

Fall 1997
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Water 2000: Millennium Approaches

In 1994, the Clinton Administration launched the ambitious Water 2000 project. The purpose of this U.S. Department of Agriculture (USDA) initiative is to provide "safe, affordable drinking water in virtually every home [in the U.S.]—no matter how remote or distressed—by the year 2000." As the millennium approaches, how is Water 2000 progressing?

At the end of June, Vice President Al Gore announced the



largest action to date under the Water 2000 initiative. The USDA has dedicated an additional \$112.4 million to safe drinking water projects for rural Americans. (See related article this page.)

"It's hard to imagine," Gore said, "but even in 1997, millions of Americans raise their families without a resource as basic and as necessary as safe drinking water. But it shouldn't be this way." *Continued on page 12*

Dan Glickman, Secretary of Agriculture, right, discusses new funding for Water 2000 as Vice President Al Gore, and Emma Gresham, mayor of Keysville, Georgia, listen.

Largest Water 2000 Investment to Date Funding Announced for 84 Projects

"Turning on the kitchen faucet shouldn't tap a parent's deepest anxieties. So today, we take an important step to do better," said Vice President Al Gore June 27, when he announced the largest single investment to date in the Administration's Water 2000 initiative.

The \$112.4 million will be used to fund U.S. Department of Agriculture (USDA) loans and grants for 84 safe drinking water projects in 43 states and Puerto Rico. That investment will leverage another \$35.2 million from other federal, state, and local sources to help meet the goal of providing safe drinking water to all Americans in need by the year 2000.

"Water 2000 is a key part of our commitment to invest in rural America—to improve the quality of life, protect public health and safety, and foster economic sustainability," said Secretary of Agriculture Dan Glickman during the White House ceremony marking the investment.

Keysville, Georgia, Mayor Emma Gresham also spoke at the event, relaying how important

the Water 2000 project in her community is to many elderly residents, who prior to the project had never had running water in their homes. Although many in the U.S. might believe such circumstances to be rare, USDA estimates that nearly one million rural Americans live without running water and another 1.5 million face serious water quality or availability problems.

Through its Water and Wastewater Program loans and grants, the USDA provides infrastructure funds for communities that cannot obtain financing from private lenders or state governments. Since launching the initiative in August 1994, USDA has invested more than \$1 billion in loans and grants to more than 900 communities in all 50 states.

For more information about Water 2000, see the article above. You may also access the USDA Rural Development's Water 2000 Web site at <http://www.usda.gov/rus/watr2000/index.htm>. ■

See NDWC
Survey Inside

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OnTap

Sponsored by
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Have drinking water questions? We Can Help

This issue of *On Tap* begins with Vice President Al Gore's announcement of funding for 84 Water 2000 projects. We include also an overview of the Water 2000 project since its inception, as well as comments from assistance providers on Water 2000 projects in Iowa and Minnesota. (See page 1.) And we include comments about Water 2000 from Mike Keegan, policy analyst for National Rural Water Association.

Michelle Moore, National Drinking Water Clearinghouse

(NDWC) contributing writer, takes a look at the water tasting contests that are becoming popular around the country. (See page 5.) Staff Writer Kathy Jespersion continues our two-year Safe Drinking Water Act follow-up series. (See page 6.) And educators in particular will be interested in Moore's feature on a North Carolina education project that introduces high school students to careers in the drinking water field. (See page 8.)

Our operator section touches on the very important subject of drinking water system safety. We've included a selection of safety sources: publications and Web sites. (See page 14.) We plan to provide more coverage of safety in future issues. If you know of resources that may interest *On Tap* readers, please let us know.

