



New arsenic standard: assistance providers, regulators, communities prepare to comply



The town of Goldfield, county seat of Esmeralda County, Nevada, cannot meet the new maximum contaminant level for arsenic without treatment. Two wells pump directly to distribution and serve 249 connections; the wells test at 44 and 47 ppb. Goldfield officials are seeking funding. Photo courtesy of Philip Walsack, Rural Community Assistance Corporation.

by Pam Kasey
NETCSC Contributing Writer

Uncertainty over who would be affected by the new, lower drinking water standard for arsenic ended last October when the U.S. Environmental Protection Agency (EPA) announced the 10 parts per billion (ppb) maximum contaminant level (MCL).

With the announcement, the task of arsenic remediation passed into the hands of technical assistance (TA) providers, state drinking water administrators, and local water systems. EPA estimated that 4,100 water systems of 74,000 regulated by the new standard would need to take measures to comply.

Nearly all affected water systems are relatively small, serving fewer than 10,000 people. As these systems work toward the January 2006 compliance deadline, TA providers and state regulators across the country will help them understand the details of the new regulation and achieve arsenic compliance.

Safer drinking water

Amendments Congress made in 1996 to the federal Safe Drinking Water Act (SDWA) directed the EPA to issue new regulations on arsenic in 2001. In so doing, the EPA weighed the benefits and costs of more protective arsenic regulation.

The benefits come to us in better health. Chronic (long-term), low-level ingestion of arsenic can produce cancers of the skin, bladder, lung, kidney, and other organs. Arsenic may also affect the nervous and circulatory systems and is associated with diabetes and heart disease.

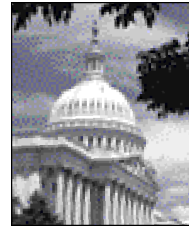
Reducing arsenic in drinking water to 10 ppb is expected to prevent 19 to 31 cases of bladder cancer and 19 to 25 cases of lung cancer, and at least 20 deaths from the two cancers, each year. Other cancers and non-cancerous health improvements add to the benefit, but EPA places a value on the reduced incidence of bladder and lung cancer: \$140 to \$198 million nationally each year.

These benefits are balanced with the cost. At the 10 ppb level, installing new treatment systems, operations and maintenance, and monitoring and administrative costs are estimated to come to some \$180 million nationally each year.

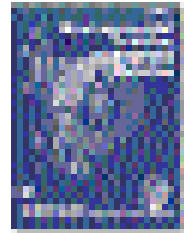
The new rule brings the U.S. arsenic level more into line with the rest of the world: it is now more protective than the Canadian level of 25 ppb, and equivalent to the World Health Organization's 10 ppb provisional guideline.

Who is affected?

Data for arsenic levels below the 50-year-old standard of 50 ppb are incomplete. However, arsenic in groundwater typically *continued on page 6*



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NETCSC provides link to tribal environmental site

The National Environmental Training Center for Small Communities' (NETCSC) Web site now provides a link to the National Tribal Environmental Network, or NTEN.

Sponsored by the National Environmental Services Center (NESC) and NETCSC, the NTEN Web site was created to help meet the environmental needs of tribal communities. "This Web site is designed to increase communication among tribes and the public regarding tribal environmental issues," says John Hoornbeek, NETCSC director.

The NTEN Web site provides information about tribal environmental training events, the

NTEN advisory panel, and links to organizations involved in a collaborative partnership to assist tribes with managing their drinking water, wastewater, and solid waste.

To access NTEN, visit NETCSC's Web site located at www.netc.wvu.edu and select "NTEN" from the homepage. 



Calendar of Events

National Association of Towns and Townships' America's Town Meeting

September 4 – 6
Washington, D.C.
(202) 624-3550
www.natat.org/natat

National Recycling Coalition's 21st Annual Congress & Exposition

September 8 – 11
Austin, TX
(202) 347-0450
www.nrc-recycle.org

National Onsite Wastewater Recycling Association's 11th Annual Conference & Exposition

September 18 – 21
Kansas City, MO
(301) 776-7468
www.nowra.org

Water Environment Federation's WEFTEC 2002 75th Annual Conference & Exposition

September 28 – October 2
Chicago, IL
(800) 666-0206
www.wef.org

International City/County Management Association (ICMA) Annual Conference

September 29 – October 2
Philadelphia, PA
(202) 289-4262
www.icma.org

Association of State Drinking Water Administrators 17th Annual Conference

September 30 – October 3
Salt Lake City, UT
(202) 293-7655
www.asdwa.org

National Rural Water Association Annual Leadership Forum & Technology Exhibit Center

October 6 – 9
Spokane, WA
(800) 332-8715
(580) 252-0629
www.nrwa.org

American Water Resources Association's 2002 Annual Conference

November 3 – 7
Philadelphia, PA
(540) 687-8390
www.awra.org

Groundwater Foundation's 2002 Annual Conference

November 18 – 20
Eugene, OR
(800) 858-4844
www.groundwaterfoundation.org



AEA offers certification, degree via Internet

Water and wastewater plant operators in Arkansas and other states may now complete certification training or earn an associate's degree via the Internet, thanks to a new program available through the Arkansas Environmental Academy (AEA). AEA—a division of Southern Arkansas University Tech, located in Camden—is the Arkansas state training agency for water and wastewater professionals.

AEA has been working for more than a year to develop courses and to get them online. "Our goal is to better prepare today's operator with the tools needed to protect our environment and health," says Mike Thomason, AEA instructor. "We're trying to move into the modern era and especially to help the operators of small systems."

Through AEA's online training program, students may earn a two-year associate's degree in environmental science (61 credit hours) as well as complete certification or



recertification training. Environmental professionals also may be eligible to earn up to 12 college credit hours for previous certification training. Thomason also points out that the training is not just limited to students or operators in Arkansas. Other states can have the courses approved for use in their state as well.

AEA provides training on campus and via the Internet on water treatment and distribution, wastewater collection and treatment, solid waste, and backflow certification. Currently AEA trains 3,000 students per year, but hopes to see this number increase as more people make use of the online training program, says Thomason.

For more information about AEA's online training program, contact Larry Hazel, AEA program director, at (870) 574-4540 or lhazel@sautech.edu. You may also visit AEA's Web site located at www.sautech.edu/aea.htm.

NSFC's Regulations Database now online

The National Small Flows Clearinghouse's (NSFC) Regulations Database can now be accessed online at www.nesc.wvu.edu/nsfc/nsfc_regulations.htm.

The Regulations Database provides access to onsite wastewater treatment regulatory documents for 48 states. This information will be useful for environmental professionals seeking information about a particular state's onsite wastewater treatment regulations or wanting to compare regulatory structures between states. It will be particularly useful to states seeking assistance in revising regulations.

