Drinking Water News For America's Small Communities

On Tap

Summer 1995
Volume 4, Issue 3

Cynthia Dougherty Talks About the SDWA

by Harriet Emerson
On Tap *Editor*

WASHINGTON, D.C.—It's muggy by 8 a.m. on Bastille Day 1995. FM radio plays the French national anthem in celebration as the temperature climbs toward 98 degrees. Despite heat advisories, dedicated joggers pant through the thick air.

On the twelfth floor of the U.S. Environmental Protection Agency (EPA) Building, the director of the Office of Ground Water and Drinking Water looks worried. This is no day of celebration for Cynthia Dougherty. The EPA is under siege. Every answer today has to be punctuated with "if we have the funds; if we still have people . . . ."

The July 14 headline on *The Washington Post's* Federal Page read: "House Panel Signals Assault on EPA Initiatives." A House Appropriations Subcommittee opened the assault this week by recommending a 30 percent cut in the EPA's 1996 budget, reducing it to $4.87 billion, down $2.4 billion from 1995, the article stated. And there were some mighty restrictive riders to these proposals. Subcommittee chair Rep. Jerry Lewis (R-CA) said the cuts and riders are necessary to force the EPA to reconsider the administrative direction it is taking. Environmental advocates say Republicans are trying to roll back environmental protection 20 years.

By the end of July, the *Wall Street Journal* reported that 51 House Republicans broke ranks and helped Democrats strip 17 riders—the ones geared to slow enforcement of clean air and water standards—from the EPA funding bill. According

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Help us improve by filling out the On Tap *and NDWC Survey Insert Inside*

Slow Sand Filter Serves Dover a Cool Drink

by Kathy Jesperson
NDWC Staff Writer

After six years of boiling their drinking water, 1991 is a year that Dover, Idaho, residents won't soon forget. That's when the community completed the installation of its new $762,800 water system, which includes a slow sand filter, 79,000-gallon reservoir, river intake, and distribution system.

"The treatment plant was needed for years," says Steve Tanner, Drinking Water Program manager, Idaho Division of Environmental Quality (DEQ). "Dover's water system was one of the most decrepit in Idaho and a real health threat to the residents."

The beautiful rural scenery of northern Idaho surrounds the community of Dover. The city installed a slow sand filter to control its drinking water problems.

According to Tanner, Dover's drinking water problems really began about 15 years before the installation of the new system, with residents reporting system leaks and low water pressure. It wasn't until the mid 1980s, however, that the DEQ "determined the water was not reliably safe to drink and violated several state drinking water regulations."

Contamination Concerns DEQ

The old system drew water from the Pend Oreille River about one mile downstream from Sandpoint, Idaho's, sewage treatment plant, says Tanner. And the Dover system had no means for removing *Giardia*. Besides the lack of any filtration

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On Tap *Staff Visits EPA, Surveys Readers*

It has been a hot dry summer in the East. As water wealthy as West Virginia is, by August and September, many wells run dry. Other parts of the country got more rain than they know what to do with. At the National Drinking Water Clearinghouse (NDWC), we're trying to figure out what information on small drinking water systems will be most helpful to all of you, whether you live where it's wet or dry.

NDWC Program Coordinator Sanjay Saxena and I left West Virginia's rural mountains behind in mid-July to interview Cynthia Dougherty, U.S. Environmental Protection Agency (EPA) director of the Office of Ground Water and Drinking Water in Washington, D.C. We discussed small systems—viability, exemptions, technical assistance—and stakeholder meetings. (See front page feature.) Then I spoke with Saxena about the EPA stakeholder meetings for small system capacity building that he attended in the spring. (See page 4.)

Staff Writer Kathy Jesperson talked with folks in Dover, Idaho, about their new slow sand filter system—how they designed and installed it, and how long they had to boil their water before the system went in. (See front page feature.) Jesperson also gives an overview of filters. (See pages 12-13.) Staff Writer P.J. Cameon spoke with a few of our neighbors to the north about the possibility of Canada instituting drinking water regulations. (Page 6).

Since it's back-to-school time, we've included articles about a number of educational programs: Water Education for Teachers (Page 7), the Illinois Middle School Groundwater Project (Pages 8-9), and the Global Rivers Environmental Education Network (Page 9)—all good sources of information. Many find that the earlier we educate our children, the more likely they are to form life-long habits, such as valuing the environment and conserving natural resources. And anyone with kids will tell you that they are very good at influencing their parents.

This issue includes an *On Tap* and NDWC Survey. We hope you'll take a few minutes to fill it out and return it to us. We want to hear from you. NDWC's technical staff—the people you talk with when you call us with a question—have added a few questions about NDWC services to our readership survey. Have you called our 800 number with questions or products orders? We want to know what information is helpful, which subjects you want to know more about, how we can improve *On Tap*, and how the NDWC can serve you better.

There's nothing like a cool drink of water on a hot summer day. Allison Hoornbeek, 2, left, and Sue Priya Saxena, 3, pour each other tall sparkling glasses full. The two girls are children of Environmental Services and Training Division staff.

The response to our groundwater issue and especially to the "Groundwater Protection Begins at Home" poster has been fantastic. Posters are still available if you wish to order extra. As always, *On Tap* is brimming with resources. (See pages 18-20.)

In early August, Jesperson and Technical Assistant Arjita Sharma braved the hairpin turns of southern West Virginia to tour water plants with Larry Rader, West Virginia Rural Water Association program specialist. Look for information from that trip in an upcoming operator issue.

Harriet Emerson
On Tap Editor

Wrong Number Listed

We apologize for an error in the last *On Tap*. We edit very carefully; however, sometimes a typo slips through. In this case, the Farm*A*Syst program (pages 4–5, Spring 1995 *On Tap*) bore an incorrect area code. A patient private citizen in New Jersey has fielded a considerable number of Farm*A*Syst calls. We thank her for accepting our mistake with grace, and apologize to her and to any of you unable to reach Farm*A*Syst. Their correct area code and number is: (608) 262-0024.

NDWC Makes Bibliographic Searches Easy

Looking for drinking water resources but find library databases overwhelming or confusing? Or maybe you don't have time to search the library yourself. Then the National Drinking Water Clearinghouse's (NDWC) bibliographic database may be the literature source you're looking for.

Offering a variety of drinking water information sources, the database contains more than 500 article abstracts on such topics as wellhead protection, drinking water regulations, water conservation, treatment technology, and operation and maintenance. And "it doesn't take long to obtain a search," says Arjita Sharma, NDWC technical assistant.

Sharma says she can quickly provide a caller with literature sources, including such information as journal titles, volume numbers, author names, article titles, and an abstract—which helps you decide if the article is really what you need. And once a search is made, the results are mailed directly to you, making your literature research a much simpler project.

For more information or to obtain a literature search, call the NDWC at (800) 624-8301.

LINKS Offers Small-Town Network

Environmental LINKS (Local Government Information Networks) helps local governments of towns with populations of 10,000 or less understand and participate in the development of federal environmental regulations. The program distributes federal regulatory information, and assists small communities with strategic planning and exploration of financing alternatives.

Environmental LINKS also helps foster and maintain cooperative regional partnerships. They provide a quarterly newsletter, an online communications bulletin, publications and case studies, regional forums, and a small town clearinghouse.

Originally called the Small Town Environmental Partnerships (STEP) program, The International City/County Management Association (ICMA) changed the name to LINKS in April to avoid being confused with The Rensselaerville Institute's Small Towns Environment Program, also known as STEP. Rensselaerville's STEP program helps small communities with minimal funds find innovative solutions to water and wastewater problems. (See article on page 19.)

Environmental LINKS is funded by the U.S. Environmental Protection Agency's Office of Regional and State/Local Relations.

For more information on Environmental LINKS, contact Shannon Flanagan at (202) 962-3540, or write to ICMA, 777 North Capitol St., NE, Suite 500, Washington, DC 20002-4201.

RUS Loan Interest Rates Change This Quarter

Interest rates for water and waste disposal loans offered by the Rural Utilities Service (RUS) changed slightly for the fourth quarter of Fiscal Year 1995.

Rates are set quarterly at three different levels, which have specific qualification requirements. The new rates, in effect from July 1 through September 30, 1995, are:

- *poverty line* rate: 4.500 percent (unchanged from last quarter);
- *intermediate* rate: 5.125 percent (down .125 percent from last quarter);
- *market* rate: 5.750 percent (down .250 percent from last quarter).

