



Homeland Security
Technologies

ON GUARD

THE LATEST WATER SECURITY NEWS FROM THE MAKERS OF THE
GUARDIANBLUE® EARLY WARNING SYSTEM



GUARDIANBLUE IS CERTIFIED AND DESIGNATED BY THE DEPARTMENT OF HOMELAND SECURITY

HELPFUL WATER SECURITY HINTS

How do you know where to monitor your water in the distribution system—now there's help!

EPA's Threat Ensemble Vulnerability Assessment and Sensor Placement Optimization Toolkit software (TEVA-SPOT) can be used to assist water utilities by:

- *Recommending key sensor locations (e.g., water quality monitoring locations) in water distribution systems*
- *Identifying critical water utility and public health response times to minimize impacts*
- *Assessing the consequences of contamination incidents*
- *Helping improve water distribution system models*

TEVA-SPOT software, to be released later this year, can be used to determine the number and location of sensors that are needed to

support a contamination warning system. The location of online sensors can be optimized to help achieve such a system's primary goal: to detect contamination incidents in time to mitigate public health and economic consequences. TEVA-SPOT can also be used to meet additional design objectives—for example, minimization of costs, detection time, exposure to contaminants, and the spatial extent of contamination. In addition, the software can be used to demonstrate the importance of a fast response to a detected contamination incident.

In order to use TEVA-SPOT, it is necessary to have utility-specific input. Often, through the application of TEVA-SPOT, improvements to the distribution system models benefit the utility in other projects as well.

Visit the EPA website for more information. Hach Homeland Security Technologies offers consulting services to assist in your water security needs as well.

SPOTLIGHT ON:

Water quality in the distribution system.

SPENCER, Mass. – Spencer, a town of 12,000 people located about 10 miles west of Worcester had nearly 100 residents taken to hospitals in April 2007 after an accidental over-release of a chemical into the town water supply caused burning sensations and skin rashes. Almost all affected residents had been released the same night after being treated for minor skin or esophogal irritations. Complaints started early at about 6:30 a.m. from residents who had showered and reported skin irritation and moderate burns.

A malfunction at the town's drinking water treatment plant released too much sodium hydroxide into the drinking water supply. Sodium hydroxide, also known as lye, is routinely put into water to reduce water acidity and limit pipe corrosion, said Ed Coletta, a spokesman for the state Department of Environmental Protection.

Town Manager Carter Terenzini said that as of 11:30 a.m., about 12 people were undergoing "decontamination" treatment at St. Vincent's hospital in Worcester. He did not know how those people were exposed to the lye, whether from skin contact in the shower or while shaving, or directly from drinking the water.

A local representative stated local bottled water companies have dropped off drinking water for pickup at centralized locations. Officials had to act fast to make sure residents has access to clean potable drinking water. Without water, many businesses, such as a coin operated laundry service were forced to close while the water was being decontaminated.

Monitoring the quality of water as it exits the Drinking Water Plant and along its path before it is delivered to the tap is a simple way to verify the city's water department is delivering clean and potable water to your townspeople. (Sourced from the *Post Chronicle* and *The Boston Globe*.)

WATER QUALITY IMPROVED WITH MONITORING- SOLDIERS HAPPIER

A drinking water facility on a military base kept getting phone calls from consumers of their water who were complaining of a funny taste and odor. Each time a complaint was called in, a drinking water plant operator would drive to a water sampling point in the distribution system and test the water.

After several unsuccessful attempts at trying to figure out the cause of the odd water and persistent complaints, a series of water distribution monitoring devices were purchased and installed. These devices monitored the water quality on a continuous basis and therefore made it easier to respond and correlate the poor water quality to the complaints. They discovered low flow areas and dead heads within the distribution system.

With this new information in hand, the plant operators optimized their flushing schedule and greatly improved the water quality resulting in virtually no complaining phone calls.

Water Quiz

QUESTION 1

Has there ever been an intentional attack on drinking water supplies?

