United States Environmental Protection Agency

EPA Water Security & Resiliency Highlights

Program Overview

Safe drinking water and properly treated wastewater are critical to human health, the environment, and the economy. Homeland Security Presidential Directive 7 (HSPD-7) designates the U.S. Environmental Protection Agency (EPA) as the Sector-Specific Agency responsible for identifying, prioritizing and coordinating the protection of the nation's drinking water and water treatment systems. EPA works with tribes, states, drinking water and wastewater utilities, communities, and other partners to enhance the security and resiliency of water and wastewater infrastructure. Protecting this critical infrastructure is key to maintaining not only the public health and environmental benefits of safe and clean drinking water, but also to maintaining the services of the other 17 critical infrastructure sectors, which share interdependencies with the Water Sector.

EPA's mission is to provide national leadership in developing and promoting security and resiliency programs that enhance the Water Sector's ability to prevent, detect, respond to, and recover from all hazards.

The Water Sector's Security Vision is a secure and resilient drinking water and wastewater infrastructure that provides clean and safe water as an integral part of daily life, ensuring the economic vitality of and public confidence in the nation's drinking water and wastewater through a layered defense of effective security and resiliency practices in the sector. EPA, in partnership with drinking water and wastewater utilities and their associations, has developed four goals that will drive development of EPA's security and resiliency program. These goals are:

Goal 1 – Sustain protection of public health and the environment

Goal 2 – Recognize and reduce risk

Goal 3 – Maintain a resilient infrastructure

Goal 4 – Increase communication, outreach and public confidence

This document highlights water security projects and partnerships managed or funded by EPA. For more information, visit water.epa.gov/infrastructure/watersecurity/.

Goal 1 Sustain Protection of Public Health & the Environment

Water Security (WS) initiative: The overall goal of this initiative is to design and demonstrate an effective system for timely detection of and appropriate response to drinking water contamination threats and incidents that will have broad application to the nation's drinking water utilities. The initiative is being implemented in three phases: (1) develop the conceptual design of a contamination warning system; (2) demonstrate, evaluate, and refine the contamination warning system design through full-scale pilot programs at drinking water utilities and municipalities; and (3) develop practical guidance and provide outreach and training to promote and support voluntary national adoption of a contamination warning system.

Currently, five Water Security initiative pilots are in different stages of deployment in Cincinnati, San Francisco, New York City, Dallas, and Philadelphia. Using information gathered through deployment of the Cincinnati pilot, EPA has published three interim guidance documents on drinking water contamination warning systems. The documents advise utilities regarding the design, development, deployment, and use of monitoring and warning systems.

Water Laboratory Alliance (WLA): The WLA provides the Water Sector with an integrated nationwide network of laboratories with the analytical capability and capacity to respond to drinking water contamination events. Launched in September 2009, the WLA is composed of public health, environmental, and commercial laboratories. The WLA leverages existing laboratory network capability and infrastructure and is designed to fill gaps in national laboratory preparedness for water analyses. The foundation of the Alliance is the Water Laboratory Alliance Response Plan (WLA-RP). It establishes a comprehensive, national laboratory response approach to water contamination events including preparedness, response, remediation, and recovery. In particular, the WLR-RP provides laboratories with a structure for a systematic, coordinated response to a water contamination incident that can be used in conjunction with existing Incident Command System (ICS) structure and procedure. Additional activities of the Alliance include laboratory response exercises and the development of chemical and biological methods. WLA membership has multiple benefits, including: improved laboratory emergency preparedness and response capabilities; improved communications with peer laboratories to help address emerging analytical, security, or operational challenges; access to validated methods for unregulated contaminants of interest to the Water Sector; and opportunities for water security-related training.

EPA/U.S. Department of Homeland Security (DHS) Coordination: EPA coordinates with DHS on critical infrastructure/key resource (CI/KR) activities to ensure a consistent approach to security across the Water Sector. EPA activities include participating in Water Government Coordinating Council (GCC) and Critical Infrastructure Partnership Advisory Council (CIPAC) working groups, and updating the Water Sector-Specific Plan (SSP) and Water Sector Annual Report (SAR).

Goal 2 Recognize & Reduce Risk

Risk Assessment Methodologies (RAM): Drinking water and wastewater utilities are encouraged to conduct or update risk assessments as well as to prepare or revise emergency response plans (ERPs) on a regular basis. Three risk assessment tools are widely used across the Water Sector: Risk Assessment Methodology – Water (RAM–W); Security and Environmental Management System (SEMS) emergency response checklist; and the Vulnerability Self-Assessment Tool (VSAT). EPA, DHS, and sector partners worked collaboratively to upgrade and revise existing assessment methodologies by using consistent vulnerability, consequence, and threat information within the Risk Analysis and Management for Critical Asset Protection (RAMCAP) framework. These actions resulted in analysis and calculation of risk that is comparable within the sector. Revisions to the tools also aligned with the features and elements of risk assessments as identified in the National Infrastructure Protection Plan (NIPP).