RUS loans are administered through local or state Rural Economic and Community Development (RECD) offices, formerly known as Farmers Home Administration offices. Local RECD offices can provide specific loan and application information.

For the number of your state RECD office, call the National Drinking Water Clearinghouse at (800) 624-8301.

EPA Stakeholder Meetings: What's the story?

by Harriet Emerson
On Tap Editor

The U.S. Environmental Protection Agency (EPA) has been hosting "stakeholder meetings" all spring—a series of meetings in eight areas of interest to the drinking water community. What are these stakeholder meetings all about?

In very broad terms, stakeholders are groups, industries, communities, and individuals affected by or interested in EPA activities, stated Sarah Layton in the June 1995 APWA Reporter. Thus, individuals and industrial and program representatives who have a stake in EPA decisions were invited to Washington, D.C., to comment on their areas of expertise.

There were two major stakeholder meetings devoted to small systems capacity building. The first, on March 29, sought input on monitoring reform, viability and restructuring, technology, and training. The second meeting focused on viability and restructuring. Peter Shanaghan, EPA Small Systems Coordinator, organized the meetings and was assisted by a professional facilitator.

Separate stakeholder meetings were also held to gain additional input regarding the monitoring reform and technology issue. The scope of these meetings was not limited to small systems. Technology and monitoring reform are major issues that affect larger systems as well. EPA senior managers are reviewing and evaluating input received from stakeholders and are considering options for program redirection based on this input.

Sanjay Saxena, program coordinator for the National Drinking Water Clearinghouse (NDWC), was invited to attend several stakeholder meetings. Since the NDWC provides information and technical assistance to small systems, the NDWC has a stake in EPA decisions. Saxena attended both small system capacity building meetings as well as the standard setting group. The primary intent of the latter was to determine priorities for standard setting.

The small system viability and restructuring meeting was composed of a mix of organization directors, operators, and other "task performers," Saxena said. "There was a good representation of various concern groups."

When he welcomed participants, Shanaghan noted that the meeting was part of an "ongoing process of collaborative problem solving." The purpose, he said, was to get opinions from individuals who hold a stake in the process.

Saxena said that approximately two dozen people attended. "There were phone hookups for people who could not attend," he said, explaining that, of course, cost was prohibitive for some people—particularly those from the western states—to fly into Washington for a day or half-day meeting. Indeed, another dozen participated by conference call, including representatives from five EPA regions and mayors and city officials from two towns in Oregon.

"Many systems are subsidized to the point that they cannot afford to run the systems which have been built for them," one contributor said. "Most systems are run by towns or villages which are making decisions to spend large amounts of money without a full understanding of the project under consideration. This is exacerbated by rapid turnover in local leadership and the lack of any system to review for such decisions . . .," said another.

"From the time many of these systems were created with federal money they were under-capitalized," said George Zoto, Massachusetts Department of Environmental Protection.

"Debt repayment is not the principal cause of nonviability," said Jake Blair, Maryland Center for Environmental Training, representing the Rural Community Assistance Program. "Less than two percent of systems go into receivership. The principle cause is nonviability of the community itself—rural communities experiencing out-migration and losing their tax base."

Vanessa Leiby, Association of State Drinking Water Administrators (ASDWA), said there are ideas for addressing new systems and their regulation, "but what about existing systems which were put in under the old rules when there was little or no regulation? Changes in the regulatory framework are forcing these existing systems to become businesses. We have to make sure we don't recreate a situation in regulating these old systems that pushes people back into [using] `individual wells. We don't want to run these old systems out of business with regulation."

In summary, among the issues and challenges small system participants identified were: lack of long-range planning, operating capital deficit, lack of managerial capability or oversight, the federal government helping to capitalize many systems but providing no ongoing financial support for operations and maintenance, best available technology requirements, role of local planning and local government, age of some systems, contaminants—particularly microbial—cost of monitoring, use of large-system standards, and means for assessing viability.

"The need for assistance to small systems was pointed out very strongly—the need to provide

Continued on next page

Water Fact

Three quarters of the weight of a living tree is water.

—America's Clean Water Foundation

It Takes Partners To End Water Pollution

New partnerships, not new technology, are the answer to ending water pollution. This was the consensus reached by experts at the American Water Works Association's (AWWA) Source Water Protection teleconference, according to an AWWA press release.

The AWWA teleconference, held in early August, was downlinked to 140 sites across the U.S. and Canada to an audience of more than 5,000. Discussions centered on methods of protecting drinking water sources from contamination.

Jack Hoffbuhr, AWWA deputy executive director, called source water protection "the first barrier in the multiple barrier approach to protecting consumers from water contamination."

Dr. Daniel Okun, professor emeritus of environmental engineering from the University of North Carolina, said "a major gap is that there are no regulations for watershed protection." Okun reported that North Carolina has passed innovative legislation requiring all local authorities with jurisdiction over water supplies to send land use plans to the state for approval.

Douglas Hall, environmental protection manager for Dayton, Ohio, explained how Dayton formed a partnership between elected officials, administrators, planning commissions and the local U.S. Air Force base. The partners agreed to regulate hazardous materials near wells.

The Dayton water protection program, partially funded by water customers, also uses economic incentives to encourage "groundwater-friendly" businesses to settle in their area.

Susan Seacrest, president of the Groundwater Foundation, talked about the Groundwater Guardian Program, a voluntary partnership where groundwater protection is accomplished by community teams from local government, citizens groups, educational institutions, business, and agriculture. (See cover story, *On Tap*, Spring, 1995.)

Despite efforts, some communities are unable to protect their drinking water source. And clean up can carry a hefty price tag. Jack DeMarco, superintendent of Water Quality and Treatment, Cincinnati Water Works, explained Cincinnati's "elaborate water monitoring program on the Ohio River."

The Ohio River is rimmed with industries that use the water, so Cincinatti's best option was to build the largest Granular Activated Carbon plant in the world—at a cost of approximately $60 million. It cleans water at an added cost of $20 per family, per year.

"Protection is cheaper than remediation," commented Davis Jennings of the Washington State Department of Health.

The AWWA, an educational organization for water professionals, is dedicated to improvements in science, technology management, and communication concerning public drinking water issues.

For further information on the American Water Works Association, call (303) 749-7711, or write them at AWWA, 6666 West Quincy Ave., Denver, CO 80235.

EPA Stakeholder Meetings: What's the story?

Continued from previous page

assistance to systems so they can operate under compliance," Saxena said.

Another section of the small system meeting centered on viability and restructuring. What do these terms mean to stakeholders, and would another term be easier to explain and understand?

Diane Kiesling, a public utilities commissioner from Florida, indicated that viability is a fine term, but that another term is needed for non-viable. Dave Sieburg, Washington Public Utilities District, suggested that viability can be best explained by putting it in the larger context of sustainable communities.

"This is a tough issue," said Bridget O'Grady, ASDWA. "No matter what you call it, it's still a tough issue. It may be more confusing to change the terminology where you're still talking about the same thing."

Shanaghan then defined the term restructuring as referring to a broad range of options, and basically, he said, it covers everything that a system can do to make itself more viable. Most meeting participants agreed that restructuring was a good umbrella term.

Stakeholders made the following suggestions in which EPA can assist or direct efforts toward viability and restructuring: develop a pilot program demonstrating restructuring, give systems computer capability and training, develop a model program, provide incentives, and give information and examples to local governments. Discussions followed on the roles of state programs, local governments and systems, and federal programs.

For information on small drinking water systems, call (800) 624-8301.

Canada Considers Drinking Water Safety Act

by P.J. Cameon
NDWC Staff Writer

Canadian officials are considering a Drinking Water Safety Act, which would allow its government to adopt national regulations pertaining to certain aspects of drinking water quality.

Each Canadian province adopts its own drinking water standards, based on federal government guidelines. Passage of the act would allow the federal government to regulate some drinking water issues directly.

For instance, federal government officials are interested in regulating water treatment units, or "point-of-use" (POU) devices, sold for home use. The regulations would combat what Canadian officials say are unwarranted claims by some companies selling these devices.

"We want to ensure that what the public is being told they are getting is what they are actually getting," said David Green, senior engineering consultant with Health Canada, the federal agency considering this action. He said Canadian officials have had a continual problem with health claims associated with treatment devices.

Green said the problems are not normally with major manufacturers, but instead with less-reputable companies that make grand claims about the alleged health benefits of their products, when those products treat only aesthetic problems with the water.

These devices are used in individual residences to purify private well water or municipally supplied water. They may treat all the water entering a residence (point of entry) or just the water flowing from a single faucet (POU). The legislation might also include point of dispense devices, which include drinking water vending machines in stores.