QUESTION 2

Has there ever been an unintentional contamination event of drinking water supplies leading to reduced water quality, damages or even death?

To find the answers, log onto www.hachhst.com and go to "Newsletter Quiz Answers."

IS THE WATER SUPPLYING YOUR DRINKING WATER PLANT OF GOOD QUALITY? HOW DO YOU KNOW IF THE INTAKE WATER QUALITY CHANGES?

Did you know various events can effect the water quality, the treatment of your drinking water and therefore your residents?

- Dissolved organic matter
- Intrusion of another source
 - Spring
 - Municipal or industrial waste
 - Acid mine drainage

- Produced water from oil and gas drilling operations
- Algal blooms
- Reservoir stratification or turning over
- Storm events
- Malicious contamination of the source water

Below is a sampling of a recent event in the world that resulted in a community not having any drinking water.

Recent Examples of Source Water Contamination

Incident	Source of Contamination	Country
Contaminated river shut water supply down for 4 days; schools shut down	chemical blast	China
Strychnine found in Reservoir, shut down reservoir	unknown	Denmark
7500 gallons of diesel spilled in river	tanker truck crashed	USA
15000 liters of diesel in river, direct source of valleys' entire drinking water	tanker truck crashed	Afghanistan
diesel oil in River	unknown	USA
13000 liters of diesel into river shutting down drinking water plant	auto workshop	New Zealand
Alum overflow from DWP—Alum delivery professionals overfilled Alum tank and excess went into river	drinking water plant	USA
Terrorist contaminant intentionally injected into river, shutting down DWP	terrorists	USA

SOURCE WATER MONITORING PANEL



Source waters can be vulnerable to an accidental or intentional contaminant events. Monitoring an input water source can provide useful information to the Drinking Water Plants that process incoming water. Plants can shut their intake down should their Source Water Panel parameters change significantly.

- Continuously monitor the quality of your incoming Source Water
- Anticipate changes to the treatment process that are needed to react to storms, algal blooms, industrial discharge, chemical spills, reservoir stratification/destratification, construction activity, sewage spills and other natural or man-made occurrences
- Improve process control—make necessary changes to your chemical quantities before the water enters your plant
- Improve your response time to changes in your incoming water
- Improve taste and odor problems
- Test up to six different parameters in one common trough, saving space and effort
- One controller for all sensors
- Can upgrade system with TOC analyzer or auto-sampler

For more information contact Hach Company—the leader in water quality testing for over 60 years at 1.800.604.3493 and ask for your local sales representative.

IS THE WATER BEING DELIVERED TO YOUR SOCIAL, ECONOMIC, AND POLITICAL ICONS SAFE TO DRINK?



This system diagram illustrates how Hach's GuardianBlue Early Warning System detects and alerts operators to deviations in water quality parameters within a city's drinking water system.

1. GuardianBlue systems are strategically located at key points throughout a city's water distribution system, such as pump stations, water treatment facilities and storage tanks.
2. If a contaminant is introduced into a water distribution system via a backflow attack, deviations occur in one or more of the measured water quality parameters.
3. Every 60 seconds, GuardianBlue analyzes the city's drinking water for deviations from baseline. The deviation caused by a contaminant, triggers a system alarm.
4. Operators at the water distribution monitoring facility are alerted to the problem in real-time and track the contamination movement in order to contain the affected water.