The NSFC collects and maintains information about onsite wastewater treatment regulations, but does not interpret regulations. Database users seeking interpretation or additional information about a state's regulations should contact the state's onsite wastewater regulatory agency. A list of state contacts also is available on the NSFC's Web site at www.nesc.wvu.edu/nsfc/nsfc_regulations_contacts.htm.

The NSFC maintains four additional databases. These include the Bibliographic Database and the Manufacturers

and Consultants Database, both of which are accessible online, and the Facilities Database and the Contacts and Referrals Database.

For more information about any of these databases, visit www.nesc.wvu.edu/nsfc/nsfc_databases.htm on the Web or call the NSFC at (800) 624-8301 or (304) 293-4191 to request a free brochure about the NSFC's databases.

NSFC offers news listserv

Environmental professionals interested in receiving news about products and services the National Small Flows Clearinghouse (NSFC) offers are invited to subscribe to the NSFC's electronic mailing list. This listserv notifies subscribers via e-mail of NSFC activities and other information about sewage treatment options for homes and small community developments.

Please note that the NSFC's listserv is for notification only and cannot be used to post messages.

To subscribe to the NSFC news listserv:

- send an e-mail to subnsfcnews@mail.nesc.wvu.edu (no additional text is required), or
- log onto www.nesc.wvu.edu/nsfc/nsfc_listserv.htm and enter your name and e-mail address in the corresponding fields.

For more information about the NSFC, call (800) 624-8301 or (304) 293-4191 and request a free information packet.

U.S. Congress passes Bioterrorism Preparedness and Response Act Water systems prepare to comply with new law

by Ann Murray
NETCSC Contributing Writer

It has been nearly a year since the terrorist attacks of September 11, 2001, but the effects of that day are still rippling through water systems all across the country. Although many systems have already taken steps to increase security, new federal legislation mandates that community water systems serving more than 3,300 people perform vulnerability assessments. This new law will affect water systems throughout the country as well as the trainers and technical assistance providers who work with them.

In May, the U.S. Congress passed the "Public Health Security and Bioterrorism Preparedness and Response Act of 2002." In June, the President signed the bill into law, thus amending the Safe Drinking Water Act (SDWA). The new law requires each community water system serving a population of more than 3,300 people to conduct an assessment of the system's vulnerability to a terrorist or other intentional act, submit a copy of the assessment to the U.S. Environmental Protection Agency (EPA), and prepare or revise an emergency response plan.

The act directs EPA to provide guidance and support to water systems and authorizes appropriations to carry out the new requirements. The act also increases penalties under the SDWA for tampering with drinking water systems.

Now, communities with more than 3,300 people but fewer than 50,000 people will have to certify in writing to EPA that their drinking water systems have completed a vulnerability assessment and submit the assessment to EPA by June 30, 2004. Additionally, an emergency

response plan must be completed by the systems within six months after completion of the vulnerability assessment.

Systems serving 50,000 to 100,000 people must certify and submit assessments to EPA by December 31, 2003, while systems serving more than 100,000 must do so by March 31, 2003. These larger utilities must also complete emergency response plans within six months of their vulnerability assessments.

Under the new law, communities with fewer than 3,300 people are not required to perform vulnerability assessments. However, the law states that EPA shall provide guidance to these smaller community water systems on how to conduct assessments, prepare emergency response plans, and address threats from terrorist attacks or other intentional disruptive actions.

EPA has already been working to help drinking water and wastewater systems with vulnerability assessments and emergency response plans. In the past two years, the agency has worked with other federal agencies, including the Federal Bureau of Investigation, the Department of Defense, the Centers for Disease Control and Prevention, and the Food and Drug Administration, to identify threats to drinking water and wastewater systems as well as methods to deter, detect, or mitigate these threats. These elements have been cornerstones of EPA's water security strategy and—until the recent passage of the new water security law—have been promoted on a voluntary basis.

According to the EPA Water Protection Task Force, the agency is currently working with states to provide technical assistance and guidance on accomplishing vulnerability assessments and emergency response plans for small systems that serve fewer than 3,300 people. The new law also authorizes funding for this task. Prior to awarding funds, EPA will work with states to develop a process for determining priorities for the use of funds and the order in which facilities shall receive funding.

Providing help with vulnerability assessments to the numerous small and rural water systems in the nation is a challenging task. Andy Bielanski, small systems expert with the EPA Water Protection Task Force, says that's why from the beginning "EPA has looked to partner with states, agencies, technical assistance organizations, and other water professionals to provide the necessary assistance. EPA will utilize the existing framework of assistance providers at the national, state, and local levels to accomplish its security goals."



Visit NETCSC's online security training calendar

For the latest information about security-related training events for drinking water and wastewater system personnel, visit the National Environmental Training Center for Small Communities' (NETCSC) Web site at www.netc.wvu.edu. To access the online security calendar, click on the red "Security Information" graphic on NETCSC's homepage.

To submit information about a training event for the calendar, contact Craig Mains, NETCSC training specialist, at cmains@mail.wvu.edu. Please include a description of the training event, location, date, registration fees, and contact information (including a Web address, if available).



Wastewater vulnerability assessment tool now available


Although wastewater utilities are not yet required by law to perform vulnerability assessments, the U.S. Environmental Protection Agency's (EPA) Water Protection Task Force encourages utilities to conduct assessments. To that end, EPA has provided funding to the Association of Metropolitan Sewerage Agencies (AMSA) to develop a Vulnerability Security Assessment Tool (VSAT) for wastewater systems.

The VSAT software is a comprehensive and easy-to-use tool for wastewater utility professionals seeking to assess their utility's vulnerabilities, develop priorities based on cost and feasibility of remediation, and determine potential solutions for the prioritized vulnerabilities.

According to Curt Baranowski, a member of EPA's Water Protection Task Force, any size wastewater system can use VSAT. "VSAT is an intuitive tool that can easily be tailored to the

security parameters of small, medium, or large operations," says Baranowski.

The VSAT software is an adjunct to AMSA's *Asset Based Vulnerability Checklist for Wastewater Utilities*, a publication designed to help utility personnel identify and evaluate a range of vulnerabilities that could put their assets (physical plant, employees, knowledge base, information technology, and customers) in jeopardy. (The checklist may be downloaded from AMSA's Web site at www.amsa-cleanwater.org/pubs/2002avcheck.pdf or purchased in hard copy form from ASMA.)

VSAT is available free of charge to all public wastewater utilities. Visit AMSA's Web site at www.amsa-cleanwater.org/about/about.cfm to request a copy of the VSAT software. For technical assistance regarding the software, visit www.VSATusers.net or call (888) 340-8830. 

