



CSC

# SDWARS

Safe Drinking Water Accession and Review System

## SEAMLESSLY MODERNIZING A CRITICAL LEGACY SYSTEM

In response to the 1996 amendments to the Safe Drinking Water Act (SDWA), EPA's Office of Ground Water and Drinking Water (OGWDW) established a program to monitor unregulated contaminants — contaminants suspected to be present in drinking water but do not have health-based standards set under SDWA. EPA's second cycle of monitoring was signed on December 20, 2006, and required public water systems (PWS) to monitor for 25 contaminants using five analytical methods during 2008 - 2010. Approximately 3,600 PWSs serving more than 100,000 people were affected by Unregulated Contaminant Monitoring Rule 2 (UCMR). The submission of results using the SDWARS database is mandatory for these stakeholders. Over a 5-year period, PWSs and laboratories performing the analyses will report

more than 18,000 analytical results and sets of quality control data to EPA and state governments using SDWARS.

### Meeting EPA's Regulatory Commitments on Schedule

Concerned about data integrity in the original SDWARS database and version control issues in software development for the initial CDX SDWARS/UCMR flow, EPA asked CSC to conduct a short-term problem analysis on the existing software and database and to recommend a solution for creating a new baseline. Subsequently, we developed, tested and successfully transitioned a new data system into the production environment. This included creating release notes, obtaining Integrated Project Team (IPT) approval, conducting a Production Readiness Review (PRR) and obtaining

*By swiftly addressing data integrity and software development version-control issues, CSC enabled EPA to overcome challenges that had hindered the effectiveness of the SDWARS database. In January 2008, a reengineered SDWARS that meets stakeholder needs better and is less expensive to maintain joined 40 other CDX data flow applications operating in the production environment hosted at EPA's National Computer Center (NCC) in Research Triangle Park, NC.*



**Benefits to Public Water Systems**

- Provides a single point of submission for both EPA and states
- Facilitates the review and approval of monitoring data
- Reduces the time required to identify problem water sources
- Ensures compliance with UCMR

**Benefits to EPA and States**

- Reduces errors and rework
- Facilitates the review and approval of monitoring data
- Reduces the time required to identify potential health risks
- Provides for the analysis of statewide and nationwide trends
- Cuts development and maintenance costs

Configuration Board Approval. We also made adjustments to address the new requirements in UCMR to meet EPA's 2008 regulatory deadline.

As the database receives analytical results from approved drinking water laboratories in support of the UCMR monitoring rule involving public water systems that serve more than 100,000 people, system performance continues to exceed EPA's high expectations.

**Overcoming Legacy System Barriers**

To develop the current production system, we analyzed the existing legacy system data, database and source code for the software and identified software defects, systemic problems and performance and other issues that might have impacted the integrity and use of the system. As a result of this analysis, we provided these solutions:

- **Version Control.** To resolve the version control issue, we created a new baseline for software and database design, and we tested and moved that baseline to production before further development occurred.
- **Coding.** To resolve the coding issue, we modeled and reengineered the database, moving all of the PL/SQL code to stored procedures and reanalyzing, verifying and repairing significant defects in the VB code.
- **Documentation.** To resolve documentation issues, the lack of requirements and design documents and the absence of a data model in electronic format, we developed documentation including System Requirements Specifications, the SDWARS Logical Data Model and the SDWARS Physical Database Design.
- **Maintenance.** To resolve code manageability and maintenance issues, we implemented an overall "refactoring" effort to break code into subroutines, classes or modules that are smaller or more tightly functionally related.

EPA received data with reduced logic errors and the time and cost of development was cut as a result of CSC's technical approach. In addition, maintenance costs are lower after 10 months in production. CSC also recommended and implemented the move from ASP to .NET. The result? Faster communication with EPA's CDX Node for archiving purposes and the generation of shared common modules for the reuse library.

**Delivering Comprehensive Customer Support**

Currently, CSC provides six major types of routine customer support services to SDWARS users, including access to a help desk and technical support, data submission tracking, reporting and verification, user guides and manuals, customer satisfaction surveys and the collection and reporting of performance metrics such as those involving application availability and downtime. As a result, SDWARS has required few enhancements and receives less than 10 help desk calls per month. In addition, no training has been required given the effectiveness of "On Page" documentation in increasing user understanding and the online availability of a User's Guide for Laboratories, a User's Guide for Public Water Systems and a list of Frequently Asked Questions.

**Future Enhancements**

The third cycle of UCMR is scheduled for release in 2013, with CSC development efforts supporting the next 5-year period to begin in 2010. Many of the service components and modules developed by CSC in the current application under Service Oriented Architecture (SOA) are expected to be reusable, which will greatly reduce EPA's time and cost of developing a system that complies with the new rule. Additionally, plans exist to better integrate SDWARS with the Safe Drinking Water Information System (SDWIS), also a CDX application.

**Recognition**

EPA's Office of Ground Water and Drinking Water, CSC's client for the UCMR program, has recognized the efforts and dedication that CSC's SDWARS team provided to ensure the highest level of client satisfaction in achieving goals while maintaining costs and consistently delivering a quality product. Some quotes from correspondence from the client include:

*"First off I'd like to say 'wow!' This is the most impressed I have ever been w/testing. I ran over 150 files & nearly every file was processed as it should have been. The error messages were clear & precise (not only line #, but reason). The bottom line: Very good job! It is obvious that those who worked on this really know how SDWARS2 is supposed to work. Really, all those who worked on the development of Release 3.5 deserve accolades."*

*"Wow! Am I impressed. Everything looks fine. Great job!!!"*

*"... what a wonderful experience it was to test SDWARS, as compared to past experiences. Things work like they are supposed to, data checks abound and flows very nicely. Overall, very impressive."*

**CSC North American Public Sector/Civil Group**

15000 Conference Center Drive  
Chantilly, Virginia 20121

+1.703.818.5555

[www.csc.com/epa](http://www.csc.com/epa)

Contact us at [epa@csc.com](mailto:epa@csc.com)