In 1993, Canadians spent $700 million on the more than 450 models of home treatment devices sold in Canada, according to Green. He added that sales have continued to increase.

If the Canadian Parliament adopts the legislation, regulations could then require that models sold in Canada meet certification standards set by a third party, such as the National Sanitation Foundation (NSF) International, formerly National Sanitation Foundation. Green said roughly 30 percent of the models sold in North America already meet NSF standards.

Any federal action would also ensure that proper maintenance instructions are provided to consumers who buy treatment devices. "Some devices that are OK when they are installed can cause illness if they are not properly operated or maintained," Green said.

The proposed action would cover treatment devices claimed to limit biological and chemical contaminants in water. It would not address claims of aesthetic improvements to water taste or odor.

Additionally, drinking water treatment additives and system components would be regulated. This effort is designed to ensure that community water systems, especially in small communities, are using chemicals and materials appropriate for drinking water.

The U.S. federal government does not currently regulate drinking water POU devices, according to the U.S. Environmental Protection Agency (EPA). But it does require that manufacturers register—with the EPA—any treatment device that contains a pesticide to prevent bacteria buildup.

This EPA registration is designed to show that the pesticide used does not harm human health, according to the agency. However, EPA registration does not imply that the device meets its advertised claims.

Several states—including California, Iowa, Wisconsin, and Massachusetts—have some form of regulations for drinking water POU devices.

Herbicides Taint Midwest's Water

Middle America's drinking water may contain herbicide levels far greater than federal standards dictate, according to an August 18, 1995, *Washington Post* article.

The Environmental Working Group, a nonprofit research organization, collected tap water samples in 29 communities in the Midwest and South from mid-May to July—the peak growing season. Water samples showed the presence of at least one weed killer in all but one city: Memphis, Tennessee, where the water comes from deep wells.

The research focused on the two most common herbicides—atrazine and cyanazine—used to control broadleaf weeds on corn and sorghum crops. However, drinking water samples indicated the presence of up to nine weed killers in a single glass of midwestern water.

While chemical industry and water system officials say these findings do not necessarily mean the water is not safe to drink, U.S. Environmental Protection Agency (EPA) assistant administrator for pesticides, Lynn R. Goldman, said that health risks should always be considered, especially for children.

Both atrazine and cyanazine are suspected carcinogens, and have been linked to cancer in animals. The study indicated that atrazine exceeded federal standards in 14 study communities, while cyanazine levels were too high at least once in 18 communities.

Project WET Educates Teachers

Students Learn about Groundwater

by Jennie Lane
Curriculum Development and Research Coordinator
Water Education for Teachers

The classroom suddenly becomes quiet as students match their "well logs" to those made by other students. They are constructing their own geologic cross-section of a groundwater system.

Like piecing together a puzzle, a picture forms. The noise level increases to an excited buzz as students make discoveries.

"Look what happens to the water table!" exclaims one student. "I thought the water in my shallow well would be clean," says another, "but now that I see a landfill is nearby, I'm not so sure."

Workshop Uses Hands–on Learning

Are these revelations taking place in a high-tech research lab? No, these students are in an ordinary classroom—ordinary except that their teacher has attended a Project WET (Water Education for Teachers) workshop, and is using a creative, hands-on activity called "Get the Groundwater Picture."

Project WET is an interdisciplinary, nonprofit water education program. The project's goal is to promote the awareness, appreciation, knowledge, and stewardship of water resources. It is based at Montana State University in Bozeman, Montana.

Since its formation in 1984, Project WET has mushroomed into a national and international leader in water-based science and environmental education. It is endorsed by a growing network of educators around the country who actively participate in the design, development, and dissemination of educational products.

Guide Overflows with Activities

The *Project WET Curriculum and Activity Guide* is a cornerstone of the program. The guide, designed for grades K–12, is a collection of innovative, interdisciplinary, water-related activities that supplement teachers' curricula. In "The Pucker Effect," students locate a hidden source of groundwater contamination by digging "test wells." Powdered lemonade drink mix is buried in a pan of sand and students measure the pH of samples to locate the "contamination" site.

The Project WET Curriculum and Activity Guide will be distributed nationally through WETnet, Project WET's network, to teachers at the grassroots level who participate in Project WET teacher education workshops. Peer-nominated educators from all 50 states, the District of Colombia, and the U.S. territories helped create activities for the guide. Workshop participants prioritized the water topics they perceived as most relevant for young people, and the project is seeking funds to develop in-depth guides (modules) on each topic, including groundwater.

The Watercourse, a youth and adult water education program, and Project WET, along with the National Hydrology Research Centre, Environment Canada, and the American Ground Water Trust, will publish the *Groundwater Education Module* in the fall of 1996. This module, designed for use by secondary teachers and their students, teaches basic groundwater hydrology and contemporary groundwater management issues.

Model Makes Learning Easy

A Groundwater Flow Model Package—a popular, easy-to-use teaching tool which includes a model, users guide and video, and everything needed to conduct a class or workshop in groundwater education, is also available from Project WET. The model is constructed with a clear Plexiglas front that allows observers to watch water and contaminants move through "underground rock formations." It also demonstrates how surface sources, such as rivers or wetlands, can connect to groundwater.

Project WET is co-sponsored by the Western Regional Environmental Education Council (WREEC) and The Watercourse. WREEC and its partners developed the highly successful Project Learning Tree and Project WILD programs.

For more information on groundwater education materials or WETnet, contact Dennis Nelson, Project WET director, 201 Culbertson Hall, Montana State University, Bozeman, MT 59717-0057, or call him at (406) 994-5392; fax: (406) 994-1919; e-mail: rwwet@msu.oscs.montana.edu

Students Protect Groundwater and Learn Skills
Illinois Groundwater Project Thrives

by William Donato
Northern Coordinator
Illinois Middle School Groundwater Project

Ninety percent of rural residents in the U.S. receive their drinking water from groundwater, and communities across the country are debating critical questions concerning water use and water quality. Many organizations and government agencies attempt to educate the public about the importance of water issues; however, attempts are often isolated and tend to focus on groups or individuals that already know how important groundwater is to their lives. At the same time, there is a demand for schools to make science more practical—more relevant to local community needs.

Working Together

The Illinois Middle School Groundwater Project unites schools, government agencies, and community leaders around the issue of groundwater conservation. The project, initiated in the northern counties of Illinois in January 1994, combines a hands-on curriculum with the support of community members. The goal of the project is to bring groundwater education to middle school students living in three sections of Illinois designated as areas of groundwater concern. Ultimately, the information the project is currently developing will be incorporated into each school's curriculum.

A team of middle school teachers and groundwater experts developed *H2O: Below*, a curriculum that gives students the opportunity to test local well sites and work through a well's history. Most schools adapt the *H2O: Below* curriculum to their individual needs, and many, such as Barrington Middle School in Barrington, Illinois, use a problem-solving approach. First, students and teachers study the entire hydrologic cycle—exploring basic groundwater concepts such as porosity, permeability and capillarity. Then they use a groundwater model to practice basic hydrologic principles—testing variables and exploring concepts such as recharge and discharge.

Students Test Wells and Report Data

Once they have established a background and have a good grasp of basic principles, students turn their attention to local issues affecting them. They test the water they drink and compare it with others in the area.

The Illinois Farm Bureau has been instrumental in developing a well site survey designed for students to use as they test their samples. Working with the local health department, farm bureau and other agencies, teachers and students analyze their watershed—learning first hand the impact of groundwater on their lives.

They test community and private wells for nitrates, pH, chlorine, hardness and iron content. Instead of reading a book about testing, students become active researchers who report data directly to each well owner. They complete well histories, send out land use surveys to citizens, and poll groundwater awareness—reporting their findings to local officials.

Students explore how water can become polluted and learn to distinguish between point and nonpoint source pollution. Then, they work with their parents to complete an inventory of hazardous household products. From this, students begin to realize that they can make a difference in conserving and protecting groundwater.

Students from Lundahl Middle School in Crystal Lake, Illinois, recently presented at a groundwater symposium in Washington, D.C. "It's easy to get excited about this program," says eighth grader Chris Gonew, summing up the reaction of many of the students involved. "It doesn't seem like school. We are actually doing something important. I now think I can make a difference."