EPA Region 1 offers wastewater security workshops


To address wastewater treatment plant vulnerabilities, the New England Interstate Water Pollution Control Commission (NEIWPCC) is collaborating with U.S. Environmental Protection Agency Region 1 and the New England Water Environment Association (NEWEA) to conduct a series of security training workshops for wastewater infrastructure across New England.

The workshops will help prepare wastewater utilities for water infrastructure security risks by delivering critical information to wastewater treatment plant operators and municipal officials. Issues such as how to mitigate security threats and how to react in the event of a crisis will be covered. The sessions will offer the perspective of the host state's regulatory agency, national planning tools, and an example vulnerability assessment of a treatment plant in that state.

Eight wastewater security workshops planned for New England began in June. Remaining workshops include:

- August 13—Portland, ME
- August 27—Waterbury, VT
- September 17—Hartford, CT
- September 25—Brewer, ME
- October 8—Springfield, MA

Workshops were held in Warwick, Rhode Island, Chelmsford, Massachusetts, and Concord, New Hampshire, in June and July.

For registration information, please contact NEWEA at (781) 939-0908 or visit its Web site located at www.newea.org. 



Security guidance documents available

The Association of State Drinking Water Administrators (ASDWA) and the National Rural Water Association (NRWA), in collaboration with the U.S. Environmental Protection Agency (EPA), are making guidelines available to help small systems complete vulnerability assessments.

The *Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems* has a simple design and will help small systems determine security weaknesses and identify ways to correct them. This document is designed particularly for systems that serve populations of 3,300 or less. The guide can be viewed or downloaded from ASDWA's Web site at www.asdwa.org.

EPA's Water Protection Task Force has prepared the document, *Guidance for Water Utility Response, Recovery and Remediation Actions for Man-Made and/or Technological Emergencies*. The guidance document outlines the minimum actions that EPA recommends a water utility carry out for five incident types, including:

- threat or actual intentional contamination of the water system,
- threat of contamination at a major event,
- notification from health officials of potential water contamination,
- intrusion through the Supervisory Control and Data Acquisition (SCADA) system, and
- significant structural damage resulting from an intentional act.

This document may be downloaded from EPA's Web site at www.epa.gov/safewater. 

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reaches levels higher than that in surface water. Existing data show the greatest concentrations of wells with arsenic above 10 ppb in the western states. Parts of the Midwest and New England and scattered communities elsewhere across the country also test high. (See map on page 7.)

Of the 4,100 drinking water systems estimated to need treatment, approximately 3,000 are community water systems (CWS)—public water supplies that serve at least 15 locations or 25 residents year-round, including not only towns but also places like apartment buildings and mobile home parks that have their own treatment systems.

The remaining 1,100 are non-transient non-community water systems (NTNCWS), systems that serve at least 25 of the same people for at least six months out of the year in such places as office buildings, schools, and hospitals. Transient non-community water systems, such as gas stations and campgrounds, are not regulated by this standard.



With its one well testing at 50 ppb, Manhattan, Nevada, population 40, will be affected by the arsenic rule. Nye County is looking for money to test a long-abandoned well, in the hopes that it is operable and meets the arsenic MCL. Here, county utilities operator Bob Brown (left) and Rural Community Assistance Corporation TA provider John Dailey inspect the old wellhead. Photo courtesy of Philip Walsack, Rural Community Assistance Corporation.

Water systems prepare

As states and local communities begin to think through their approaches to arsenic compliance, some are considering simply abandoning water supplies that test too high. For example, most affected North Dakota systems will be able to join regional water systems. Bad Axe, Michigan, is looking

at switching its water supply from local wells to Lake Huron. Many Idaho water systems may be able to comply by shutting down and, in some cases, replacing affected wells.

In some states, though, most or all of the affected systems will have to install treatment. For example, Nevada towns are typically 20 and 30 miles apart, and can be as far as 60 miles from each other. Consolidation is not feasible. “Most Nevada towns are going to have to build a treatment system,” says Philip Walsack, environmental specialist for the western Rural Community Assistance Corporation (RCAC).

According to Walsack, that’s 79 of the state’s 169 CWSs testing over 10 ppb, and 38 of 370 NTNCWSs.

“Right now, most communities don’t even chlorinate their groundwater sources—they just pump into the distribution system,” Walsack notes. Nevada’s Bureau of Health Protection Services, RCAC, and the state Rural Water Association will need to be ready to help communities choose, purchase, and install treatment systems. An extensive amount of training will be required, too. “All those people are going to have to get certified as treatment operators, not just distribution operators,” says Walsack.

In Nebraska, the heart of the Midwest, most communities affected by the new rule draw from a single aquifer, so Idaho’s solution of replacing wells does not apply. Most of the state’s 59 CWSs and 19 NTNCWSs testing over 10 ppb will have to treat. Nearly all of these systems are classified as small or very small.

Art May, Nebraska-based training director for the Midwest Assistance Program (MAP), wants to be sure there are technologies that are truly appropriate for small communities. “One problem we consistently face is taking something that will work for a town of 5,000 and trying to modify it for a town of 500. It’s rarely a cost-effective or efficient way of doing things,” he explains.

May is concerned, too, about funding. In his experience, “those with the least need and highest per capita income have the greatest success; those with the greatest need and lowest per capita income have the fewest local resources—knowledge, expertise, and sometimes motivation and leadership—to chase down the funds that are available. That’s a critical place for technical assistance.”

In Nebraska, technical assistance is provided by the state’s “Two Percent Team”—funded by the Drinking Water State Revolving Fund (DWSRF) two percent set-aside—and includes MAP as well as the Nebraska Rural Water Association, the Nebraska Environmental Training Center, the state section of the American Water Works Association, and the League of Nebraska Municipalities.

