Western Kentucky University
Technical Assistance Center for Water Quality
Center for Water Resource Studies

"Supporting Small Water Systems in Meeting the Goal of Public Health Protection"

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Grant Number X83123601

Quarterly Report
for the period
July 1 – September 30, 2007

Submitted to:
U.S. Environmental Protection Agency
Office of Water
October 31, 2007

Introduction

The Technical Assistance Center for Water Quality at Western Kentucky University (TACWQ WKU) serves to support capacity development of small drinking water systems through the Utility Management Institute, a circuit rider, source water investigations, and information technology. The goal of the Center is to help small systems meet the requirements of the Safe Drinking Water Act (SDWA) and ensure public health. While focused on solving local problems that can serve as national models, the TACWQ is impacting small systems throughout the country.

The Center accomplishes its goals by relying on its diversified staff, in-house laboratory capabilities (WATERS), and subcontractors such as Kentucky Rural Water Association (KRWA) and Spatial Data Integrations (SDI). Below are the activities that were conducted toward these goals for the fourth quarter of the grant year, July 1-September 30, 2007.

Kentucky Rural Water Association

The Kentucky Rural Water Association (KRWA) provides training, technical assistance, advocacy, and a variety of other services and benefits to water districts, sanitation districts, water associations, and municipalities under 10,000 in population. KRWA's basic training and technical assistance services are provided to all utilities that request help, regardless of membership status.

Utility Management Institute

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by increasing the overall proficiency of community water system managers for providing safe water.

The Utility Management Institute (UMI) was created, in a collaborative effort between WKU and KRWA, to provide utility managers, and other utility personnel, with the opportunity to gain valuable knowledge and earn a university-based, professional designation in the field of management. These goals can be accomplished through the successful completion of six modern, practical management courses, specifically developed for public water utility personnel. The Utility Management Institute rewards its participants with the Utility Management Professional (UMP) designation after completion of all six courses.

During the quarter, the course entitled “Human Resource Management for Utilities” was presented in Pineville, Kentucky on July 11-12, 2007 at Pine Mountain State Resort Park. There were twenty-five (25) students participating in this course. “Modern Technology & Utility Management” was presented in Bowling Green, Kentucky on August 8, 2007 at Carroll Knicely Conference Center. There were forty-eight (48) students participating in this course. “Public Relations in Utility Management” was presented in Burkesville, Kentucky on September 12, 2007 at Dale Hollow State Resort Park. There were thirty-six (36) students participating in this course.

New UMI brochures were mailed during the quarter to promote the program and advertise the UMI class schedule for 2008.

The Utility Management Institute now claims a total of three hundred one (301) students. One hundred forty-one (141) of our students have now completed all six of the courses in the UMI Series and have been awarded the Utility Management Professional designation. Course assessments continue to show a high level of satisfaction with the training. During the year, one hundred eighty-one (181) of the one hundred eighty-three (183) assessors rated the session at the two highest levels, very beneficial or beneficial.

Small System Circuit Rider

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by providing on-site technical assistance to community water system operators.

The Small System Circuit Rider continues to provide quality technical assistance and training to management and personnel from small public water systems throughout Kentucky. This segment of public water systems, serving under 3,300 in population (especially those serving under 500 in population), is difficult to help through traditional means. These very small systems are often not eligible for assistance through our other Circuit Rider programs (USDA funded) because they are privately owned or are not credit worthy. Hands-on assistance delivered on-site, with active follow-up assistance, is the best way to help these systems comply with the ever-increasing complexities of the Safe Drinking Water Act (SDWA).

During the fourth quarter, the Circuit Rider position logged 357.75 hours. Of that, time 46% of the total time was spent directly assisting systems or their personnel including 98.5 hours on-site working with systems, 17.75 hours developing plans and reports for systems, and 48.5 hours providing formal training and program outreach.

The majority of time this quarter was spent assisting systems with source/supply issues. Activities for technical assistance included well disinfection, leak detection, GPS-GIS mapping and water quality monitoring. Compliance assistance included public notification and CCR. Management/financial assistance included water accountability, non-recurring charges and purchase water adjustments.