Students Share Their Knowledge

As an extension to the program, students act as mentors to other students. High school students are visiting middle and elementary schools teaching the basics of the hydrologic cycle. Eighth graders from St. Bernadette in Rockford, Illinois, visited Rockford Boylan High School. They taught older students about the principles of groundwater and set up hands-on experiments for the high school students. "It was pretty scary at first looking at all those big kids staring at you," admits Summer Hughs from St. Bernadette, "but after we demonstrated a couple of experiments, it was pretty cool!"

The network of teachers and local professionals provides an excellent opportunity for students to become involved in their community while learning about interrelationships between science and society. Not only are misconceptions of groundwater being broken, but the Illinois Middle

Continued on next page

Program Makes It Easy Being GREEN

The Global Rivers Environmental Education Network (GREEN) was born in 1984, when several Huron High School students became ill after windsurfing on the Huron River. As it turned out, the students had suffered from an outbreak of Hepatitis A—a viral infection associated with ingesting fecal matter contaminated with the virus (the hand to mouth route), according to the Centers for Disease Control in Atlanta. Wondering if the river water had become contaminated with the virus led the students to take action.

"If the water had made them sick, they wanted to find out why," says Mike Appel, GREEN Information and Outreach Coordinator. The students then contacted William Stapp, Ph.D., at the University of Michigan in Ann Arbor. Stapp taught at the university's School of Natural Resources and Environment, and, as the students learned, he had a reputation for taking action based on sound analysis, says Appel.

Together, Stapp and the students discovered that the river water's fecal coliform count was high, particularly after a rain storm—about 2,000 fecal coliforms per 100 milliliters, which is 10 times Michigan's allowable limit of 200 coliforms per 100 milliliters for body contact.

Using this information, the students were able to have the windsurfing concession better controlled, says Appel. They posted signs indicating when the water was safe for swimming and, most importantly, when it was not. But they didn't stop there. Stapp and the students then developed a comprehensive educational program known as GREEN, which grew quickly around the Great Lakes region. The program involves water quality monitoring and environmental awareness education.

By 1989, the program got its real boost. Beginning with a series of international workshops on watershed monitoring—conducted on five continents—GREEN now involves educational professionals in 135 nations, with the program growing into a world-wide watershed educational model.

The GREEN educational model revolves around two key content areas:

- water quality monitoring and
- understanding the changes and trends in the whole watershed.

"Finding out that what goes into the water upstream can affect the quality of the water downstream is a critical part of this educational model," says Appel. "And so is getting students to understand their role in this fragile environment."

Through GREEN's educational program, Appel continues, students learn how to monitor the physical, chemical, and biological aspects of water. "Seeing how the water quality changes as it goes through communities helps them understand the real toll of pollution," he says.

Students learn through classroom study and workshops, and they can share information through computer conferences. The program also encourages students to develop student congresses to learn about their communities' land use practices and other human activity that can affect water quality, Appel says.

Other GREEN educational components include:

- an international quarterly newsletter;
- watershed studies educational materials;
- water quality monitoring workshops;
- computer conferences on EcoNet and a GREEN Home Page on World Wide Web; and
- an online database of global water quality information.

"One thing that makes our program different is that we encourage the students to come together and share what they've learned," Appel points out. "We hope that environmental education will promote positive environmental changes."

GREEN offers student, individual, and group memberships with varying costs. And the organization accepts members of all ages.

For more information about GREEN, call (313) 761-8142.

Illinois Groundwater Project Thrives

Continued from previous page

School Groundwater Project affords students an opportunity to break away from textbooks and view school as part of the community.

The project, sponsored by the W.K. Kellogg Foundation, started with 35 schools in January 1994—testing more than 300 wells—and began the fall semester with a groundwater celebration where a wide array of volunteers taught students. Because of partnerships with local agencies and the relevant hands-on curriculum, the project has flourished and currently encompasses more than 100 schools.

For information, contact William Donato, Northern Coordinator, Illinois Middle School Groundwater Project, McHenry County Government Center, 2200 N. Seminary Ave., Woodstock, IL 60098, or call (815) 334-4086.

Slow Sand Filter Serves Dover a Cool Drink

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method, the chlorination system often broke down and provided almost no detention time—which is necessary to kill pathogens in water. Adding to an already worrisome situation, the system's operators found that the water being produced consistently violated the maximum turbidity level.

"With contamination coming from sewage treatment and agricultural activity, this was an accident waiting to happen," says Tanner. So Idaho's DEQ finally stepped in and ordered a continuous boil water advisory for the residents—which lasted for the next six years.

"If you knew our [drinking water] history, you'd be amazed," says Maggie Becker, a Dover city council member. "At least once a week the system would break down. And you don't know what misery is until you've lived without water for three days."

"At least once a week the system would break down. And you don't know what misery is until you've lived without water for three days."

Maggie Becker, Dover city council

According to Becker, Dover, a community of 87 residences, is an old mill town that sits along the Pend Oreille River. The mill owned and operated the original water system. However, a declining economy forced the mill to move out, "and that left nobody to take care of the system."

Dover Becomes a City

With no operator and an ancient water system to contend with, the community decided it should take matters into its own hands—but Dover wasn't incorporated. This presented a real problem for the residents because to qualify for any kind of financial assistance, they had to become a city. Being a persistent bunch, they didn't allow even one barrier to stop them, says Becker. And so, on July 26, 1988, the city of Dover was established.

Ruen-Yeager and Associates, Inc., an engineering firm in Sandpoint, Idaho, conducted a study for the city to establish the best treatment method for the city's water. Using that information, along with a survey of local incomes, the city qualified for a $561,100 grant from Rural Utilities Service, part of the Rural Economic and Community Development mission area (formerly Farmers Home Administration), and financed the remainder of the project through a revenue bond, says Tanner.

The next step was to conduct a pilot study, says Tanner. The community decided on slow sand filtration, which—although it was not the least expensive system to install—provides simple operation and low operation and maintenance costs. "Slow sand filtration is one of the most effective and reliable methods for removing pathogens," says Tanner. "And that's what we were most concerned about."

The pilot study involved operating a miniature slow sand filter, using the same kind of sand and operated in the same manner as a full-scale plant, says Tanner. Idaho's DEQ loaned the community a portable pilot slow sand filter to help them in the study. (DEQ continues to loan out the filter to other communities in the state.) Once the year-long study was completed, the full-scale filter was installed—and the first glass of water was drawn in November 1991.

Maggie Becker, Dover city council member, checks the flow rate of the city's new water treatment system.

Operation Is Easy

According to Tanner's description, slow sand filtration is a method of treating surface water that is simple and reliable. Water influent flows over the surface of the filter and percolates through a bed of porous sand, with the filtered water drained from the bottom. No chemicals are added to aid in the filtration process.

As water filters through the sand, a biologically active layer, or a schmutzdecke, forms on the top layer of sand. The schmutzdecke—the German name for this layer—is made up of deposits, microorganisms, and biofilm. Once the layer is established, the filter will perform beautifully, says Tanner.

After several weeks or months of operation, however, the filter can become clogged and the flow rate can be reduced. When this happens, the operator must drain the filter and shovel off the clogged layer. The filter is then refilled, and the process starts over, says Tanner.

"When you start to see lower water flow—usually down to about 20 gallon per minute (gpm)—the filter has to be cleaned," says Ron Barrett, Dover's system operator. "They need to be cleaned about every two months. Since we

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only have 79,000 gallons of storage, I always alternate the cleaning."

Dover's system has two filters, allowing Barrett to drain and clean one filter while the other is still in operation. "I take every effort I can to make sure there's always water available," he says.

Barrett says it takes him about three hours to clean one filter, and it's very labor intensive. "The hardest thing about operating a slow sand filter is that the cleaning has to be done manually. There aren't any buttons to push or levers to pull—just a shovel and a wheel barrel."

Even with the manual labor, Barrett says he appreciates the simplicity of the system. "It's very basic. The system doesn't change much. It's not like one you have to add coagulant to. And you don't have to worry about having facilities to deal with the wastewater when you backwash."

Besides the system's simplicity, Barrett says there are also differences in the quality of the water. "I also operate a rapid sand filter in Sandpoint," he says. "And one of the biggest complaints customers have about the water there is taste and odor.

"Both systems draw from the same source," he continues. "But Dover's water doesn't get that odd taste that some surface water systems have. I guess it may have something to do with slow sand being a biological treatment while rapid sand is a physical treatment."

System Design Is Simple

According to Tanner, the treatment plant is effluent controlled, with two 652-square-foot (sq.ft.) filter bays. Each bay was designed for a 50 gpm production rate at a maximum filtration rate of 0.075 gpm/sq.ft. During the summer of 1994, the average filtration rate was .045 gpm/sq.ft., producing an average daily demand of 60,000 gallons.