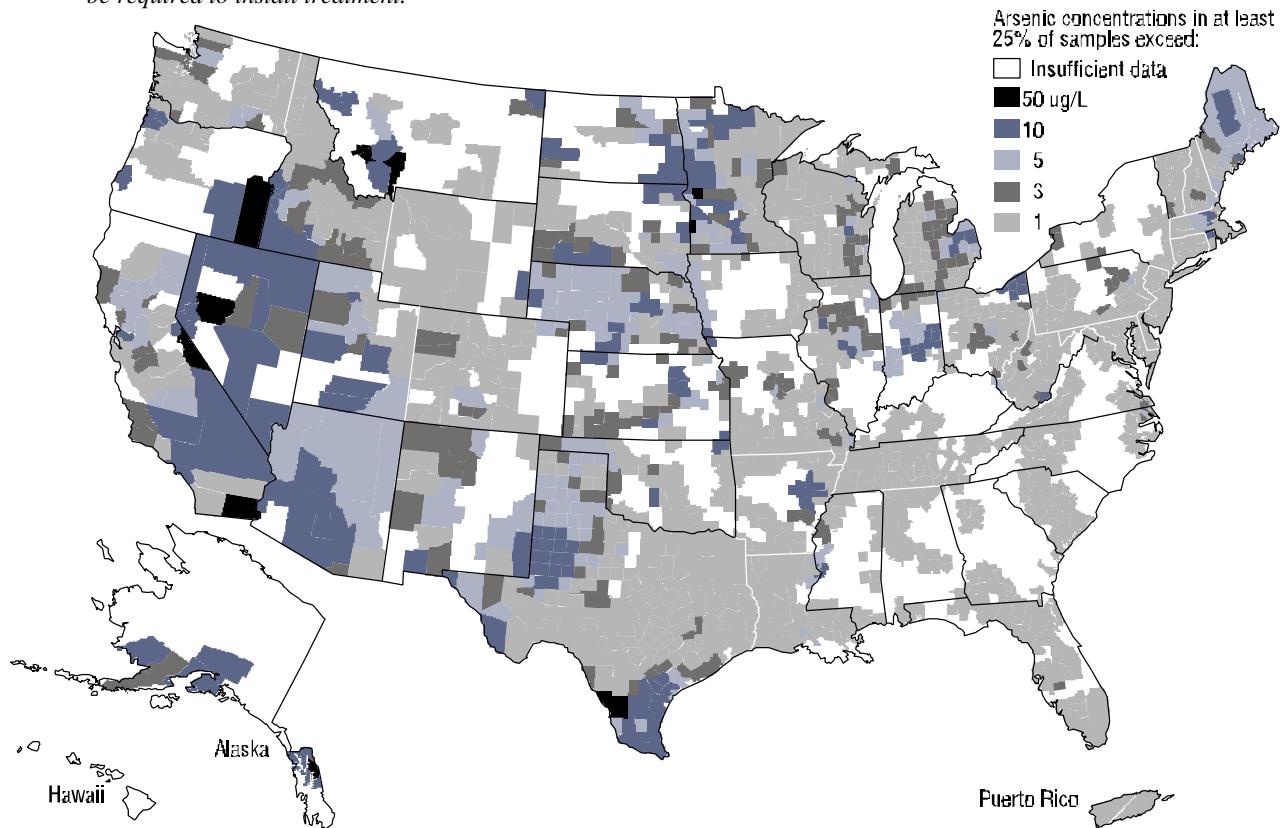
Arizona is among the states most heavily affected by the new rule: approximately 350 CWSs and NTNCWSs will need to take measures to comply. Reacting quickly, the state Department of Environmental Quality initiated a series of meetings in December 2001 toward an Arsenic Master Plan (AMP) that encompasses financing, technical assistance, and design.

continued on next page



Arsenic in U.S. Groundwater by County

This map, created by the U.S. Geological Survey, is based on 31,350 groundwater samples and shows arsenic concentrations found in at least 25 percent of samples in each county. The map gives a general idea of the distribution of wells testing high in arsenic, and shows that Nevada and Arizona are clearly affected by the 10 ppb standard. Even states like Nebraska, where only about 10 percent of water systems test above 10 ppb, may have significant numbers of systems that will be required to install treatment.



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“It’s a collaborative effort between our agency, other state agencies, local authorities, and private industry,” explains Jeff Stuck, manager of the DEQ’s Drinking Water Section. “We’re trying to leverage all of the resources that we have available to make compliance attainable for all systems.”

Stuck notes two of the many features of the AMP. First, “the workgroup will be creating an engineering design manual with specifications for generic equipment configurations and site layouts.” This will give water systems a “leg up” on the expensive design process. Then, building on the economies of scale, “if we can get a treatment facility that would be common to a lot of small water systems, we could develop a fee-for-service program where a number of systems would pay the department to contract operations and maintenance.” These measures could significantly reduce the cost of compliance statewide.

Arizona’s AMP workgroup is sending a

questionnaire to the state’s various technical assistance providers to better understand the services that each body provides. In each of these three states and nationwide, TA providers and state administrators are taking first steps toward arsenic compliance; some help will come from the EPA.

EPA to help water systems

The EPA pledged three kinds of help for water systems in its arsenic announcement last fall: training and technical assistance, assistance with funding, and research and development.

“We’re starting off with a series of training sessions, primarily focused on reaching the states and the technical assistance providers,” explains Peter Shanaghan, leader of EPA’s Drinking Water Utilities Team. “It’s a day and a half, and it’s intended to provide a very brief overview of the regulatory requirement and then a lot of emphasis on the technologies systems can use to achieve compliance.”

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Technologies currently available for small systems will be outlined in detail. “We expect that small systems will find that some type of adsorption technology, with media used on a throw-away basis, will be the most cost-effective approach. That will be something like activated alumina or one of the newer types of adsorptive media that are being developed,” says Shanaghan, noting that this type of system is the least expensive and simplest for small systems to use because there are no chemicals to handle.

“The other option that I think will be desirable,” Shanaghan adds, “will be the notion of centrally managed point-of-use technology.” The 1996 SDWA amendments allowed home-based point-of-use devices for compliance, as long as the water system owns and maintains them.

Two EPA publications will provide technological information to those who cannot attend the workshops. For small systems decision makers, Shanaghan’s team is preparing a simple workbook to guide them through the process of complying with the arsenic rule. For engineers and TA providers, there will be a design manual for state-of-the-art treatment technologies for small systems. These publications are scheduled to be available through EPA’s Web site by September.

Of course, assistance providers are interested in remediation technologies, but possibly even more interested in funding. “EPA has signed a memorandum of agreement with the [U.S. Department of Agriculture] Rural Utilities Service (RUS), specifically addressing arsenic rule implementation,” says Shanaghan. In the memorandum, RUS agrees to assist water systems by placing high priority on funding requests for projects required for arsenic remediation.

“We are mindful of the fact that this rule will affect a lot of people who previously have not had to seek funding,” Shanaghan continues, regarding the question of access to funds. “Anyone who would be eligible to receive funding from the RUS can receive assistance in filling out the applications.” States are also encouraged to use a portion of their DWSRF set-aside to help small systems apply for SRF funds.

But the biggest help with money may be time. “We’re really emphasizing the importance of exemptions as a tool for states to help systems come into compliance.” According to Shanaghan, systems of all sizes are eligible for a three-year exemption—to January 2009. Small, financially burdened systems may seek

extensions to 2011, 2013, and even 2015. “The practical implication is that it allows financial assistance providers to spread people out over time so everyone isn’t looking for DWSRF or RUS assistance within a couple of years.”