GUARDIANBLUE®

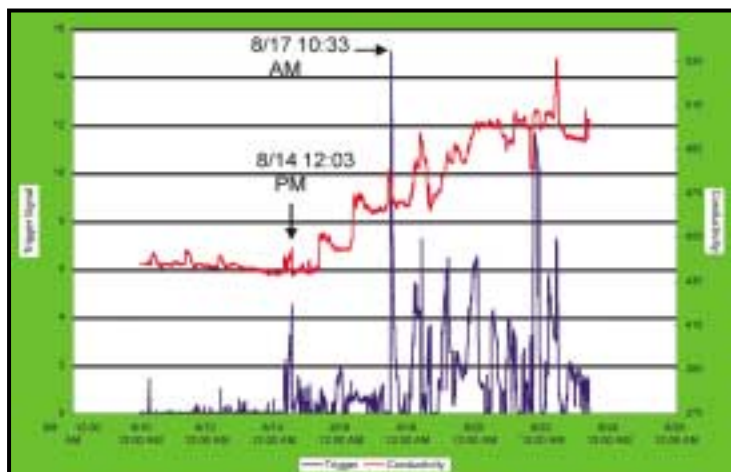
EARLY WARNING SYSTEM

DETECT CHANGES BEFORE YOUR CUSTOMERS DO.

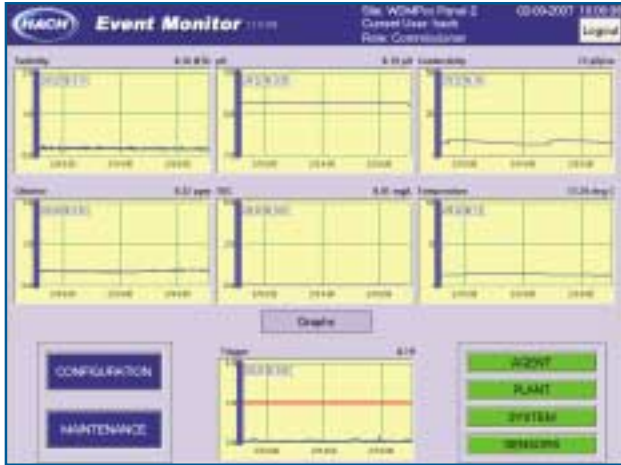
- Detect cross connection in real time
- Detect contamination events—intentional or accidental
- Stay alert to quality degradation due to water age
- Identify degradation in water quality due to biofouling or other events
- Monitor dead ends and low flow areas of the system
- Detect deviations caused by corrosion by-products, improve corrosion control
- Detect nitrification problems and ammonia overfeeds

Pipeburst Event

This graph depicts a 36-inch main break. GuardianBlue was 2 miles upstream and started to see significant deviations in water quality almost 3 full days before the catastrophic pipe break occurred.



THE FOLLOWING SCREEN SHOTS OF THE GUARDIANBLUE® EVENT MONITOR SHOW THE CLASSIFICATION PROCESS OF THE THREAT AGENT.



The GuardianBlue system uses normal water quality parameters to determine if the status of the quality of water in your distribution system.



The trigger signal uniquely combines all 5 water quality parameters into one dimensionless vector signal. This signal is an indication of the overall health of the water in the distribution system.



Trigger signal compares current water quality data to its baseline and once it "sees" a deviation from baseline, will alarm.



The trigger signal is compared to the agents housed in the Agent Library of the system and classifies the possible contaminant. This classification will help reduce the time it takes to identify the contaminant, possibly helping the team deploy the correct emergency response plan.

GUARDIANBLUE® THE FIRST EARLY WARNING SYSTEM TO RECEIVE SAFETY ACT DESIGNATION & CERTIFICATION



GuardianBlue is the first and only Early Warning System for drinking water to earn SAFETY Act designation and certification from the U.S. Department of Homeland Security. "Designation" means the product has qualified as an anti-terrorist technology, while "certification" means the product is approved for homeland security.

GuardianBlue's Event Monitor, Water Panel and TOC Analyzer have undergone Environmental Technology Verification from the EPA for continuous multi-parameter water monitoring in distribution systems. Hach's GuardianBlue Early Warning System alarmed on 100% of all contaminants injected into the system during ETV verification. For a full report, go to www.hachhst.com and download the ETV summary.



HACH COMPANY
P.O. Box 389
Loveland, Colorado 80539-0389
U.S.A.

PRSR STD
U.S. POSTAGE
PAID
NASHVILLE, TN
PERMIT NO. 1