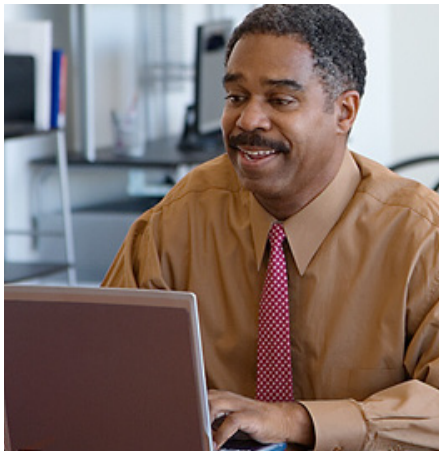
A revised version of EPA's VSAT software tool is also now available for download. Revised methodologies provide Water Sector utility owners and operators with qualified and quantified risk assessment processes to measure risk at the asset and system level; prioritize utility investments and efforts to mitigate risk; and, track utility risk management performance and investment over time.

Consequence Analysis: EPA-supported efforts on consequence analysis include coordination with the Water Sector and experts in risk assessments, utility operations, public health, and economics to analyze the potential health and economic consequences of various contamination and damage scenarios.

EPA has developed a generalized (threat-neutral) consequence analysis tool, the Water Health and Economic Analysis Tool (WHEAT), to assist in quantifying public health and economic consequences for a variety of asset-threat combinations that pose a risk for the Water Sector. WHEAT analyzes two different event scenarios—release of hazardous gas and loss of operating assets for drinking water systems—and provides information that can be used by utilities as part of a comprehensive risk assessment. The tool estimates the public health consequences (i.e., injuries and fatalities) for hazardous gas releases. Utility financial costs and regional economic impacts are estimated for both scenarios.

Future versions of the tool will include contamination scenarios and functionality for wastewater systems. The WHEAT loss of operating assets and hazardous gas release modules for drinking water systems are available for download.

Goal 3 Maintain a Resilient Infrastructure



Water Contaminant Information Tool (WCIT): This free, secure online tool has been created to support the Water Sector in preparedness, detection, response, and remediation. WCIT is a comprehensive database of information for 102 chemical, biological and radiological contaminants of concern for the Water Sector. In 2010, EPA integrated the National Environmental Methods Index for Chemical, Biological, and Radiological Methods (NEMI-CBR) database of analytical methods into WCIT, providing a one-stop, easy-to-use tool for the Water Sector. EPA continues to enhance the tool and update its information to reflect the most current data available to the Water Sector.

Water/Wastewater Agency Response Networks (WARNs): Intra-state mutual aid and assistance agreements, available to both private and public Water Sector utilities, facilitate the sharing of resources, personnel and equipment during events that disrupt drinking water and wastewater services. To date, WARNs have been established in 47 states and the National Capital Region.

EPA continues to provide support to help WARNs develop and evolve their programs. This includes sponsoring a variety of intra-state and inter-state exercises, providing tools and resources to WARN members and their partners and stakeholders, providing operational plan support to WARN programs whose plans have not yet been fully developed, and sponsoring annual meetings of WARN chairs. Recently, EPA published the first issue of a new, semi-annual WARN e-bulletin, *WARN Highlights*, which features articles and announcements from members of the WARN community, including EPA.

Emergency Response Exercises/Training: EPA, working with its partners in the states and national Water Sector associations, has conducted exercises and provided extensive training programs to improve coordination and communication between emergency response partners at the local, state, and federal levels. For example, EPA has sponsored state-wide emergency response exercises that examine Water Sector-specific issues. Recent exercises were completed in California, Arkansas, Missouri, Kentucky, and Tennessee. In addition, EPA provides training on the Incident Command System (ICS) and National Incident Management System (NIMS), which are national standards used by the Water Sector and its first response partners.

Tabletop Exercise Tool for Water Systems: EPA recently updated the *Tabletop Exercise Tool for Water Systems: Preparedness, Response, and Climate Resiliency* (TTX Tool) to include additional scenarios focused on both natural hazards and hazards imposed by climate-related impacts. The new TTX Tool is designed to provide the Water Sector with the necessary resources to plan, conduct, and evaluate tabletop exercises. Tabletop exercises allow water systems to practice, test, and improve emergency response plans (ERPs) and procedures. The TTX Tool simplifies the process of planning and conducting tabletop exercises, and provides resources that aid in the development of customized scenario-driven, discussion-based tabletop exercises. Additionally, EPA is conducting "train-the-trainer" sessions on the TTX Tool.