EPA funds research, development

Most of EPA’s resources with regard to arsenic remediation are devoted to two years of research and development. Sally Gutierrez at the agency’s National Risk Management Research Laboratory explains the four research elements undertaken in this first year. “One part of the research is the environmental technology verification program,” Gutierrez explains, “taking commercially ready technologies and putting them through short-term tests to gather performance data.” This program checks out vendors’ claims for their products and is focusing on adsorption technologies this year.

A second research element goes deeper, to “pair willing utilities with technology vendors for full-scale, long-term demonstrations of commercially available technologies,” says Gutierrez. Management by system operators in these trials will give data on reliability under real-world conditions.

The small business innovation research program will foster new technologies. “These are for technologies that will be proposed by small businesses around the country, and they are for feasibility studies at this point.” Gutierrez adds that promising technologies may be pursued in depth in the second year.

Finally, internal EPA research aims at greater understanding of fundamental issues. For example, EPA is researching the conditions under which iron in influent may be used to trap arsenic, eliminating the need for new technology. EPA is also seeking better certainty about the stability of waste media in the complex chemistry of landfills: better, cheaper ways of binding arsenic permanently mean less need for expensive hazardous waste disposal.

As EPA and other national groups address arsenic remediation at their conferences, much of the innovation, experimentation, and information-sharing that are needed will take place at the local and regional levels. A Nevada technologies conference will closely study ion exchange, and Nebraska’s TA providers will get a look at new ideas at a MAP-cosponsored alternative technologies conference. Through similar gatherings over the next decade, state regulators and TA providers will obtain the information small water systems need for arsenic compliance. ♦



Arsenic regulation, science, remediation resources available

by Pam Kasey
NETCSC Contributing Writer

The process of setting the new arsenic maximum contaminant level generated controversy like few other drinking water standards. The following resources offer information about health, policy, and treatment technology issues relating to the new standard.

U.S. Environmental Protection Agency (EPA): In preparation for proposing a new arsenic standard for drinking water, the EPA relied on expert panel review in three key areas: the National Academy of Sciences looked at health effects; the EPA's Science Advisory Board considered benefits of remediation; and the National Drinking Water Advisory Council calculated the costs of remediation. These reports and other rulemaking documents are available at the agency's arsenic Web pages located at www.epa.gov/safewater/arsenic.html. EPA's most recent pages on treatment technologies may be found at www.epa.gov/safewater/ars/treat.html and www.epa.gov/safewater/ars/trtmt.html. Documents also may be obtained by calling the agency's Safe Drinking Water hotline at (800) 426-4791.

Congressional Research Service (CRS): A branch of the Library of Congress, the CRS provides nonpartisan reports to the U.S. House and Senate. CRS's August 2001 report *Arsenic in Drinking Water: Recent Regulatory Developments and Issues* offers a detailed summary of the rulemaking history, the expert panel reviews, and arguments for and against a reduced arsenic standard. See the report at cnie.org/NLE/CRSreports/water/h2o-40.cfm.

Agency for Toxic Substances and Disease Registry (ATSDR): As an agency of the U.S. Department of Health and Human Services, ATSDR uses the latest science to gather information about the behavior of hazardous substances in the environment. The agency's detailed toxicological profile for arsenic may be obtained by calling (888) 422-8737 or by visiting www.atsdr.cdc.gov/toxpro2.html.

World Health Organization (WHO): Arsenic in drinking water has been recognized for decades as a source of serious public health problems in some parts of the world, particularly in Bangladesh. In 1993, the United Nations WHO established a provisional guideline of 10 parts per billion (ppb)—termed “provisional” because, although it was thought that human health would dictate a lower level, 10 ppb

represented the technological limit of detection at the time. The WHO's arsenic Web pages summarize some of the organization's activities in Bangladesh and worldwide. See www.who.int/water_sanitation_health/Arsenic/arsenic.htm for more information.

U.S. Geological Survey (USGS): One aspect of the National Water Quality Assessment, a program of the U.S. Department of Interior's USGS, is to look at trace elements in water across the nation. The USGS updated its maps of arsenic in groundwater in late 2001 to represent the best available data. See these maps and background information about data and mapping at webservice.cr.usgs.gov/trace/arsenic/.

Natural Resources Defense Council (NRDC): As part of its drinking water program, NRDC monitors implementation of the Safe Drinking Water Act and conducts research into specific contaminants. The council's February 2000 report *Arsenic and Old Laws* reviewed available drinking water data and urged EPA to expedite a stricter standard. NRDC's arsenic Web pages located at www.nrdc.org/water/drinking/qarsenic.asp offer detailed information for those interested in learning about the arsenic level in the water they drink; the 2000 report is available at www.nrdc.org/water/drinking/arsenic/aolinx.asp.

Scientists disagree: While Physicians for Social Responsibility supported a lower arsenic standard, the American Council on Science and Health saw no need for a lower standard. Review their arguments at www.psr.org/dwater.html and www.acsh.org/publications/reports/arsenic2002.html.

Association of State Drinking Water Administrators (ASDWA): Among those most directly impacted by the tighter regulation of arsenic in drinking water are the primacy state administrators who are called on to come up with programs and funding to support affected communities. ASDWA, representing a variety of state views, supported EPA's 10 ppb standard, while expressing concerns about the costs to small systems. The association urged EPA to look at the combined costs of all recent and upcoming drinking water regulation and suggested strongly that the existing Drinking Water State Revolving Loan Fund framework be used to direct additional funding assistance to systems in need. ASDWA's comments on the draft EPA arsenic rule may be downloaded from ASDWA's “Rules and Regs” page at www.asdwa.org. ❖

NETCSC "Associates" help small communities

by Jill A. Ross
E-train Editor

Six environmental training professionals recently agreed to be part of a team of experts that will increase the National Environmental Training Center for Small Communities' (NETCSC) ability to serve its customers. This team—known as "NETCSC Associates"—is a new NETCSC initiative to expand its expertise

and to broaden its geographic reach by having additional environmental training professionals available to help small communities.

As "Associates," these national experts will advise NETCSC on important training and technical issues as well as represent NETCSC as trainers and ambassadors. The team is already providing services that help NETCSC serve small communities, including helping NETCSC determine audience needs, recommending NETCSC resources to appropriate audiences, partnering with NETCSC to develop curricula and provide training, attending events and making presentations on behalf of NETCSC, and providing input for NETCSC's newsletter, products, and resources.

"Our new team of Associates serves to expand the capability, resources, and expertise that NETCSC already possesses," says John Hoornbeek, NETCSC director. "These individuals bring additional knowledge and technical depth to NETCSC and help to increase our geographic spread as we strive to assist the nation's small communities."