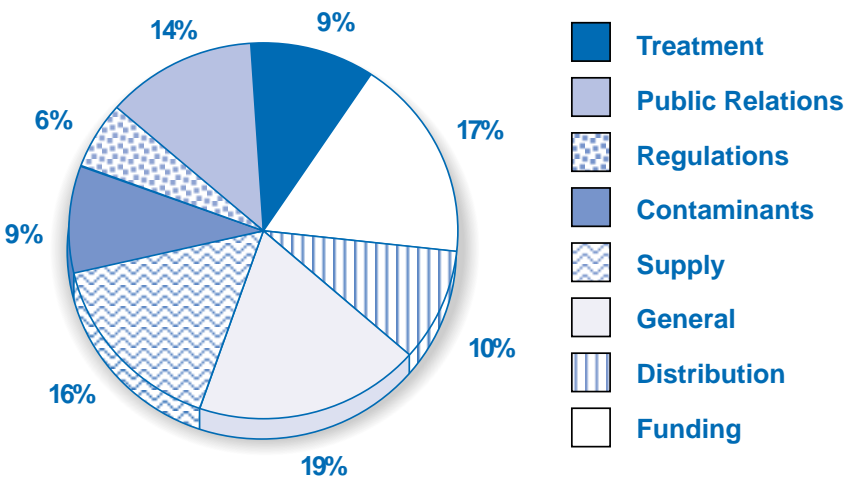
While our newsletters are the most visible NDWC service, the clearinghouse distributed more than 5,000 free and low-cost educational brochures, booklets, videotapes, posters, and other drinking water information in the third quarter of 1997 (March 1–May 31). Approximately 1,000 individuals visited our Web site during that period. And it is now possible to order products online. (See page 18.)

Another extremely important service NDWC offers is phone technical assistance. If you run into drinking water system problems and need to talk with an engineer, call us. In the third quarter, the NDWC received hundreds of toll free calls, including more than 160 specific technical assistance calls. If you call for information, you are likely to talk with Mohamed Lahlou, NDWC

technical assistance specialist; or one of two research assistants, Salam Murtada and Babu Madabhushi. Callers have requested information on topics from primary drinking water regulations to public relations. The chart below gives a breakdown of subjects on which our engineers received calls during the third quarter.

Lahlou also reviews *On Tap's* technical articles and compiles our fact sheets—the topic for the Tech Brief in this issue is organic removal.

Third Quarter NDWC Technical Assistance Calls



(See center pages.) Murtada compiled the information for the Q&A on extruded carbon filters while Lahlou provided an answer to the question about disinfectants and *Giardia lamblia*. (See page 16.)

We want to know what you think of our publication and what topics you'd like to see in future issues. Please take the time to fill out the NDWC survey in the center pages of this *On Tap* and mail it back to us. We value your opinion.

If you need technical assistance or have comments about *On Tap*, the NDWC address, phone numbers, and Web site URL are listed in the staff box at the left. You may e-mail hemerson@wvu.edu or mlahlou2@wvu.edu. As always, many thanks to the drinking water professionals around the country who contributed to this issue of *On Tap* and to our readers for whom we gather information. ■

Harriet Emerson
On Tap Editor

USDA, EPA, and HUD Reduce Red Tape

Three major government agencies that fund drinking water and wastewater projects are working together to simplify the loan process. Cognizant that the need for water and wastewater facilities far exceeds the financial resources available, the U.S. Department of Agriculture (USDA) Rural Utilities Service (RUS), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Housing and Urban Development (HUD) are reducing red tape and consolidating paper work in a move toward maximizing benefits to communities.

Through its Water and Waste loan and grant program, RUS assists lower income rural communities of up to 10,000 meet drinking water and wastewater needs. Administered by state and local USDA Rural Development (RD) offices, \$1.2 billion is available through these programs for fiscal year (FY) 1997.

EPA makes annual capitalization grants to states for loans to municipalities under the Clean Water State Revolving Fund (SRF) authorized under the Clean Water Act. These loans can be used for wastewater, agricultural and urban runoff, and storm water. And the Drinking Water State Revolving Fund (DWSRF), under the reauthorized Safe Drinking Water Act, provides loans for infrastructure. States may elect to use a portion of DWSRF funds for activities, such as source water protection and enhanced water system management. EPA's two SRF programs annually provide approximately \$1.8 billion of financial assistance, primarily loans.

