emergency Preparedness	SB 2854	Coordinating Planning and Reporting with Regard to a Bioterrorism Incident		This bill has not yet been passed; it was returned to the House Rules Committee for a third reading on 3/14/02.
Wisconsin	Public Health Measures	SB 120 (2003)	An act relating to: creating a public health council, reimbursement for quarantine costs, intrastate mutual aid, requiring use of the incident command system in an emergency, exemption from liability during a state of emergency, threats to release or disseminate harmful chemical, biological, or radioactive substances, making appropriations, and providing a penalty.		This bill has not yet been passed; it was referred to committee on Homeland Security, Veterans and Military Affairs and Government Reform on 4/16/03.

State	Law Type	Bill/Act/ Statute #	Title/Description	Notes	Notes 2*
Wyoming	Public Health Measures	SF 67 (2002)	An act relating to public health and safety; providing protections against terrorism and bioterrorism; modifying the Wyoming Emergency Management Act, providing public health protections against communicable diseases and protections against agricultural bioterrorism; providing for the coordination of anti-terrorism efforts...		This bill has not yet been passed; it was referred to the House Committee on Minerals, Business and on 3/1/2003.

* Unless otherwise noted in the "Notes2" column, all bills have been adopted into law.

APPENDIX C
STATE WEB SITES

State	Homeland Security Website	Drinking Water Protection Website
Alabama	www.homelandsecurity.alabama.gov/	www.adem.state.al.us/WaterDivision/Drinking/DWMainInfo.htm
Alaska	www.state.ak.us/local/pr101701.html	www.state.ak.us/local/akpages/ENV.CONSERV/deh/water/drinking.htm
Arizona	www.dem.state.az.us/terrorismpreparedness.htm	www.water.az.gov/adwr/
Arkansas	www.adem.state.ar.us	www.adeq.state.ar.us/water/
California	www.oes.ca.gov/	www.water.ca.gov/
Colorado	www.ops.state.co.us/	www.cdphe.state.co.us/wq/Drinking_Water/Drinking_Water_Program_Home.htm
Connecticut	www.ct.gov/hls/	dep.state.ct.us/wtr/index.htm
Delaware	www.state.de.us/dema	www.dnrec.state.de.us/water2000/Sections/WatSupp/DWRWatSupp.htm
Florida	www.fdle.state.fl.us/domestic_security	www.dep.state.fl.us/water/drinkingwater/index.htm
Georgia	www.gahomelandsecurity.com	
Hawaii	www.scd.state.hi.us/	www.state.hi.us/doh/eh/sdwb/
Idaho	www.accessidaho.org/health_safety/homeland_security.html	www.deq.state.id.us/water/water1.htm#drinking_water
Illinois	www100.state.il.us/security/	
Indiana	www.IN.gov/c-tasc	www.in.gov/idem/water/dwb/
Iowa	www.iowahomelandsecurity.org/	www.state.ia.us/epd/wtrq/wtrqbur.htm
Kansas	www.accesskansas.org/kdem/	www.kdhe.state.ks.us/water/
Kentucky	homeland.state.ky.us	water.nr.state.ky.us/dw/default.htm
Louisiana	www.loep.state.la.us/homeland/default.htm	
Maine	www.maine.gov/portal/homelandsec.html	www.state.me.us/dhs/eng/water/
Maryland	www.mema.domestic-preparedness.net/main.html	www.mde.state.md.us/Programs/WaterPrograms/Water_Supply/index.asp
Massachusetts	mass.gov/portal/index.jsp?pageID=agca&agid=ocs&agca=main	www.state.ma.us/dep/brp/dws/dwshome.htm
Michigan	www.michigan.gov/msp/1,1607,7-123-1593_3507_8920---,00.html	www.michigan.gov/deq/0,1607,7-135-3313_3675-11150--,00.html
Minnesota	www.dps.state.mn.us	www.health.state.mn.us/divs/eh/water/