The combined expertise of the Associates team is impressive. Team members have expertise in small drinking water and wastewater systems; onsite wastewater treatment systems; solid waste; small utility

operations, finance, and management; and environmental training. This expertise complements the extensive capabilities in instructional design and curriculum development, training program management, environmental science, and environmental regulation that NETCSC already has on staff.

NETCSC's 2002 Associates team includes Gerald Doeksen, Ph.D., Jean Holloway, Christopher King, C.E.T., David Lenning, R.S., Lorene Lindsay, C.E.T., and Tommy Ricks.

Gerald Doeksen, Ph.D.

Gerald Doeksen, Ph.D., has devoted his 30-year career to garbage—that is to helping rural communities make informed decisions about how to deal with it. A regents professor and Extension economist with the Oklahoma Cooperative Extension Service in Stillwater, he helps communities develop budgets for all aspects of solid waste (i.e., landfills, transfer stations, recycling centers, collection systems, convenience centers) and estimate the costs and revenue of alternatives. He has also been involved in designing and promoting initiatives to reduce the waste stream, such as "Don't Bag It" and backyard composting programs.

Doeksen earned his doctoral degree in agricultural economics from Oklahoma State University. Working with the Cooperative Extension Service has allowed him to use his economics background to create budget studies for rural county and community leaders as well as to help many communities implement solid waste programs. He also has received numerous grants from the Oklahoma Department of Environmental Quality, the U.S. Department of Agriculture's Rural Development office, and the U.S. Environmental Protection Agency (EPA) to conduct surveys and budget studies, create educational materials and programs, and provide solid waste management training.

Doeksen has a long history with NETCSC, having served as a charter member of NETCSC's National Advisory Council. He was a primary author of NETCSC's curriculum, *Solid Waste Management Options for Local Officials*, and has helped create other NETCSC solid waste training materials. He has also conducted NETCSC workshops for local officials and environmental trainers.

"The Associates program makes professionals with years of experience available to help with training programs and other technical assistance," says Doeksen. "This will help NETCSC to reach and serve many more community leaders and trainees."



Gerald Doeksen, Ph.D.

Regents Professor and
Extension Economist

Stillwater, Oklahoma



Expertise : solid waste management, specializing in the economics of solid waste

"The tools I have developed enable decision makers to make more informed choices. I am glad to share my experience and research with others to help them evaluate their solid waste options."



Jean Holloway

Trainer

Newark, Maryland



Expertise : rate setting, financial planning, and management for small utilities

"The small municipality is our most basic unit of governance, and small towns are the ones doing the most with the least resources of any level of government. Every free or low-cost resource we can provide enhances their ability to continue doing just that."



Jean Holloway

A Maryland native, trainer Jean Holloway was born and raised in a small town and has spent her adult life working to help small communities. She served in various administrative capacities for the Maryland towns of Snow Hill, Federalsburg, Crisfield, Berlin, and Vienna. Then she joined the Maryland Rural Water Association where she was responsible for technical assistance and training programs offering onsite assistance to small community water systems throughout the state.

These experiences working with small communities taught Holloway “firsthand what it’s like to deal with an issue or problem and then find out there may have been a better way of dealing with it.” Today, as training manager for the Environmental Finance Center (EFC) at the University of Maryland, she helps small communities find the best way to deal with the problems associated with running a drinking water or wastewater treatment system. “My training audience knows up front that I’ve been where they are,” she says.

Through the EFC, Holloway teaches classes on water rates and rate design principles to small community and assistance provider audiences, as well as providing one-on-one technical assistance on utility rates, planning, and financial management for small communities. She helps communities in EPA Region 3, which consists of Delaware, Maryland, Pennsylvania, Virginia, Washington, D.C., and West Virginia.

Holloway is quite familiar with NETCSC and its customers, having partnered with the organization in the past to provide training on rate setting and cost recovery, capital improvements planning, and small drinking water system management. She is excited about her new role as a NETCSC Associate. “I think the Associates program will benefit small communities by broadening their training opportunities and giving them yet another resource that they may draw on for assistance with environmental problems and training,” says Holloway.

Christopher King, C.E.T.

Christopher King, C.E.T., has 20 years of experience in environmental education and training, having worked in water and wastewater operations, water quality research, hazardous materials, and environmental health and safety. Currently living and working in Missouri, King has helped a multitude of communities, both in the U.S. and abroad, to develop solutions to their water and wastewater problems.

Recognized as a certified environmental trainer by the National Environmental Training Association (NETA), King has served as the

director of the Center for Environmental Education and Training at the St. Louis University School of Public Health since 1997.

King has experience in curriculum development as well, having created training programs and curricula for the EPA and NETCSC. He was instrumental in revising the popular NETCSC training course, *Assessing Wastewater Options for Small Communities*. He has delivered this course to local officials and as a train-the-trainer workshop on many occasions and in many locations—at

NETCSC’s Environmental Training Institute in West Virginia and at training events in Virginia, North Carolina, and Washington State. Several years ago he and fellow NETCSC Associate, Lorene Lindsay, C.E.T., even took the course on the road presenting 16 one-day sessions to more than 350 local officials in all corners of Missouri. Most recently, King has developed and presented the course as a two-way interactive distance learning workshop.

Becoming a NETCSC Associate was a natural step for King. “This formalizes my relationship with NETCSC that has been developing for some time,” says King. “This relationship will help make more communities aware of

NETCSC resources and expand the expertise available to help meet the needs of small communities.”

David Lenning, R.S.

Should you ever need to know anything about onsite wastewater treatment systems, David Lenning, R.S., is one of the best people to ask. Lenning, active in the wastewater industry for more than 30 years, has a unique perspective as a result of experiences working in the private, public, and academic sectors.

Based in Washington State, Lenning is owner of Alternatives Northwest, an onsite wastewater *continued on page 16*

Christopher King, C.E.T .

Environmental Educator/Trainer

St. Louis, Missouri

Expertise : water and wastewater operations, water quality research, hazardous materials, environmental health and safety

“As Associates, we work with small communities on various issues, serving as ambassadors for NETCSC and informing officials about the resources available to them through NETCSC.”



David Lenning, R.S.

Onsite Wastewater Consultant/Educator

Shelton, Washington

Expertise : water and wastewater sanitation, specializing in onsite wastewater treatment issues

“I am happy to be part of a proactive program helping small communities, states, local government, organizations, and others interested in understanding more about onsite wastewater issues.”



NETCSC "Associates" help small communities

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consulting/education business that advises private and public organizations and firms about onsite wastewater treatment issues, including alternative systems, site evaluations, management programs, and training for all aspects of onsite wastewater treatment systems. He conducts training sessions throughout the state, region, and country, as well as teaches environmental health classes as an adjunct faculty

member of the University of Washington's School of Public Health and Community Medicine. In the past, he has served as director for the Northwest On-site Wastewater Training Center.