HUD makes block grants to states under the Community Development Block Grant (CDBG) program for smaller communities (those not eligible to receive CDBG funds directly from HUD.) Generally, HUD-administered and state CDBG program funds are distributed to units of local governments having populations of fewer

than 50,000 and counties with a population of fewer than 200,000. In FY1997, HUD will provide almost \$1.3 billion for non-entitlement communities. Water and wastewater projects, as well as individual hookups, planning and technical assistance, are eligible uses of CDBG funds, as long as they meet a national objective—usually benefiting low- and moderate-income persons.

RUS, EPA, and HUD have agreed to encourage administrators of state CDBG and SRF programs and the USDA RD state directors to cooperate in preparing consolidated operating, intended use, and strategic plans required under the three agencies' programs, thus reducing duplication of planning efforts.

The agencies have agreed to encourage cooperation at the state level by removing barriers in program regulations and policies, such as coordinating funding cycles on a state-by-state basis or sharing common information submitted with applications in areas where state SRF, CDBG, and RD state officials can work together. Headquarters will provide case studies.

They have agreed to cooperate on the preparation of environmental review documents on jointly funded projects. The goal is to have one environmental document per project that meets all three agency's requirements. When possible, agencies involved should jointly complete the environmental document under the leadership of a "lead" agency. The agencies did not prescribe a formula for selecting a lead agency, believing the decision is best determined at state and local levels.

The agencies appointed the following headquarters staff to provide national leadership Laurence Bowman, RUS; Jamie Bourne and Richard Kuhlman, EPA; and Stephen Rhodeside, HUD. ■



RUS Interest Rates Unchanged Fourth Quarter

The interest rates for Rural Utilities Service (RUS) water and wastewater loans remain unchanged for the fourth quarter of fiscal year 1997.

These rates are set quarterly at three different levels, which have specific qualification requirements. The new rates, effective July 1 through September 30, 1997, are:

- *poverty line* rate: 4.50 percent;
- *intermediate* rate: 5.00 percent; and

- *market* rate: 5.50 percent.

RUS loans are administered through local or state Rural Development offices, which can provide more information about loans and applications.

For the phone number of your state Rural Development office, contact the National Drinking Water Clearinghouse at (800) 624-8301 or (304) 293-4191.



Finnish Study Links DBPs to Cancer in Rats

In a June press release, CNN reported that a Finnish study links MX to several types of cancer in rats. MX is one of several disinfection byproducts (DBPs) formed when chlorinated drinking water reacts with organic compounds.

Researchers reported their findings in June's *Journal of the National Cancer Institute*. The study says that "although these findings cannot be extrapolated to humans, MX should be studied as a candidate risk factor" in the consumption of chlorinated drinking water.

In the study, rats, who were fed high doses of MX in drinking water, developed cancer or tumors of the thyroid, lungs, skin, breast, liver and pancreas.

According to Dr. Ronald Melnick, National Institute of Environmental Health Sciences, the cancer potency of MX is up to 170 times greater than some other chemical byproducts in chlorinated water, such as chloroform and bromodichloromethane. However, Melnick says that Finnish researchers used a dosage of MX

thousands of times higher than what is present in the typical U.S. water system.

Scientists in the National Toxicology Program, under the auspices of the National Institutes of Health, are launching a two-year study of MX and other disinfection byproducts.

Melnick agrees that MX should be studied but in no way suggests removing chlorine from public drinking water. Chlorination controls many waterborne diseases, including typhoid fever, cholera, and dysentery. The release notes that when chlorination was stopped recently in Peru, a cholera epidemic that impacted 300,000 people broke out.