This quarter provided several opportunities to assist water utilities. One notable instance is outlined below.

Eastern Rockcastle Water Association – Located in Rockcastle County Kentucky serving 550 water customers.

The Eastern Rockcastle County Water Association, located in Climax, serves a rural community in eastern Kentucky. The utility purchases their water from three different suppliers. In recent years as wholesale rates have increased the Water Association has been able to absorb the slight increases due to the modest gallons purchased from certain suppliers. This year their largest supplier increased rates, which has placed the Association in the red by approximately $600-

$700 monthly. The Circuit Rider was requested to assist filing a Purchase Water Adjustment (PWA) with the Public Service Commission.

This adjustment will allow the Association to recoup the recent increase. This would not have been a problem had the Association filed the PWA within 20 days of notification from the supplier. However, that notification was published in the newspaper of the adjacent county. The Association was notified upon receiving the water bill the following month. Now that the 20-day window had passed for an essentially automatic PWA the Association had to pass a resolution to increase rates, prepare the filing, give public notice to their customers and allow for a 30-day comment period before their increase could go into effect. The Circuit Rider prepared all of the documentation for the filing, which was approved in September. The rate adjustment is in effect beginning October 15, 2007. After January 2008 the Circuit Rider will assist with a cost of service study to determine if a general rate case should be filed.

System Savings: $1,000 for the filing plus additional losses had not the filing been handled promptly.

Spatial Data Integrations

Spatial Data Integrations, Inc. (SDI) is a full service geospatial firm offering a wide variety of mapping services and geographic applications, including imagery processing, natural resource data collection, photo interpretation, geospatial file management and Geographic Information Systems (GIS). SDI provides customized GIS applications and services to rural utilities and small municipalities. SDI has close ties to the rural water community and strives to be an industry innovator.

Asset Management

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by developing an asset management tool for water systems to more efficiently inventory and track their infrastructure and physical assets.

Many small water utilities in the United States have had infrastructure in the ground for over 50 years, much of which is now coming towards the end of its life cycle. Increasingly, utilities are looking for monies or best practices that will enable them to rehabilitate their aging infrastructure and to continue to offer one of America's most critical public health, economic and environmental assets. Asset management is one practice that small utilities can use to maintain their infrastructure and plan for upcoming rehabilitation or replacement in a more efficient and cost-effective manner.

Spatial Data Integrations (SDI) is developing a pilot web-based asset management system for small systems based upon the existing EPA guidance document "Asset Management: A Handbook for Small Water Systems" (EPA-816-R-03-16). This tool will show the utility personnel and community leaders the 'big picture' of their aging infrastructure and allow them to effectively plan capital improvements and/or needed repairs.

During the fourth quarter of the drinking water grant, SDI continued to develop the Web-based Asset Management System for small systems. The system is currently in the final stages of Phase 4. Phase 4 included finalizing the login procedures, repairing some known bugs, finalization of help documentation and minor cosmetic changes. In addition, request for beta testers were sent to approximately 15 water utilities and 2 rural water associations. To date, confirmation has been received from 1 utility and both rural water associations, with 1 completed questionnaire returned.

The pilot application can be accessed by navigating you web-browser to http://sdi.waterky.org/AMS/home.asp. A username and password are required in order to gain access and can be obtained by contacting Trey Lyon at tlyon@sdimaps.com or (502) 213-0981.

The system is approximately 80% complete with finalization anticipated for December 2007. Beta testing will continue through this time with emphasis on obtaining an additional small water utility to sign on as a beta tester, and further customization based upon comments.

Technical Assistance

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by providing TACWQ personnel with GIS expertise and capabilities, which will further the TACWQ's mission of providing small water systems with infrastructure mapping assistance.

SDI has continued to provide approximately 300 square feet of office space and high-speed Internet access to TACWQ staff members and student workers and technical assistance on geospatial related tasks.