Lenning has worked with NETCSC and its sister organization, the National Small Flows Clearinghouse, on numerous occasions during his career, including serving as an instructor for NETCSC's onsite wastewater operation and maintenance course. He has actively supported the

development of state onsite wastewater training centers and, working with NETCSC, has been instrumental in planning and presenting several national "academies" to promote the development of onsite wastewater training centers in North America.

"We still have misperceptions of what onsite wastewater systems can do and how to best care for them. Our society needs as many realistic and reliable options as possible to handle wastewater," notes Lenning. "NETCSC— together with its sister agencies—can, should, and does play a vital role in getting the proper messages across to all the appropriate players,

including the general public."

Lorene Lindsay, C.E.T.

Lorene Lindsay, C.E.T., has been teaching people about water and wastewater for 23

years. She has extensive experience working with both large and small municipal drinking water and wastewater systems, including onsite wastewater treatment systems. A NETA certified environmental trainer, she draws on her vast hands-on experience to develop curricula and deliver training to college students, environmental professionals, assistance providers, and municipal officials.

Based in Raytown, Missouri, Lindsay is president of Silver Springs Environmental Services, Inc., where she conducts training for local, state, and federal agencies and organizations and provides environmental consulting services to clients. In the past, she served as vice president of Miller/Lindsay, an engineering firm specializing in small and onsite wastewater treatment system design and operation and providing water and wastewater testing for small systems. Lindsay also has served as executive administrator of the Missouri Water Environment Association and director of the Environmental Resource Center at Crowder College in Neosho, Missouri.

Lindsay has generously shared her expertise and ideas with NETCSC since the organization was first established in 1991. She served on NETCSC's first National Advisory Council, helping to launch the program as the country's central resource for assisting small communities with environmental training. Since then she has assisted NETCSC in the development and delivery of a number of training programs.

"I am glad to be on board," says Lindsay. "The Associates program allows me the opportunity to promote the services of NETCSC as well as find new partnerships for training. I believe the program will help small communities develop more training programs and make better use of the curricula that NETCSC has developed."

Tommy Ricks

Tommy Ricks has been working with community water systems for 13 years—first as an operator and business manager for a small water utility in Mississippi and later as a technical assistance provider. Based in Crystal Springs, Ricks assists water systems throughout Mississippi as an operations/management specialist for Community Resource Group, the southern affiliate of the Rural Community Assistance Program.

As a technical assistance provider, Ricks has helped many small and very small water systems find solutions to their financial, managerial, and technical problems. He has

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Lorene Lindsay, C.E.T.

Private Consultant/
Environmental Trainer

Raytown, Missouri



Expertise : drinking water and wastewater treatment, curriculum development and delivery

"Small communities are especially in need of the types of resources provided through NETCSC. The Associates program is an opportunity to promote training and information transfer."



Tommy Ricks

Management Specialist/
Environmental Trainer

Crystal Springs, Mississippi



Expertise : financial, managerial, and technical issues facing small utilities

"I am excited about formalizing my relationship with NETCSC and the enhanced services that I will be able to provide to small communities."



Training Skills:

Using case studies in environmental training

by Jill A. Ross
E-train Editor

Most educators agree that adults learn best when they are actively involved in the learning process. One effective way to involve adult learners is to incorporate case studies into training activities. Case studies allow adult learners the opportunity to participate in “real life” experiences while in the classroom. *E-train* recently interviewed three expert trainers who explained the benefits of using case studies in environmental training and offered advice on how to use them.

Why should trainers use case studies in environmental training?

“Case studies offer environmental educators and their learners an opportunity to study theories, concepts, and other abstract elements in a ‘real world’ setting without the dangers of applying those abstract compilations in an untested scenario,” says Gary Wingenbach, Ph.D., assistant professor of agricultural journalism and communications at Texas A&M University. Wingenbach has more than 16 years experience as an adult educator and trainer specializing in agriculture and natural resource related training issues.

“In other words, trainers and trainees get an opportunity to learn from other peoples’ mistakes,” continues Wingenbach. “It’s using the old ‘trial-and-error’ learning method, but with the ‘error’ portion systematically removed from the learning environment.”

Case studies can be useful for illustrating and better defining a presentation topic, notes Tommy Ricks, an environmental trainer with Community Resource Group. Ricks has extensive experience training local officials about capacity development issues. “Case studies help bridge the gap between academic terminology and ‘real life’ circumstances,” he says.

According to Ricks, case studies can be used as meaningful practical exercises that can stimulate participants’ critical thinking skills. “Adult learners need to be engaged and challenged. Trainers can create a multi-faceted dynamic training experience that adult learners can appreciate by incorporating case studies into their environmental training program,” says Ricks.

Christopher King, C.E.T., director of the Center for Environmental Education and Training at the St. Louis University School of Public Health, regularly uses case studies in his work with environmental professionals, community leaders, and technical assistance providers.

“A good case study can be used to help students achieve any level of learning—be it knowledge, application, comprehension, or problem solving,” says King.

How can trainers work case studies into their existing training?

Trainers who rely on a lecture-style format need to let go of their concern that students will miss out on content by taking the time to use case studies, advises King. “It is very easy to prioritize all of the information that you want to pass along to your students, but it’s important to remember that your students are likely to learn more if you create a learning situation they are involved in,” he says.

King likes to use case studies early in his presentation to establish the idea that the training will be relevant and will have real world application. “Adults will invest themselves in the training program more if they believe the training will be relevant to them,” says King.

Wingenbach sees case studies as a perfect opportunity to use the small group training technique. Trainers can present the broad concept or theory to the classroom, ask the large group if they understand the concept, and then break the large group into smaller groups. The trainer then provides each small group with a case study related to the large group presentation and encourages participation by using the case study to initiate discussion.

Ricks uses case studies in both his audio-visual presentations and participant handouts to illustrate or emphasize particular training topics. He also uses them as practical exercises. “I give the participants case study background information and then allow them to work individually or in small groups to solve the problems contained in the case studies,” says Ricks.

Where can trainers find case studies?

Trainers may be interested in using case studies, but they may wonder where they can go to find scenarios relevant to their training topics. According to King, technical assistance providers who work with small communities on a day-to-day basis are an excellent source of information for environmental case studies.

Ricks suggests building a cache of case studies by interviewing technical assistance providers, consultants, and primacy agency field engineers who assist communities with their environmental systems. “Keep in mind how the case study will relate to the training topic when selecting

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Training Skills: **Using case studies in environmental training**

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scenarios and interviewing experts,” says Ricks.

Wingenbach recommends using the Internet to search for “ready-made” case studies by exploring zoning laws and environmental conditions of a situation or community. He also suggests contacting the local media or county courthouse for case study leads.