One way to control MX is to filter water before chlorine is added. The organic compounds that react with chlorine are then removed. Many drinking water plants have been reconsidering prechlorination as they await the Disinfectants and Disinfection Byproducts Proposed Rule from the U.S. Environmental Protection Agency. ■

EWG Reports Pesticides in Drinking Water

The Environmental Working Group (EWG) made prime time news across the country the week of August 11 with "Hard To Swallow," a report on pesticides in Midwestern drinking water.

According to EWG, in 1997, the third year the group tested drinking water, their analysis found 10 different pesticides and metabolites in a single sample of water taken from a tap in Williamsburg, Ohio, a suburb of Cincinnati. While Williamsburg presents the worst case scenario, when EWG analyzed 1996 data collected by state agencies across the corn belt, they found that 104 communities—a total population of 3.3 million people—drank tap water contaminated with five or more toxic weed killers.

Why is this coming to light now? EWG cites passage of a 1996 law, the Food Quality Protection Act (FQPA) that requires food tolerances (safe levels, ie. that levels do not exceed a one in a million cancer risk) take into account all exposure to pesticides, including exposure via drinking water, and that this aggregate exposure must be safe for infants and children. Prior to the passage of the FQPA, health risks from pesticides were addressed only under the authority of the Safe Drinking Water Act.

The American Water Works Association (AWWA) supports efforts to reduce or eliminate pesticides in drinking water and cites EWG's

report in an August 12 press release. AWWA states that atrazine, a triazine herbicide, has the largest number of drinking water standard violations for any man-made chemical. Their release notes also that alternatives to triazines do exist.

The Environmental Protection Agency (EPA) is conducting a special review of triazines to determine how to best minimize source water contamination from these herbicides. The review will be completed in 1998.

Many water utilities throughout the corn belt are investing huge sums of special treatment measures—usually granular activated carbon (GAC)—to reduce the level of pesticides (and herbicides) in finished drinking water. While effective in removing pesticides, GAC treatment is expensive and often beyond the financial reach of small drinking water systems.

For more information about the "Hard To Swallow" report or EWG's reports on 12 states, see the EWG Home page at <http://www.ewg.org/>. For information on pesticides in tap water, call the EPA at (800) 858-7378. For information on drinking water regulations, call the EPA Hotline at (800) 426-4791.

For information on methods of reducing pesticides, see "Tech Brief: Organics Removal" in the center pages of this issue. See also our Q&A on extruded carbon filters, page 16. ■

Water Tasting: Toast to the Tap Sparkles

by Michelle Moore
NDWC Contributing Writer

How do you rate the taste of something whose most attractive quality is tastelessness? Municipal waterworks around the country periodically stage water quality contests to show off their product and their staff. Drinking water can have distinct qualities that not only affect the flavor, but also the appearance, overall feel, and smell. Like sampling fine wines, what better way to judge waters than with a taste test?

One contest that has grown to international proportions is the "Toast to the Tap: International Water Tasting and Competition" held in Berkeley Springs, West Virginia, each winter during their Festival of Waters.

Last year, 12 judges met the challenge to decide which of 82 waters from 23 states and four countries (at last count) tasted best. The eighth annual Toast to the Tap, sponsored by Travel Berkeley Springs, is scheduled for February at the Coolfont Resort. The contest brings representatives of municipal, bottled, and sparkling waters together, and first prizes have been awarded to cities as diverse as Kent, Ohio, and Atlantic City, New Jersey.

"We have an awful lot of fun with this contest," festival promoter J.W. Rone said. "What was originally designed as a public relations event to bring business to Berkeley Springs during the off season turned into a hard news story. It hit the Associated Press wire and went like wildfire around the country—and the world, for that matter."

Publicity through CBS, CNN, BBC, Fox, and other broadcasting networks and publications helped this obscure water-tasting contest attract municipal water representatives from across the U.S. Bottled water producers from as far away as Hawaii, Italy and France also compete.