The intake system uses two three horsepower (hp) submersible pumps, and the intake screen lies in 56 feet of water, and is approximately 1,700 linear feet from the shore of the Pend Oreille River. The water is filtered and chlorinated, then pumped by two 7.5 hp centrifugal pumps at 100 gpm through an eight-inch dedicated line to a 79,000-gallon baffled reservoir. The distribution system is then fed from the reservoir at a static pressure of 78 pounds per square inch.

System Has Good News and Bad News

A benefit of a slow sand filter, according to *Drinking Water Quality Management* (Technomic Publishing Company, 1995) is that it has the ability to remove greater than 99.9 percent of *Giardia* cysts found in many raw water sources. Other benefits include routine maintenance and good quality product water.

However, disadvantages to this type of system may be the large amount of land required to install and operate the filter bed. The filter's surface area must be large to accommodate the low flow rates necessary for efficient operation. And "it's about 100 times slower than other sand filtration methods," says Tanner.

Dover residents, however, aren't complaining about anything, says Becker. "The water wasn't fit to drink for so long that most people said, 'Thank you, thank you,'" she boasts. "In our opinion, the quality of the water is excellent."

The old mill town is proud of its accomplishment, and its ability to now provide safe drinking water to its residents. "Dover has easily complied with the Surface Water Treatment Rule and other contaminant levels," says Tanner. "The system really is working beautifully."

For more information about Dover's slow sand filter, contact Steve Tanner at (208) 769-1422.

Dover operates a housed slow sand filter that produces approximately 60,000 gallons of finished water daily. The two 652-foot filter beds were designed with a 50 gallon per minute production rate and generally require cleaning four to six times per year.

The city chose this type of filtration because of its simplicity and overall cost effectiveness. Besides being economical, these filters have a 99.9 percent success rate for removing Giardia *cysts from raw water.*

Filtering Water Makes It Easier To Swallow

by Kathy Jesperson
NDWC Staff Writer

Producing a safe drink of water is what public water systems are all about. These water systems are responsible for operating and maintaining the most up-to-date and reliable treatment options available—and that includes filtering water to remove microbes, turbidity, and other materials.

Most surface water systems know that filtration is inevitable. But filtration isn't just important to comply with the Surface Water Treatment Rule (SWTR)—which requires most surface water systems and groundwater systems under the influence of surface water to filter their water. It's also important to the health of the community.

Why filter?

"There are really three reasons to filter your water," says James Goodrich, environmental scientist with the U.S. Environmental Protection Agency's (EPA) National Risk Management Research Laboratory. "Right now filtering is the best thing going for getting rid of *Cryptosporidium* and *Giardia*.

"Second," Goodrich continues, "by filtering out particles like algae and other microbials, it makes disinfection more effective. If the water is close to being drinkable already, disinfection is simple.

"And finally," he concludes, "you reduce the risk of disinfection by-products with some filtration systems because chlorine often reacts with material in the water, creating harmful by-products such as trihalmethanes."

What is filtration?

Filtration, according to EPA's May 1991 *Manual of Small Public Water Supply Systems*, is "the process of removing suspended matter from water as it passes through beds of porous material." How much of this suspended matter is actually removed depends "on the type and size of the filter media, the thickness of the media bed, and the size and quality of the suspended matter."

According to *Drinking Water Quality Management*, Technomic Publishing Company, 1995, several types of filters exist, including the following:

- *Slow sand filtration.* This process consists of percolating untreated water slowly through a porous bed of sand. No chemicals are added to aid in the filtration process. After the filter has been in operation for awhile, a biologically active layer forms on the top of the filter. This layer, called a schmutzdecke, is made up of deposits, microorganisms, and biofilm, and helps the system function optimally. The advantages of this filter are its simplicity and low cost operation. And an operator need not have extraordinary skills or spend an extensive amount time on its operation and maintenance.

  Disadvantages, however, include the large amount of land needed to support the filter. Primarily, low flow rates make it necessary to have a large filter surface area; however, the exact size of the filter bed depends on how

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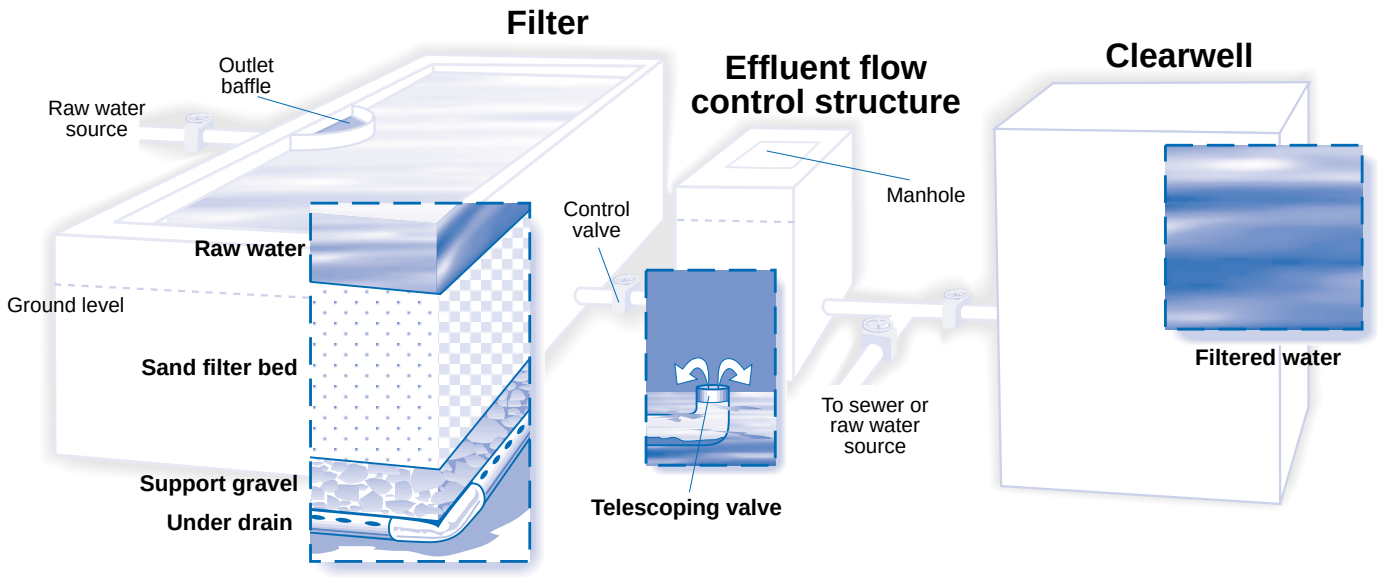
Slow Sand Filter



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much water a system needs to treat. Flow rates for a typical system may be 50 to 100 times slower than a conventional system. And because of low loading rates, storage is necessary to accommodate peak water demands, creating the need for additional space. (See front page story on Dover, Idaho.)

- *Rapid sand filtration.* This process is usually part of a conventional treatment system that employs chemical addition, coagulation, flocculation, sedimentation, filtration, and disinfection. As its name implies, according to EPA's *Manual of Small Public Water Supply Systems*, the process is fast. For example, water is usually applied at a rate at or above two gallons per minute per square foot of filter area, with an allowance for frequent backwashing.

  Because this process relies on gravity, some times a top layer of crushed quartz or anthracite coal is used to slow the process. In addition, the sand must be the proper size for the filter to work efficiently. If it's too fine, it will not allow water to pass through freely, and it will require frequent cleaning. If it's too coarse, it will not effectively remove suspended matter (turbidity).
- *Membrane filtration.* This technology has some of the best prospects for small systems because of the filters' size and cost effectiveness. Further, these filters can be designed for selective contaminant removal, enabling them to remove viruses and bacteria, and lower molecular weight organic and inorganic contaminants.

  "Membrane technology uses a thin sheet of material that is permeable to water molecules, yet forms a barrier for those contaminants it is intended to remove," says David Pask, National Drinking Water Clearinghouse technical services coordinator. According to Pask, a whole range of membrane technologies have been developed, including:
  - particle filtration,
  - microfiltration,
  - ultrafiltration,
  - nanofiltration, and
  - reverse osmosis.