Mississippi	www.homelandsecurity.ms.gov/	www.msdh.state.ms.us/msdhsite/index.cfm/11,0,76,61,html
Missouri	www.homelandsecurity.state.mo.us	www.dnr.state.mo.us/wpscd/pdwp/homepdwp.htm
Montana	www.discoveringmontana.com/homelandsecurity/css/default.asp	www.deq.state.mt.us/wqinfo/Index.asp
Nebraska	www.state.ne.us/homeland/	www.hhs.state.ne.us/enh/pwsindex.htm
Nevada	homelandsecurity.nv.gov/	ndep.nv.gov/bwqp/bwqp01.htm
New Hampshire	www.nhoem.state.nh.us	www.des.state.nh.us/water_intro.htm
New Jersey	www.NJCounterTerrorism.com	www.state.nj.us/dep/watersupply/safedrnk.htm
New Mexico	www.dps.nm.org	www.nmenv.state.nm.us/dwb/dwbtop.html
New York	www.state.ny.us/security/index.html	www.dec.state.ny.us/website/dow/index.html
North Carolina	www.ncgov.com/asp/subpages/safety_security.asp	www.ncwater.org/
North Dakota	www.state.nd.us/dem/HomeSec.html	www.health.state.nd.us/ndhd/environ/mf/
Ohio	www.state.oh.us/odps/sos/ohshome.htm	www.dnr.state.oh.us/water/
Oklahoma	www.youroklahoma.com/homelandsecurity/	www.deq.state.ok.us/WQDnew/wqprogrms.html
Oregon	www.osp.state.or.us/opss/	www.ohd.hr.state.or.us/dwp/index.cfm
Pennsylvania	www.homelandsecurity.state.pa.us	www.dep.state.pa.us/dep/deputate/watermgt/wsm/WSM.HTM
Rhode Island	www.state.ri.us/riema	www.state.ri.us/dem/programs/benviron/water/index.htm
South Carolina	www.state.sc.us/emd/	www.scdhec.net/water/
South Dakota	www.state.sd.us/homeland/	www.state.sd.us/denr/des/drinking/dwprg.htm
Tennessee	www.state.tn.us/homelandsecurity/	www.state.tn.us/environment/dws/index.html
Texas	www.texashomelandsecurity.com/	www.tnrcc.state.tx.us/subject_water.html
Utah	des.utah.gov	www.water.utah.gov/
Vermont	www.dps.state.vt.us/homeland/	www.vermontdrinkingwater.org/
Virginia	www.commonwealthpreparedness.state.va.us/	www.deq.state.va.us/water/
Washington	access.wa.gov/emergency/homeland.asp	www.doh.wa.gov/ehp/dw/default.htm
West Virginia	www.state.wv.us/wvoes/	www.dep.state.wv.us/item.cfm?ssid=11
Wisconsin	www.wisconsin.gov/state/core/domestic_prep.html	www.dnr.state.wi.us/org/water/dwg/
Wyoming	attorneygeneral.state.wy.us/ctc.htm	deq.state.wy.us/wqd/index.asp?pageid=5

THE ENVIRONMENTAL LAW INSTITUTE

For the past three decades, the Environmental Law Institute has played a pivotal role in shaping the fields of environmental law, management, and policy domestically and abroad. Today, ELI is an internationally recognized, independent research and education center.

Through its information services, training courses and seminars, research programs, and policy recommendations, the Institute activates a broad constituency of environmental professionals in government, industry, the private bar, public interest groups, and academia. Central to ELI's mission is convening this diverse constituency to work cooperatively in developing effective solutions to pressing environmental problems.

The Institute is governed by a board of directors who represent a balanced mix of leaders within the environmental profession. Support for the Institute comes from individuals, foundations, goverment, corporations, law firms, and othehr sources.

ENVIRONMENTAL
LAW • INSTITUTE®

1616 P Street, N.W., Suite 200
Washington, D.C. 20036
Telephone: (202) 939-3800
Fax: (202) 939-3868
E-mail: law@eli.org ● Web site: www.eli.org