Contest Gains Reputation for Fairness

The contest has gained a reputation for accurate judging and fair competition—in part from the festival's autonomous nature. "We aren't connected with the water industry in any way," Rone said. "But we certainly take input from sources like the AWWA [American Water Works Association] and the NRWA [National Rural Water Association] because we do work closely with all of them."

Municipal waters and bottled waters are judged in separate categories. The judges rate the waters according to these point values: appearance, odor, mouth-feel, and aftertaste on a point scale of 1–5; flavor 1–10; and overall impression

1–14. Each water can accumulate a maximum of 44 points. Then the judges' scores are totaled together for a final score.

Rone said two bottled waters tied for first place last year. "That was pretty surprising when you think of all of the variables and point possibilities. Results of the contest over the years have proven that the rating scales provide a pretty accurate measure of a water's qualities.

"When I look at the outcome of the contest," he continued, "I can see that our rating system is consistent. The same waters don't always win, but the way they are judged fairly estimates a municipality's product."



Sheila Anderson, National Drinking Water Clearinghouse (NDWC) administrative secretary, right, listens as Sanjay Saxena, NDWC program coordinator, discusses the qualities of water.

The overall impression category sums up a judge's estimation of a water: "This water has a terrible strong taste, I can't stand to have it in my mouth," is for a water earning a meager single point, to "This water tastes really good; I would be happy to have it for my everyday drinking water," that would merit 14 points.

The three-day event begins with preliminary tastings, a seminar, and an opportunity to speak with leading water industry professionals. Arthur von Wiesenberger, a water expert from Santa Barbara, California, reviews the judging process and categories point by point so the judges are familiar with the ratings. Von Wiesenberger's own water tasting contests in California led to the development of Toast to the Tap. He has worked for Anheuser-Busch and Perrier, and is a wine and food critic on radio and television in Santa Barbara. "His interest and excitement have made this contest what it is today," Rone said.

Judges for the contest usually include travel, wine, and food writers in addition to water industry professionals. Sanjay Saxena, program

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Reauthorized SDWA Gains Momentum

by Kathy Jespersen
NDWC Staff Writer

Editor's Note: With this third installment, On Tap continues to track drinking water professionals across the country to see how the reauthorized Safe Drinking Water Act impacts water systems within their states.

August 6 marked the first anniversary of the reauthorization of the Safe Drinking Water Act (SDWA). Although most states continue to gear efforts toward taking advantage of drinking water state revolving funds (DWSRFs), progress has been slow.

Vanessa Leiby, director of the Association of State Drinking Water Administrators, told the Bureau of National Affairs in a June 19, 1997, interview that to date only Georgia and Pennsylvania have received money from the federal fund. Many states are waiting for U.S. Environmental Protection Agency (EPA) guidance, she said.

Another problem is that states have found coming up with matching funds to be a "detailed, cumbersome process" because of the requirements of the SDWA, she added. However, many states—38 to date—have legislative authority to implement the DWSRF this fiscal year, and 10 more have pending bills, Leiby said.

But DWSRFs are only part of the 1996 amendments. Operator certification, source water protection programs, small system viability, and consumer confidence reports seem to top many states' priority lists. The 1996 amendments focus on creating water systems that are viable and that employ qualified system operators. EPA has not yet published final guidance for these two amendments.

The act also establishes the consumers' right to know if their water is safe to drink. EPA regulations are expected for consumer confidence reports by August 1998. And the act defines source water protection as a cost-effective measure for ensuring safe drinking water supplies. Guidance on source water protection is available from EPA in August 1997. Although EPA has not published final guidance in many areas of the SDWA, states are preparing for the possible impact that any new requirements may have on water systems.

New Hampshire Makes Headway

New Hampshire's Ed Betz, engineer and superintendent for the town of Littleton, said the state has held statewide meetings and hopes to make DWSRF monies available by spring of 1998.

"We're now in the rule-making process," he said, adding that the state is seeking EPA approval. "We've begun the preapplication process and are

encouraging water systems to submit letters of interest so we can get our priority list together."