Community Based Water Resiliency (CBWR) Initiative: CBWR is designed to strengthen community resiliency by raising awareness of interdependencies with the Water Sector and the importance of incorporating the Water Sector into preparedness planning. The aim of CBWR is to enhance resiliency of communities in the face of water service interruptions from all-hazards threats. The main feature of the initiative is the Electronic Tool, which offers a budget-friendly suite of over 300 tools and resources to assist in water planning and preparedness across the entire community. A self-assessment portion of the tool provides communities with recommendations, tools, and resources to enhance water security and protection measures. Communication and outreach materials in the toolbox can be used to educate critical community partners and promote collaboration and partnerships between water utility owners and operators and the communities they serve.

Key Features of an Active and Effective Protective Program: The Key Features provide Water Sector stakeholders with the elements of a protective program and address physical, cyber, and human elements of prevention, detection, response, and recovery. The Key Features also promote a better understanding of the interdependencies between the Water Sector and other critical infrastructure sectors to enhance community preparedness in the event of a Water Sector emergency.

- **Seattle - King County Case Study:** EPA sponsored a pilot project in Seattle-King County, Washington in which it documented active and effective security and emergency practices underway in the community that protect its drinking water and wastewater utilities.

- **Chicagoland Case Study:** The Chicagoland Water and Wastewater Preparedness and Business Resiliency pilot project

demonstrated how to integrate security concepts into daily utility operations in order to reduce risk and enhance business resilience during a water service disruption.

Pandemic Influenza Plan: EPA supports DHS and the U.S. Department of Health and Human Services (HHS) in preparing the nation's drinking water and wastewater critical infrastructure for an avian or pandemic flu outbreak. EPA supports HHS by providing Water Sector input on pandemic and pre-pandemic vaccine and antiviral prioritization guidance. EPA recently conducted a webinar to gather lessons learned from the 2009 H1N1 pandemic and published a fact sheet that summarizes key lessons learned.

Federal Disaster Support: EPA provides federal disaster support under the National Response Framework (NRF) as a support agency to the U.S. Army Corps of Engineers (USACE) under Emergency Support Function (ESF) #3, Public Works and Engineering. Under ESF #3, EPA provides technical assistance to USACE in assessing the operating status of water and wastewater systems. EPA also provides assistance during hazardous material incidents involving contaminated water and wastewater systems, and during similar Water Sector-related incidents. EPA continues to collaborate with USACE by facilitating planning sessions to increase communication and coordination between all response partners.

EPA is also a key player in the National Disaster Recovery Framework (NDRF), which is targeted to providing support during the recovery phase of disasters. While still under development, EPA is tentatively identified as a support agency under the Recovery Support Function (RSF) for Infrastructure Systems. EPA is also working with Water Sector stakeholders to provide outreach information on federal disaster funding programs that could be applicable for water and wastewater utilities.

Decontamination Strategy and Technologies: The Water Sector Coordinating Council (SCC) and the GCC, through a CIPAC working group, identified Water Sector decontamination priorities and provided recommendations for a strategic plan to support these priorities. The plan identifies the need for information tools and resources that enable the timely recovery (and return to service) of utility operations from all-hazards contamination incidents. It addresses decontamination priorities related to the type of system (e.g., drinking water, wastewater), type of contaminant (e.g., chemical, biological, radiological), type of media affected (e.g., water, water infrastructure, decontamination equipment, household plumbing), type of incident (e.g., natural or man-made, accidental or intentional), and extent of contamination (e.g., concentrations, spatial and temporal variations). The strategic plan also helps to meet requirements for EPA under HSPD-10, which charges EPA with developing strategies, guidelines, and plans for decontamination.

All-Hazards Consequence Management Planning Document: The resource document, *All-Hazard Consequence Management Planning for the Water Sector* (All-Hazard CMP), was prepared by the Emergency Response (ER) CIPAC working group, and was finalized in November 2009. The document assists drinking water and wastewater utility owners and operators with development of templates for detection, response, and recovery plans. The All-Hazard CMP is an easy-to-use document for utilities, and includes: customizable check-lists of preparedness, response, and recovery actions that will improve resiliency; example incident-specific flow charts and checklists developed by a utility; and information on how the National Incident Management System (NIMS) and the Incident Command System (ICS) are used in preparedness and during response and recovery.

Goal 4 Increase Communication, Outreach & Public Confidence

Water Information Sharing and Analysis Center (WaterISAC): This tool is a mechanism for all-hazards security information within the Water Sector. WaterISAC facilitates sharing of information about physical and cyber threats, vulnerabilities, incidents, potential protective measures, and effective security practices. WaterISAC is a secure, Internet-based, rapid notification system and information resource for gathering, evaluating, conveying, and sharing security-related information on drinking water and wastewater systems; communications are geared to utility executives, managers, operators, and security officers.

More Questions? For more information on any of the projects listed, please visit EPA's water security website at **water.epa.gov/infrastructure/watersecurity** or send an email to **WSD-Outreach@epa.gov**.

If you have general questions about safe drinking water, please visit EPA's Ground Water and Drinking Water website at: **water.epa.gov/drink/hotline/index.cfm** or call the Safe Drinking Water Hotline at **1-800-426-4791**.