WATERS Laboratory

Water Analysis, Training, Education and Research Services (WATERS) is a water quality laboratory located on WKU's campus. WATERS espouses the following integrated goals through cooperation:

a) **Water Analysis**: Certified drinking water laboratory for chemical and biological analyses.

b) **Training**: Providing training of field, laboratory and environmental technicians serving an immediate need for the Commonwealth of Kentucky.

c) **Education**: Student certification program, hands-on work experience for undergraduate students in the environmental science field.

d) **Research**: Developing more accurate and cost-effective methods of analysis for microbial source tracking.

e) **Service**: Enabling local, state and regional private and public sector entities to meet environmental management goals through the provision of high quality environmental data collection, management and analysis.

Small Systems Partnership for Compliance Monitoring

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by reducing the financial burden on small water systems of routine water quality analyses required under the SDWA.

WATERS continues to partner with small water systems in Kentucky for the purpose of establishing effective and economical methods for meeting compliance monitoring requirements. During the quarter, microbiological analyses were conducted for 9 drinking water systems with populations less than 10,000. Five of these systems have populations less than 3,300. A total of 139 analyses were conducted for these nine systems during the quarter. Bacteriological Analysis Report Forms were sent to the KY Division of Water electronically in compliance with state reporting requirements.

Microbial Source Tracking Analytical Method Development

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by establishing cost-effective methods of tracking source water contamination.

The ability to track bacterial contaminants in water to their source is a major focus of source water protection. Many research projects have been performed on the subject. However, the only conclusion that most research has reached is that each region of the research area possesses different microorganisms in its waters. This proposal is to study source tracking techniques in the Lower and Upper Green River Watershed region of the Commonwealth of Kentucky. The ultimate environmental outcome of the project is cleaner source water by identification and reduction or elimination of the sources of fecal contamination in source waters. An extension of this work could lead to a reduction in the amount of treatment needed to make surface waters potable, thereby reducing costs.

During the quarter, plasmids were generated for the DNA fragments that will be amplified using human- and bovine-specific primers. The plasmids were isolated from the host cells and experiments were undertaken to ensure they work properly. Calculations were performed to determine the exact copy numbers of the plasmids.

The specific samples to be tested were selected based on several criteria including: E. coli data generated for the sample, concentration of DNA in the sample, and repeat sampling of the same sampling location.

LT2 Rule: Cryptosporidium Assistance

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by assisting water systems with implementation of the Long Term 2 Enhanced Surface Water Treatment (LT2) Rule.

A presentation on compliance with the LT2 Rule was given in London, KY on September 18. A total of 56 drinking water operators were in attendance at the meeting, where continuing education credits were offered.

In July the WATERS Lab changed its method for IMS dissociation from acid to heat. An Initial Performance and Recovery (IPR) set was analyzed to prove the new method is comparable to the old method. As a result of this change, an average of 82% recovery for *Cryptosporidium* and 54% recovery for *Giardia* was achieved during the August 2007 round of EPA Protozoan Proficiency Testing (PT). In September, two samples for Schedule 4 systems (<10,000 population) were analyzed. Although Schedule 4 systems are not required to begin monitoring until October 2008, these systems took a proactive approach to monitoring. This will give them more time to evaluate treatment options if additional treatment is required.

Center for Water Resource Studies

Environmental Informatics

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by increasing the amount of information technology available to water systems, and presenting it in a format that is easy to understand.

Specific activities under this objective include:

Decision Support System

The Decision Support System (DSS) is a planning resource that serves to establish partnerships and assist stakeholder groups in minimizing the effects of agricultural, industrial, and municipal impacts on source water. The DSS will incorporate a rules based system to allow for a customizable schedule.

The CWRS web site has been converted to a content management system (CMS) that will allow water systems to easily share information, and includes managed groups. ArcGIS Server has been installed and applications are being developed to view data. Since the TACWQ was added to the CMS, the main page has been visited 780 times (http://waterky.org/index.php?q=TACWQ). The download section for the tools available through CWRS has been visited 72 times.