As far as small system capacity, Betz said the state still has much work to do. "New Hampshire saw a lot of growth in private systems in the 1980s. Those systems are now in trouble," he said. "Often they aren't operated very well, and many are now in financial distress. But I'm not sure what the state will do to alleviate these problems."

Current microbial and disinfection byproduct rules will also be changing within the state, said Betz. "We'll soon be testing for *Cryptosporidium* in the watershed. And we expect final EPA regulation to be in place by November 1998."

But Betz also expressed some concern over these new regulations. "Regulations for maximum turbidity levels will probably end up at less than 0.3 nephelometric turbidity units (NTUs) 95 percent of the time measured every four hours," he said. "We may have some trouble meeting those requirements."

However, Betz doesn't think that operator error will be much of a concern statewide. "New Hampshire already has a pretty rigorous operator certification in place," he said. "I don't expect to see much change in the current program."

Pennsylvania Revamps Certification

Pennsylvania plans to revamp its operator certification program, said Matt Milliron, community water system program coordinator for the Centre County government. "The state's department of environmental protection thinks they won't see any significant changes until next year. They are currently working toward requiring continuing education units.

"They're still working on getting the set-aside funds together for the operator certification program and other drinking water programs. They're also trying to decide who will administer the program.

"They already have a source water protection program in place, and I'm not certain if the program will go through any changes," he concluded.

Idaho Continues Toward Goals

Idaho legislators are still in the working stages of its drinking water programs, said Steve Tanner, program supervisor of Idaho's Division of Environmental Quality (DEQ) in Coeur d'Alene's regional office. "We haven't done much toward operator certification yet. And our DWSRF program isn't quite ready, although we're hoping to be making loans by August."

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"The state has done much of the preliminary work toward meeting new SDWA requirements," said Tom John, water quality analyst, Idaho DEQ. We've held several open discussions to solicit ideas for meeting some of the new regulations. Operator certification is not mandatory in Idaho at this time, but we do have strong voluntary certification standards that will probably meet or exceed EPA's guidelines."

"Source water protection has seen some activity, but don't expect to move much until the guidance from EPA is finalized.

"We've worked with the Environmental Finance Center at Boise State University to develop an assessment tool to determine capacity for systems that want to apply for DWSRF loans. We expect to use what we learn from using this tool as a starting point for putting together a small systems capacity development strategy.

"It is likely to be a couple of years before anything is final, though," he added. "We'll have to put together a legal framework. We have the authority to set up a mandatory operator certification program, but will probably need to add to our drinking water rules to spell out how we will prevent new, non-viable systems from coming into play."

Oklahoma Continues To Organize

Oklahoma is spending much of its time organizing its DWSRF program, said Gene Whatley, director of the Oklahoma Rural Water Association (ORWA). "We held a public hearing May 15. We have the priority list prepared, and now we're waiting for EPA approval.

"We've had a fairly aggressive operator certification program in place for years, so there's really nothing new. We are waiting to see what EPA will say, however.

"Oklahoma's Department of Environmental Quality (DEQ) plans to develop a model press release for systems to use as a guide for the public notification requirement. The National Rural Water Association and the state's DEQ are taking the reins here.

"ORWA has been talking with the state about working with communities on a source water protection program," Whatley continued. "The state has had a groundwater program in place for four years. I expect the source water program to be similar.

"Viability is a big issue in Oklahoma," he said. "We're looking at putting a person in the field to work with systems so they will be able to understand what it is they need to do to become more viable—something similar to our circuit rider program. This program will be in connection with DWSRFs."

For more information about the reauthorized SDWA, view EPA's Web site at <http://www.epa.gov/OGWDW/sdwa/sdwa.html>.

For a summary of the SDWA, call (800) 624-8301 or (304) 293-4191, and order On Tap's special SDWA reauthorization issue, Winter 1996, Vol. 5, Issue 4.