  Often these filters provide all the purification needed for specific drinking water treatment needs. (For more about these types of filters see *On Tap* Spring 1994, page 6.)
- *Pressure filtration*. These filters also use a granular medium to filter water, according to the EPA manual, and are contained in a pressure vessel—which allows for a greater headloss—the resistance that results in pressure loss. Water is filtered at two gallons per minute or more per square foot of filter area. Chemical pretreatment is required and equipment must be provided to allow for frequent backwashing.
- *Diatomaceous earth filtration*. These filters usually come in one of two types—vacuum or pressure. As water passes through the filter, suspended solids are removed at about the same rate as pressure sand filters. The filter has several elements, including small tubes or hollow plates, which are coated with diatomaceous earth. These filters require regular attention because they quickly become clogged. However, when they are properly operated and maintained, they are effective at removing bacteria and cysts.
- *Bag filtration*. With these filters, one or more layers of fabric are formed as a seamless bag, which comes in various micron ratings. These filters usually require a pressure vessel. Particle removal occurs deep in the fabric, leading to longer filter runs and less pressure loss across the filter, says Pask. In most cases, the filters are capable of handling a high volume of dirt and debris between filter changes. And, according to the water quality textbook, they also have shown strong promise for point-of-entry compliance for the SWTR.

Which option to choose?

In considering a filtration option, communities should look at a variety of factors. "You need to know what the raw water quality is and how that quality changes," says Goodrich. "Considering the stability of the source is also a major concern. For example, when a heavy rain occurs it can change turbidity levels dramatically. In cases like that, it's also a good idea to have a storage facility available to aid in the settling of material in the water before treatment."

Other considerations are:

- filtration complexity,
- operator skills required,
- land area required, and
- total system cost.

Unless otherwise noted within the text, all the information about the above filters comes from the Drinking Water Quality Management *textbook, published by Technomic Publishing Company, 1995.*

For detailed information on slow and rapid sand filters, diatomaceous earth filters, and direct filtration, see On Tap, *Winter 1994, page 8. Call (800) 624-8301 to order back copies of* On Tap.

"Right now filtering is the best thing going for getting rid of Cryptosporidium *and* Giardia*."*

James Goodrich, U.S. EPA, National Risk Management Research Laboratory

Cynthia Dougherty Talks about the SDWA

Continued from page 1

to the article, the Democrat's said the riders were a "GOP strategy of using appropriations bills to punish regulatory agencies and grant relief to favored industries." The GOP Whip called the EPA "the Gestapo of government." It's a long, hot summer all over.

In addition to battling for it's own funds, the EPA is actively engaged in efforts to reauthorize the Safe Drinking Water Act (SDWA). One of the primary acts protecting the public's health, the SDWA has been stalled in Congress since last year. That it wasn't reauthorized in 1994 is a source of great disappointment for the EPA.

Over the last few years, Dougherty said, the EPA has provided many recommendations for the SDWA, primarily in three areas: regulatory reform, funding for infrastructure, and "balance in the statute between up-front regulations and a need for prevention programs." The EPA recognizes that ensuring contaminants don't get in drinking water in the first place is the best way to avoid health risks as well as cost.

Law Needs To Be More Flexible

"One, we need responsible regulatory reform," Dougherty said. "We need to have the flexibility to not continue to regulate 25 contaminants every three years." In the 1986 amendments to the SDWA, EPA was mandated to regulate 83 specific contaminants and to select and regulate 25 additional contaminants every three years. For instance, the primary concern for many public water systems (PWS) is microbial contamination—such as *Giardia* and *Cryptosporidium.* These aren't on the original list.

"We do think that there needs to be some sort of a mandate on the EPA to look at contaminants for regulation over time," she said, adding, "we also think we need to change the statutory authorization right now for variances and exemptions."

Cynthia C. Dougherty was named director for the U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water in January 1995. She has been with the EPA since 1974 and the Office of Water since 1978. In 1988, Dougherty became the permits division director in the wastewater management office. She held this position until her recent appointment.

A current problem with variances and exemptions, according to Dougherty, is that the statutory provisions create a cumbersome and burdensome administrative process. She spoke quite a bit about variances, exemptions, and viability. In EPA language, these are very specific terms. Variances and exemptions are defined in the statute. States grant variances and exemptions to PWS under special circumstances so that a system can continue to serve customers—without being penalized by the EPA—even though their monitoring tests show them as above the maximum contaminant level.

A state can grant a variance to a PWS if its water quality is such that even by installing the best available technology (BAT), the system still won't meet standards. A PWS receives a variance for a set time, during which the state works with the system to bring it into compliance. PWS must notify their customers of the variance.

A state grants an exemption from compliance if there are "compelling factors," such as if the community is so poor that it can't afford to meet water quality standards. A state will then exempt the PWS from meeting requirements for a set time.

"Also, with at least one of the bills last year—and there's discussion again this year—the variance and exemption approach would actually require EPA to put out information on small system BAT," Dougherty said, explaining that as the law stands now, the EPA is required to look at technology for the larger systems, rather than the smaller ones. And, she said, even if the EPA would like to concentrate efforts elsewhere, "we're driven by the things that we're mandated to do."

Dougherty said that a good variance and exemption provisions are essential tools for states and the EPA to use in helping small systems address viability concerns. The EPA defines a viable system as one that has the financial, technical, and managerial capacity to consistently provide quality service at an affordable cost.

Viability Isn't a Bad Word

"In traveling around the country the last several months, I've heard that people look at viability as a bad thing," she said. "To me it's not a bad thing. It's a good thing to help systems figure out what is the best way that they can provide their service, and their service should be providing good safe water.

"Viability is important as a tool," Dougherty continued, "not as a way to punish someone or not allow a system to exist, but to make sure that we can assess PWS and ensure that systems

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understand what they've got to do to provide service to their customers."

She said the EPA wants to see that PWS and states have tools—"restructuring tools that come short of folding a small system into a large system.

"Not to close them down," she emphasized, "not to have a community-controlled federal program on viability. And not to have a list of names of nonviable systems, but to provide the support that systems need to recognize when they're getting to the edge—the gray area.

"You have systems that are already out of compliance—and you know you need to look at those systems—but there are other systems who, if they sit down and look at where they're going to be over the long term, will realize that they're going to have problems. And we need to be looking at different things to do." She suggested that small systems can sometimes reduce costs by sharing operators or going in together with other small systems to acquire supplies or laboratory services.

And as costs rise, such partnerships may be unavoidable. More than 50,000 of the 58,000 community water systems in the U.S. are small water systems—serving up to 3,300 people. Many of these systems were developed when regulations were few and water treatment costs low.

Infrastructure Funds Are Needed

The second area, Dougherty said, is making sure that there is a way to provide funding for drinking water infrastructure needs over the long term. The agency recommends a drinking water state revolving fund (SRF) to provide loans—particularly for small communities.

"The President supports that very strongly," Dougherty emphasized. "Even in his approach to balancing the budget in 10 years, he would still fund drinking water loan funds."

She admits that there's a real issue as to whether a loan program is of value to small communities with extremely limited funds. The poorest communities can't take out loans because they can't afford to pay them back. And, she said, some PWS need to obtain grants for disadvantaged communities, such as those available to publicly owned and nonprofit systems through the Rural Utilities Service. The proposed EPA SRF would focus on drinking water compliance, and these funds would not be limited to public systems.

Prevention Programs Are Imperative

"The third area," Dougherty said, "is making sure that there's a balance in the statute between up-front regulations and national standards versus the need to have prevention programs to ensure that contaminants don't get in drinking water sources in the first place. I don't believe there's a balance in the current law.

"We'd like to see something in the law that provides both recognition and incentives for states and communities to have source water protection programs. We also believe that states should have viability programs to ensure that small systems are capable of providing safe drinking water over the long term to communities," she said, adding that states and communities need to be certain that they can operate long term and provide safe water long term.

"We're thinking about the federal role in prevention as being to work with the states to establish criteria for source water protection and viability programs," she said. The EPA has the unenviable task of establishing rules that will protect the most people for the least amount of money. But this is a huge country and there's no way to consider each individual system at the federal level.

"We have also suggested some changes to the enforcement provisions of the act so that the federal enforcement process is less bureaucratic or less bureaucratically burdensome," she added.

Customers Have a Right To Know

Dougherty believes that states and communities need to give consumers more information about what's happening with their drinking water, "where it comes from and what's done to treat it, if it is treated, so that consumers can participate in the decision-making process if they want to.

"As the EPA provides more flexibility, PWS need to be more accountable to the people they serve," she said.

"There's some discussion of changes in the area of public notification," Dougherty said, "and we think it's very important to listen to what all the stakeholders have had to say in our reassessment."