System Mapping Assistance

Many rural water systems lack the technology and skill required to digitally map their infrastructure. Rural systems without GIS data collecting capabilities will be assisted, through mapping efforts of the Center. Field crews will be deployed to collect GIS information that will be incorporated into the DSS and Asset Management tools. This data will also be provided to the systems in a digital format. A minimum of two rural water systems will be provided

mapping assistance through this grant. The systems in need of assistance will be identified through Kentucky Rural Water Association.

During the quarter, GPS was used to map all of the water features in Adairville, KY. A map is currently being created using GIS and the city will be provided with a large paper map upon completion, along with a published map file that includes all of the data that was collected.

Relational Database Tool

Large volumes of laboratory data from different sources have made data exchange between different applications very difficult. In this project, we plan to expand on software previously developed to facilitate data exchange.

An XML format tool to convert OCR documents has been developed. This tool was added to the new TACWQ website this quarter.

Web Page Hosting

Many small water systems do not have the financial or technical resources to develop and host their own websites, yet currently websites are one of the best tools to quickly disseminate information to the public. Using the website as a media to transmit information to clients within the rural water district, systems can quickly provide information about water quality (CCR reports), boil water advisories, meeting times and locations, and additional crucial information.

The KYWARN system is now online and is ready for water systems to register. It can be found at the address kywarn.org. This system will allow water districts to request and provide mutual aid to each other.

Technology Training

As the use of technology develops, the need for technology training increases. A presentation for water districts will be provided at a local or state conference to help demystify the technology tools available to them. Areas to be included will be web site development, applicable software tools and basics of their use, and basic PC support. Topics covered will include tools previously developed by the TACWQ and other states. CDs of the available tools will be distributed to attendees of the presentation. Also covered will be basic computer terms, backup information, open source software that is available, viruses, firewalls, and other computer security issues.

In addition to the conference presentation, a technology training manual is currently under development. It will include documentation on tools developed by the TACs, commercial software, and open source software that is available to water systems. Basic instructions on using technology for marketing, customer awareness, and system evaluation will also be included. This manual will be available in hard copy form or on a CD, and can be used by small water systems throughout the country. A draft of the technology training manual was developed this quarter, and is available at: http://waterky.org/index.php?q=node/718

Center Coordination

This project supports EPA Strategic Plan Goal 2 of Clean and Safe Water, Objective 2.1: Protect Human Health and Sub-Objective 2.1.1: Water Safe to Drink by providing outreach to small water systems, and maximum efficiency between all project team components and concurrent activities.

Specific activities under this objective include:

Quarterly Reports

The TACWQ will continue to provide quarterly technical and financial status reports to the EPA project officer. This is the fourth quarterly report for the current grant year, which covers the period July 1, 2007 to September 30, 2007.