Should trainers use “real life” or hypothetical case studies?

Trainers can use either “real life” case studies or create hypothetical case studies to illustrate the necessary concepts. King says both methods can work well, depending upon the needs of the training. “Real life situations, of course, have credibility on their side, so they may be more convincing, but they may lack characteristics necessary to meet all of your learning objectives,” says King. “Hypothetical case studies can be developed—sometimes by embellishing a real case study—to include all the points that you want to address in your training.”

Wingenbach finds that hypothetical case studies are easy to create. He sets the stage with a brief description of the characters and the situation and provides enough detail to discuss the case, but not enough to solve it. “The trainees should be encouraged to think creatively about the situation, seek solutions—if necessary, and predict the case study outcome,” he says.

Drawing on his experience working with small communities, Ricks feels he has enough “real life” scenarios that he can use or convert for his training purposes. “However, it is very important to be sensitive by assigning fictional names to all case studies,” he says. “Because participants generally appreciate ‘real life’ case studies, trainers need to emphasize that the case studies are borrowed from actual situations.”

Are there any pitfalls trainers need to be aware of when using case studies?

Case studies can be an excellent training technique, but trainers need to be aware of potential pitfalls when incorporating them into training programs.

“When using case studies, be sure you give clear instructions to the students so they know precisely what you expect of them,” recommends King. “Next, monitor their progress so you can intervene if necessary. If students become confused, frustrated, or bored with what they are doing, the instructor needs to intervene in some manner to keep things moving.” He also points out it is important to bring closure to the case study. “You need to be certain the students have

grasped the proper concepts,” he says.

Wingenbach warns that small groups can stray off the task of studying their case. “Prepare small groups by letting them know you will ask them to report their case study findings back to the larger group,” he notes. “This technique effectively transfers the responsibility of learning to the trainees, which is an important function of successful adult education.”

Ricks emphasizes that trainers need to stay focused when using case studies—both in pre-training development as well as the execution of the case studies. “If a trainer has personal knowledge or experience with a real-life situation that is being used, the trainer should resist the temptation to be overly dramatic or to elaborate too long in the presentation,” notes Ricks.

It is also important not to overuse case studies. “Trainers should realize that case studies are only one component of a multi-faceted training program and they should complement and supplement the training curriculum,” says Ricks.


What advice do you have for trainers who want to use case studies?

All three experts agreed that trainers must establish their course objectives and then determine whether case studies can be used to help achieve them.

“Case studies must have relevance to the larger topic you are attempting to teach. If the case is not related to your topic, don’t use it!” says Wingenbach. He also recommends not calling it a “case study” but rather a “scenario.” “This doesn’t put an academic distance between the trainer and the trainees,” he says.

Understanding your target audience is critical when planning to use case studies, notes Ricks. “The degree of complexity of background information contained in the case study depends largely on the target audience and their ability to easily understand this information,” he says.

Ricks advises that there are also logistical considerations that trainers must be aware of when using case studies as a practical exercise. How much time will need to be allotted for the exercise? Will additional facilitators need to be present to assist with the exercise? Will audio-visual equipment or other supplies be needed?

King says it is important to provide plenty of time for a case study. “When case studies work well, they work really well, and you will want to keep that going,” he says. “But be sure to have a plan ‘B.’ If you find things getting bogged down for some reason, wrap it up and move on. Be flexible and have fun!” 

trainingresources

Editor's Note: The following products are available from the National Environmental Training Center for Small Communities (NETCSC). To order, write to NETCSC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064; call (800) 624-8301 or (304) 293-4191; fax (304) 293-3161; or e-mail netc_orders@mail.nesc.wvu.edu.

Managing a Small Drinking Water System: Financial Management

Developed by the National Environmental Training Center for Small Communities

This training module will help local officials understand that a drinking water system is a business that should pay for itself. It also will help local officials understand sound financial management practices, the importance of using these practices, and the benefits of hiring/securing expert financial assistance. Topics covered include: recordkeeping and bookkeeping, developing a master business plan and utility budget, basic principles in setting rates, a brief description of accounting models and why they matter in setting rates, steps for evaluating rates, recovering the cost of providing water, building customer support for rate increases, special rates, and the annual audit.

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This training module will help local officials understand the importance of, and the components of, a good business plan. It will help local officials understand the issue of restructuring, different types of management structures, and the advantages and disadvantages of each. Topics covered include: an overview of capacity development; maintaining managerial capacity; business plans for managing a drinking water system; introduction to planning; working as a team; common drinking water system management structures; examples of partnership opportunities; regionalization, consolidation, and privatization; and issues to consider when restructuring.

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This training module will help local officials understand issues related to hiring, maintaining, and working effectively with staff and operators. Topics covered include: staffing and organization, the hiring process, staffing issues unique to small communities, working with the operator, working with employees, management training, and management skills.

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Developed by the Center for Training, Research, and Education for Environmental Occupations and the National Environmental Training Center for Small Communities

This 11" by 17" poster provides possible solutions to common wastewater treatment problems associated with rotating biological contactor operations. Using a table format, the poster lists observations that indicate treatment problems, probable causes, what to check or monitor, and possible solutions. This poster may be used with the training curriculum, *Troubleshooting and Optimizing Wastewater Treatment Systems—Attached Growth*.

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Developed by the Center for Training, Research, and Education for Environmental Occupations and the National Environmental Training Center for Small Communities

This 22" by 17" poster provides possible solutions to common wastewater treatment problems associated with trickling filters. Using a table format, the poster lists observations, probable causes, what to check or monitor, and possible solutions. This poster may be used with the training curriculum, *Troubleshooting and Optimizing Wastewater Treatment Systems—Attached Growth*.

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NETCSC "Associates" help small communities

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delivered training to hundreds of decision makers for water systems in Mississippi and other areas of the country. He was also instrumental in developing the state's certified water board management training program.

Ricks has shared his expertise with NETCSC on many occasions. He has delivered training to local decision makers and technical assistance providers at NETCSC's annual Environmental Training Institute and is currently helping to develop NETCSC's new security training module. Ricks also is training small system board members throughout Mississippi using NETCSC's *Managing a Small Drinking Water System* curriculum.

Ricks is pleased to be part of NETCSC's team of Associates. "I believe that my continued relationship with NETCSC will benefit small communities both in Mississippi and in other areas of the country," comments Ricks. "I have already enjoyed the support and expertise that the NETCSC staff offers to environmental trainers, and I know this support will grow even more."

For further information about any of NETCSC's Associates or for more information about how NETCSC staff and Associates can assist small communities, please contact Randall Levelle, NETCSC assistant director, at (800) 624-8301 or (304) 293-4191, extension 5539, or rlevelle@wvu.edu.

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