SDWA Needs Public Health Bias

The EPA has been hosting stakeholder meetings, composed of individuals who "have a stake in" EPA decisions. The purpose of these meetings is to explore the concerns and needs of the regulated community. (See related story, pages 4-5.)

"The bottom line in terms of how we develop standards is that standards must have a bias toward public health protection," Dougherty stressed. "That's what the SDWA is about. And we have to make sure that we have that bias.
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"We'd like to see something in the law that provides both recognition and incentives for states and communities to have source water protection programs."

Cynthia Dougherty, Director, U.S. EPA Office of Water

Cynthia Dougherty Talks about the SDWA

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That's one of the biggest issues under discussion." She conceded that there's intense disagreement on what "public health protection" means—even within organizations.

"We'll still have schedules that include regulating contaminants that we don't think are the most important contaminants for us to pay attention to," she said. "Under the existing statute, only the courts can decide whether or not the EPA can change the schedules for pollutants, regardless of priority in terms of public health protection."

Dougherty believes that a reauthorized SDWA will benefit small systems. "I think it's going to provide more tools to assist small systems than have existed before," she said, adding that she thinks the reauthorized law will pay more attention to small systems issues than the current law does. She hopes the act will give states the option of tailoring monitoring requirements and variance and exemption programs so that they suit small systems better.

"I think source water protection will be really important for small systems, since a great number of influences on their drinking water sources may be out of their control."

Source water protection, strengthening small systems' capabilities, and more technical assistance for small systems emerged as very important issues during some of the stakeholders meetings, Dougherty said.

EPA wants "to help communities empower themselves so that what they do is in their hands as opposed to someone else telling them what they need to do," she said. "And in terms of strengthening small systems' capabilities, stakeholders identified needs for case studies on small system restructuring and state viability programs."

EPA Relies On Partnerships

However, EPA's technical assistance role is essentially one of orchestrating partnerships. "Even if we got the budget that we had asked for, as opposed to a tremendous cut in our budget, EPA doesn't have a lot of resources to go out and do technical assistance itself," Dougherty said. "Effective partnerships are really the key for us there.

"We've been working on some guidance documents which deal with viability and small systems issues," she said. "That's clearly a big part of what we see ourselves doing.

"We look to ourselves as, at best, playing the role of catalyst or facilitator in a lot of these areas—working with states, working with third party technical assistance providers, the National Drinking Water and Small Flows Clearinghouses, among others.

"As the result of all the stakeholders meetings, we've gone through a very extensive process—that's not finished—but a very extensive process where we look at the resources that we have in the groundwater and drinking water programs.

"I think what we probably didn't understand was the real cost of following through on some of the things on the standards side.

"We know that we have to be able to collect better data, not just for purposes of standard setting, but overall for the program. We know we have to convince people that the science on which we're basing our decisions is sound science; whether people believe it has been in the past, we probably have to do a better job of defending the basis on which we make our scientific decisions," Dougherty continued.

It All Comes Down To Viability

"We want to make sure that we focus our standard-setting activities on those contaminants that pose the highest risk to human health. We want to try to encourage and facilitate prevention activities, and that covers viability and source water protection.

"We know that we want to make sure that we have reasoned implementation and oversight. And it is very important that we work effectively with our state partners.

"It's an interesting set of challenges," Dougherty grinned, her wry humor surfacing. "You couldn't have come at a more interesting time."

And the challenges for the future of small systems?

"It all comes back to viability," Dougherty stressed. "I haven't quite figured out why that's such a powerful word. We've got to look at where we have systems that are working *now*. We've got to make sure that we're planning *now* for the repair and replacement of the infrastructure as it ages.

"We've got to ensure microbiological safety of drinking water. We've got to be able to provide small systems with the tools they need to assess how they're going to operate long term, and what they can do to make their operations either more cost effective or more technology effective so that they can provide the best possible service for the least amount of money."

Water Fact

Nearly one million Americans lack direct water hook-ups in their homes.

—USDA Rural Utilities Service, Water 2000: A Plan for Action

Water Festival Workshop Slated for Fall

by Chris Berry
National Small Flows Clearinghouse Staff Writer
Reprinted with permission from Small Flows, *Summer 1995, Vol. 9, No. 3*

Water festivals are held all year long around the country. But when spring comes bursting forth in all her glory, so do the water festivals.

To help festival organizers prepare for successful activities, The Groundwater Foundation is sponsoring "Priming the Pump: A Water Festival Workshop," to be held in Nebraska City, Nebraska, September 22–23.

The conference will focus on organizing water festivals and other programs aimed at grade school children. A water day consists of explaining and demonstrating how to conserve, as well as protect water quality. Children will have the opportunity to do hands-on activities. "It's fun entertainment for the kids. They are very receptive to it," said Amy Killham, program director for The Groundwater Foundation.

Eight to 10 guest speakers are anticipated for the Nebraska event, including Patricia Miller, Ph.D., National Small Flows Clearinghouse (NSFC) outreach coordinator. Miller will present workshops that explain how to educate students about septic systems. Several speakers will discuss how they organized their own water festivals. Fundraising and promoting water festivals will also be discussed.

Nancy Galloway from Moscow, Russia, is slated to speak at the conference. Galloway is developing a water festival in New Delhi, India. She is presently involved in water education in Moscow.

Killham explained, "Presentations by water festival organizers and water educators will discuss what works best to keep the kids' attention and how to develop a water day at grade schools." In addition, evaluation techniques to determine the success of water festival programs will be discussed.

"Priming the Pump" is an annual event that last year attracted more than 100 participants from around the country.

For more information on "Priming the Pump," contact The Groundwater Foundation at (402) 434-2740, and request a brochure.

NETCSC Hosts Train-the-Trainer Workshop

The National Environmental Training Center for Small Communities (NETCSC) will host a train-the-trainer workshop for environmental systems management.

NETCSC will hold a "Basics of Environmental Systems Management (BESM)" program September 27–28, in Chelmsford, Massachusetts. Environmental trainers and technical assistance providers who participate will become familiar with the BESM curriculum. They will also learn techniques for delivering BESM training to local officials, as well as how to use camera-ready training materials.

The content of the workshop includes:

- Drinking water and wastewater regulations
- Drinking water treatment and distribution
- You as a decision maker
- Group decision-making techniques
- Citizen involvement techniques
- Inviting citizen participation

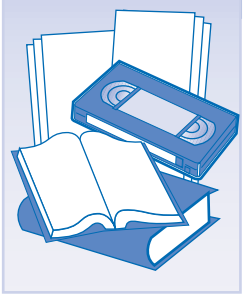
BESM cost is $190 per person. If two or more people from your organization attend, the cost is $125 each. The fee covers course materials—including a trainer's manual, master copies of training materials, and transparency masters—lunches, and refreshments.

For more information on this training program, contact Sandy Miller at (800) 624-8301, ext. 536.

Training Information Is Available

Are you interested in more information on training programs? *E-Train*, The Environmental Training Newsletter for Small Communities, a quarterly publication produced by the National Environmental Training Center for Small Communities (NETCSC), keeps you informed about the latest training sessions for water, wastewater, and solid waste professionals. For a free copy of *E-Train* or to have your name put on the mailing list, call (800) 624-8301 or write to *E-Train* Editor, NETCSC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506.

For current training program schedules, contact Sandy Miller, NETCSC conference manager, at (800) 624-8301, ext. 536.



The Children's Groundwater Festival Works

The Groundwater Foundation holds a Children's Groundwater Festival each year in Grand Island, Nebraska. At the festival, children write their own public service announcements or create an "Aquifer-In-A-Jar," which they "pollute" with drops of food coloring. Others examine aquatic insects through a microscope connected to a television monitor.

This year, U.S. Environmental Protection Agency Administrator Carol Browner, Nebraska Governor Ben Nelson, and 3,000 students attended the festival—the seventh annual day-long, hands-on event.

In 1994, the foundation released the results of a year-long study, designed and conducted by The Groundwater Foundation and the Rensselaerville Institute, which found that children's behavior and attitudes about groundwater do change as a result of participation in the festival. In fact, their knowledge about groundwater increased 23 percent. Thirty-eight states and foreign countries now feature groundwater festivals. There's even a newsletter called *Sprinkles*, the water festival newsletter which provides new ideas for water festival organizers.

For more information, contact The Groundwater Foundation, (402) 434-2740. To obtain a detailed executive summary and/or the complete report of the study, write the Foundation at P.O. Box 22558, Lincoln, NE 68542-2558.