Education and Outreach

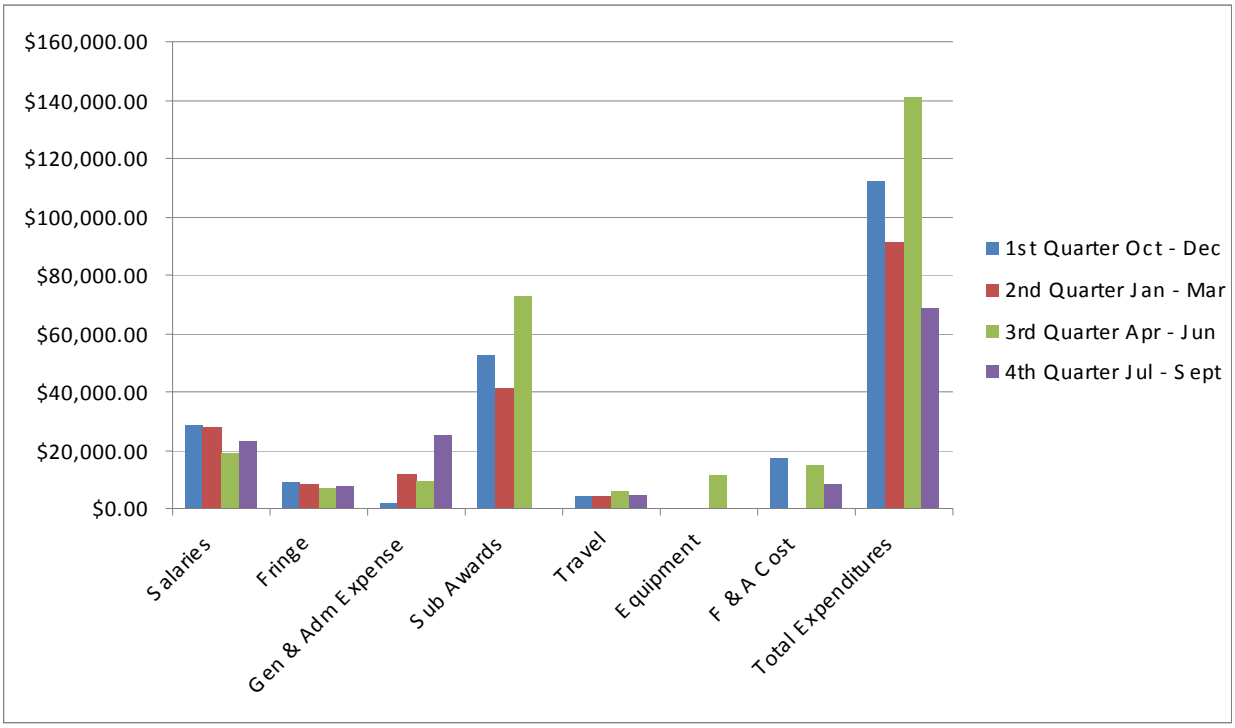
During the quarter, the CWRS display was exhibited at AWWA's KY/TN Water Professionals Conference in Louisville, KY from July 15-18, 2007. Christal Wade attended KRWA's annual conference in Louisville from July 27-29. Jana Fattic attended a Barren River Area Development District (BRADD) Water Management Council meeting in Bowling Green on July 19.

Kentucky's Division of Water (KDOW) has recently formed a statewide steering committee comprised of public water systems and technical assistance providers throughout the state for input on various regulatory issues. Several subcommittees have developed from the original steering committee. Dr. Andrew Ernest was invited to sit on the steering committee. CWRS employees are involved in many of the subcommittees. Dr. Ernest attended a Steering Committee meeting in Frankfort, KY on July 9, 2007. Dr. Ernest also attended a KDOW Capacity Development Subcommittee meeting in Frankfort on July 24, and Jana Fattic attended the second monthly meeting in Frankfort on August 21. Christal Wade attended the KDOW Compliance Subcommittee meeting in Frankfort on July 30, and Gretchen Grover attended a second meeting in Frankfort on September 24. Jana Fattic attended KDOW Regulations Subcommittee meetings in Frankfort on August 3 and in Elizabethtown, KY on September 14.

Stakeholder Advisory Council

A Stakeholder Advisory Council (SAC) meeting was held during the previous quarter in order to ensure that activities, proposed and ongoing, of the TACWQ accurately reflect the needs of its constituents. The SAC provides advice to the TACWQ Director on strategic issues related to the science and technology missions of the TACWQ including insights on research directions and policy, and perspectives from the broader community and political scene.

Budget



Expenditure Category	1st Qtr Oct - Dec '06	2nd Qtr Jan - March '07	3rd Qtr April - June '07	4th Qtr July - Sept '07
Salaries	$28,609.81	$28,047.95	$18,930.92	$23,068.36
Fringe	$8,689.04	$8,544.71	$7,115.25	$7,774.85
Gen & Adm	$1,551.83	$11,656.14	$9,449.76	$24,935.53
Sub Awards	$52,361.44	$41,395.39	$72,778.91	$0.00
Travel	$3,916.99	$4,234.49	$6,094.54	$4,576.45
Equipment	$0.00	$0.00	$11,547.53	-$5.61
F & A Cost	$17,156.65	-$2,750.87	$15,027.97	$8,328.17
Total	$112,285.76	$91,127.81	$140,944.88	$68,677.75