



# Water Laboratory Alliance

## Background

Homeland Security Presidential Directive 9 (HSPD 9) directed the Environmental Protection Agency (EPA) to “develop nationwide laboratory networks for... water quality that integrate existing Federal and State laboratory resources, are inter-connected, and utilize standardized diagnostic protocols and procedures.” In response to HSPD 9, EPA’s Office of Water proposed and initiated the development of the Water Laboratory Alliance (WLA).

## Purpose

The purpose of the WLA is to provide the water/wastewater sector with an integrated nationwide network of laboratories with the analytical capability and capacity to support monitoring, surveillance, and remediation in response to intentional and unintentional water contamination events involving chemical, biological, and radiochemical contaminants.

## Approach for Development

The WLA is being developed based on existing networks. It is being designed to leverage existing laboratory network capability, capacity, and infrastructure to fill gaps in national laboratory preparedness for water/wastewater analyses. Laboratory infrastructure that is being leveraged from other networks includes analytical methods, membership criteria, and critical materials such as laboratory reagents.

The WLA integrates drinking water, wastewater, public health and environmental laboratories and select commercial laboratories that currently provide analytical support to government agencies. The WLA focuses solely on water and is an integral part of EPA’s Environmental Response Laboratory Network (ERLN). The ERLN is a network with a similar purpose as the WLA but will focus on analyses of all other environmental matrices.

## Benefits

Benefits of WLA participation include improved laboratory preparedness for response to emergency situations and improved communications with peer laboratories to help address emerging analytical, laboratory security, or laboratory operation challenges. In addition, WLA members will have access to water security-related training opportunities, analytical support to address analyses not conducted by their laboratory, and standardized analytical methods and data reporting systems. In the future, WLA laboratories will also have access to EPA-prepared proficiency testing samples for unregulated contaminants.

## WLA to Date

A number of activities have been initiated in support of the WLA. Activities completed to date include: development and evaluation of Regional Laboratory Response Plans for each of the 10 EPA Regions and an additional plan for Hawaii; identification of priority contaminants of concern, methods, and method gaps for priority contaminants; development of *Sampling Guidance for Unknown Contaminants in Drinking Water*; and development of training for Laboratory Chain of Custody and Evidence Preservation. Ongoing activities include: developing and validating chemical methods; funding the establishment of a Home Base for environmental laboratories; and initial development of quality control criteria for the Centers for Disease Control and Prevention Laboratory Response Network (CDC LRN) ultrafiltration device, which concentrates large-volume (up to 100 L) water samples for subsequent select agent analyses. WLA development activities include:

**Drinking Water Laboratory Response Preparedness Project.** The Office of Water and EPA Regional Laboratory Chiefs have developed Regional Laboratory Response Plans for each of the 10 EPA Regions and an additional plan for Hawaii to help with improving intra-regional laboratory preparedness for

responding to actual or suspected contamination events. The objective of this project is to develop a functional, customized region-specific laboratory response plan. Each regional plan has been revised based on the lessons learned during table-top exercises completed in August 2007. Functional exercises intended to assess region-specific laboratory capability and performance were completed in September 2008. The region-specific laboratory response plans will be updated based on the results of the functional exercises, as necessary. A national response plan will be developed based on the Regional Laboratory Response Plans and used to integrate the regional networks into a nationally-consistent Water Laboratory Alliance program.

**Chemical Method Development and Validation.** Through 2006, EPA's Office of Water targeted 16 unregulated contaminants of interest to the water sector for single-laboratory method validation by adapting existing drinking water methods. Method validation studies using ion chromatography (Method 300.1), high performance liquid chromatography (HPLC) with a fluorescence detector (Method 531.2), and HPLC with a UV detector (based on Method 532) were initiated. An additional study was also pursued to determine whether gas chromatography-mass spectrometry (GC-MS) Methods 524.2 and 525.2 were adequate to screen drinking water for unregulated contaminants. In addition, EPA's Office of Water collaborated with EPA's National Homeland Security Research Center (NHSRC) to conduct a method development study using gas chromatograph-mass spectroscopy (Method 525.2). The ion chromatography (Method 300.1) and GC-MS (Methods 524.2 and 525.2) studies were successful. The NHSRC study using Method 525.2 and the HPLC with UV detection study were also successful for some analytes.

During 2007, two follow-up method validation studies were conducted. The first was a multi-laboratory validation of Method 300.1 for two EPA Office of Water unregulated contaminants and the second was a single-laboratory validation of a liquid chromatography-mass spectrometry (LC-MS) method to address additional gaps in environmental capability.

**Ultrafiltration Quality Control (QC) Criteria Development Project.** The WLA currently relies on the CDC's LRN for concentration and analysis of select agents and toxins from large volumes (10-100 liters) of drinking water using the LRN *Filter Concentration for the Detection of Bioterrorism Threat Agents in Potable Water Samples* referred to as the "LRN UF" protocol. The LRN UF protocol requires comprehensive training and use to achieve and maintain proficiency. However, QC criteria to demonstrate proficiency with water have not been developed. As a result, there is a critical need for standardized QC criteria for implementation of the LRN UF procedure in support of the WLA.

The Ultrafiltration QC criteria study design was developed through a collaborative effort with subject matter experts from CDC and was approved by EPA in March 2008. The study includes an eight-phase approach requiring extensive preliminary analyses prior to development of QC criteria by up to 16 LRN volunteer laboratories. To date, a vegetative bacterium, virus, and spore surrogate have been evaluated and selected for use in the study. In addition, the applicability of BioBall™ spikes and the analytical methods have been deemed acceptable. Initiation of QC criteria development at the LRN laboratories will begin in 2009.

**Home Base for Environmental Laboratories.** EPA's Office of Water funded a cooperative agreement to initiate the development of a National Home Base for environmental laboratories to enhance capability and capacity of environmental laboratories and disseminate educational programs and tools for environmental laboratories. The effort enhanced the flow of information to and from environmental laboratories and increased the awareness of environmental water security issues.

## Contact Us

For more information on the WLA, contact EPA Office of Water's Latisha Mapp ([Mapp.Latisha@epa.gov](mailto:Mapp.Latisha@epa.gov)) or Anand Mudambi ([Mudambi.Anand@epa.gov](mailto:Mudambi.Anand@epa.gov)). Information on EPA Office of Water's activities, tools, products, and the latest scientific advances to protect drinking water and wastewater utilities is available online at <http://www.epa.gov/watersecurity>.