EPA Offers Pollution Prevention Directory

The U.S. Environmental Protection Agency's (EPA) Office of Pollution Prevention and Toxics is offering a revised 103-page directory of publicly sponsored pollution prevention resources, including technical assistance programs for small and medium-sized businesses, universities in each state that conduct research and training, and information about federal pollution prevention assistance programs.

The EPA defines a pollution prevention program as "a comprehensive and continual effort to systematically reduce or eliminate pollution and wastes." Part of such a program is "source reduction," which the 1990 Pollution Prevention Act defines as reducing the amount of hazardous substances, pollutants, or contaminants entering waste streams or that are released into the environment prior to recycling, treatment, or disposal.

By implementing pollution prevention practices, businesses and organizations can reduce the costs of pollution control and waste disposal, improve regulatory compliance, reduce the liability associated with the management of hazardous materials and wastes, and improve employee safety.

This free *Pollution Prevention Directory* and other information on EPA's programs may be ordered from the Pollution Prevention Information Clearinghouse, EPA, 401 M St., SW 3404, Washington, DC 20460, or by calling (202) 260-1023. When ordering the directory, request EPA publication #742-B-94-005.

Information is also available via Internet on EPA's Main Gopher Server at gopher.epa.gov. By using Gopher's word search capability, you can type *pollution prevention* when you log on the server and a list of publications will appear, including the *Pollution Prevention Directory*.

Do you like to talk water?

WaterTalk is the communications system of the Universities Water Information Network (UWIN). Designed to link those with water resources interests, WaterTalk provides a convenient communication forum for researchers, teachers, managers, consultants, and administrators in the academic, private, and governmental sectors.

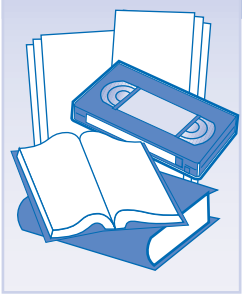
The system is set up as a series of discussion forums. Each forum is devoted to a particular water-related topic, including hydrology, geology, global water issues, groundwater quality, water policy issues, and education. And users are encouraged to suggest other forum topics they would like to see.

A user may participate in a discussion by either:

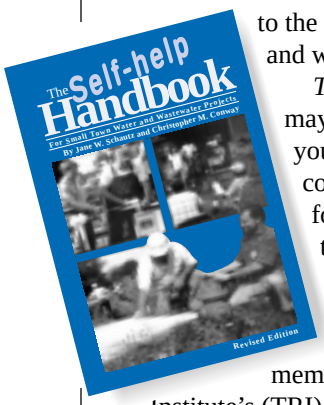
- logging onto the WaterTalk Bulletin Board System;
- subscribing to WaterTalk discussion forums in a mailing list format and receiving messages at an e-mail address; or
- having your organization receive the forums as Usenet-style newsgroups.

WaterTalk discussions are also archived at UWIN's gopher and World Wide Web sites, which are located at gopher.siu.edu and http:\\www.uwin.siu.edu respectively.

For more information about WaterTalk, e-mail your questions to UWIN at admin@uwin.siu.edu.



STEP Publishes Self-Help Handbook



In this era of cutbacks, down sizing, and funding shortfalls, everybody is looking for ways to save money. And literally thousands of small communities are searching for low-cost answers to the problem of inadequate water and wastewater infrastructure.

The Self-Help Handbook may provide the guidance you're looking for. It is a comprehensive guidebook for communities that undertake self-help projects.

Written by Jane W. Schautz and Christopher M. Conway, senior staff members of The Rensselaerville Institute's (TRI) Small Towns Environment Program (STEP), it describes a set of tools that small communities can use to reduce the costs of drinking water and wastewater projects.

It is intended as a desktop reference for three primary audiences: local residents, including elected officials, plant operators, and state and federal officials responsible for water and wastewater facilities. The book overflows with ideas, suggestions, and resources.

"For our purposes," Harold Williams, president of TRI, explains in the book's introduction, "self-help refers to collective effort: people working together to create or improve a service or facility that they will use in common but which is not exclusively owned by any one person or household."

TRI, a nonprofit development center established in 1963, has operated STEP since 1989 with major support from the U.S. Environmental Protection Agency and The Ford Foundation. STEP's mission is to help states achieve compliance with health standards in less time and for less money, and help communities to meet environmental standards while sustaining an improved quality of life.

The Self-Help Handbook, Revised Edition, costs $21.95, plus $3 shipping and handling. For more information on STEP or to obtain a copy of the handbook, call (518) 797-3783, or write Small Towns Environment Program, The Rensselaerville Institute, Rensselaerville, NY 12147.

GEM Provides Wealth of Information

The Groundwater Education in Michigan (GEM) program provides a wealth of information that helps people understand the relationship between their actions and the quality of their environment.

In its seven years of operation, GEM has supported the development of more than 35 projects ranging from groundwater education for school children to community wellhead protection. Many of the "stories" are contained in their publication *Precious GEMs: Groundwater Education Strategies that Work.*

To better share insights and advances, GEM established GEMNET, an e-mail and bulletin board system where anyone with a computer and modem can access information on groundwater, surface water, and other environmental issues.

To access GEMNET, at the host prompt, type: *gemnet.rs.msu.edu*. If direct access or a local number to access the Internet is unavailable, users with a modem and communications software can dial MSUnet at (517) 353-8500 (300-2400 Baud) or (517) 432-3200 (9600-38400 Baud), and log in as *guest*. At the MSU prompt, telnet using the above address. Communications parameters should be set to 8 data bits, 1 stop bit, no parity. Long distance charges will apply.

Established in 1988 through the cooperative efforts of the Institute of Water Research at Michigan State University and the W.K. Kellogg Foundation, GEM has a network of local community groups and universities across the state who share environmental information, particularly groundwater facts.

For a free copy of *Precious GEMS*, mail a request to: W.K. Kellogg Foundation, P.O. Box 5196, 180 South Union St., Battle Creek, MI 49017-4918.

For a copy of *Tapping the Source*, a listing of GEM educational materials, contact Ruth Kline-Robach, Institute of Water Research, 115 Manly Miles Building, MSU, 1405 South Harrison, East Lansing, MI 48823-5243, or call her at (517) 355-0224.

Reading *Water Sense* Makes Sense

Do you have big plans for your small community water system? Even great ideas won't get far without funding. *Water Sense*, a quarterly publication produced by the National Drinking Water Clearinghouse (NDWC), offers financial drinking water news for America's small communities. For a free copy or to put your name on the mailing list, call (800) 624-8301 or write to the NDWC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064.

On Tap is printed on recycled paper.

Viability and Assessment Products Available

Note: The free items listed below are limited to one of each per order. A minimum $2 shipping and handling (s/h) charge applies unless otherwise noted.

Call (800) 624-8301 to place an order. Please allow four to six weeks for delivery.

Self-Assessment for Small Privately Owned Water Systems

Item #DWBLMG01

This 28-page 1989 U.S. Environmental Protection Agency guide will assist local officials in identifying current or future management problems and suggests steps to remedy them. A series of questionnaires is included that can help assess a system's financial condition.

Cost: $4.10

Helping Small Systems Comply with the Safe Drinking Water Act: The Role of Restructuring

Item #DWBLMG12

This 1992 pamphlet uses a question and answer format to address some of the most commonly asked questions about restructuring. It also provides sources for additional information.

Cost: $0.00

Improving the Viability of Existing Small Drinking Water Systems

Item #DWBKGN06

This 1990 report provides information about ways others have successfully addressed problems common to small drinking water systems. Case studies, a contact list, and recommendations for implementing state programs are included.

Cost: $6.90

POU/POE Units and Home Water Testing

Item #DWPCGN11

This 11-page document is a collection of questions and answers about point-of-use units, which deliver treated water to a drinking water faucet and about point-of-entry units, which treat all water entering a home or building. Information provided includes the differences between the two water treatment devices, their operations and effectiveness, production, and regulations. Some associated addresses are presented for contact when further information is needed.

Cost: $1.60

Technical and Economic Capacity of States and Public Water Systems To Implement Drinking Water Regulations: Report to Congress

Item #DWBKGN20

This 172-page book examines the financial and technical capacity of states and public water supply systems to comply with the federal drinking water regulations. The report, prepared for Congress, contains detailed cost estimates of all federal regulations, and it recognizes that small communities face the greatest challenge in meeting the regulatory requirements.

Cost: $0.00

NDWC Mission Statement

The National Drinking Water Clearinghouse assists small communities by collecting, developing, and providing timely information relevant to drinking water issues.

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