For more information on small system capacity, request a copy of the special capacity development issue of On Tap, Summer 1997, Volume 6, Issue 2. ■

Water Tasting: Toast to the Tap Sparkles

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coordinator for the National Drinking Water Clearinghouse (NDWC), judged at last year's contest.

"I don't think I really knew how different water can taste," Saxena said. "When you taste this many different waters as a judge, you begin to sense the differences in taste."

How do these contests help competitors?

"This kind of contest is valuable in that it really helps the producers of municipal waters to have their products taste tested," Saxena said. "It brings the people from the community out into the limelight, saying 'this is what we do to give you what you drink.' What other opportunity is there for a community to show off their water treatment people, to recognize them, and to display the water we drink and take for granted every day?"

This winter's seminar will once again be held at the Coolfont Resort and includes the director of a taste and smell clinic as a potential presenter. A new category has also been added, a packaging award for bottled waters sponsored by *Beverage Industry Magazine*.

A smaller scale water tasting contest is held each spring at the Lakeview Resort on Cheat Lake near Morgantown, West Virginia, where the NDWC is located. This past spring's competition, sponsored by the West Virginia division of the AWWA, drew 11 municipal water companies.

Applications for Toast to the Tap are available from Travel Berkeley Springs, 304 Fairfax Street, Berkeley Springs, WV 25411. The deadline for application to this winter's contest is December 15, 1997. For more information, call Rone at (800) 447-8797. ■

Water Fact



The average monthly water bill in the United States is \$15, ranging from a low of \$8 to a high of more than \$40.

*American Water Works Association
Blue Thumb
Campaign*



Students Prepare for Water Careers

by Michelle Moore
NDWC Contributing Writer

Children learn early to go to the sink and turn on the water for a drink. They don't question whether water will pour out of the tap. They, like the rest of us, simply take for granted that it will.

Bill McQueen of Response Marketing Group, a consulting firm in North Carolina, and a member of the National Rural Water Association (NRWA), knows well the importance of clean water. McQueen also noticed that the drinking water and wastewater industries lack women employees and that the professional staff is aging. He wondered how he and his colleagues could encourage young people to pursue careers in water management.

"The profession is growing more technical. Many in the business have worked into it backwards," McQueen said, explaining that many water professionals started their jobs before technology got so complex and have grown with the industry. Many of these professionals are nearing retirement now, and the field will be "wide open" for new people. But, McQueen said, unless children are educated about water quality and career opportunities in water technology, they might not become aware of the water industry as a potential profession.

Viewing the same subject from a different perspective, Mildred Dotson saw that some students need more from schooling than the standard classroom offers. Dotson is the executive director of Communities In Schools of Halifax and Northampton Counties Inc., a grassroots organization that recognizes students' occasional need for a different approach to learning. As a former teacher, she wanted to find a way for students to retain information better, as well as to help them find the self-respect that comes from doing a job well.

Through her own experience as a business owner supervising employees, Dotson learned how ill-prepared for work high school graduates can be. Not ill-prepared in terms of class work, she said, but what schools think businesses are looking for, and what skills prove useful for employees.

"I was looking at teaching and learning and wondered if maybe we do things backwards," Dotson said. "Why can't we just teach a subject without the name that turns them off, like algebra? You can scare kids to death by what you call something." She was convinced that students could learn, for example, algebra by relating the

concepts to real-life work instead of reading about them in a book and working problems.

'Rapid Tappers' Contest Sparks Idea

Dotson found her answer when she attended a NRWA conference on Hilton Head Island, South Carolina. Her husband works for Southern Corrosion, a company that maintains water tanks, and they invited her to attend sessions. In addition to informative conference sessions, Dotson witnessed something she had never seen before, a competition of "rapid tappers."

Teams from different municipalities competed in a timed event in which they hooked up new service lines for a hypothetical business or residence.

Dotson said she was really impressed with the teams and their supporters' enthusiasm for the competition. Co-

workers—from management to laborers—cheered the teams as they worked.

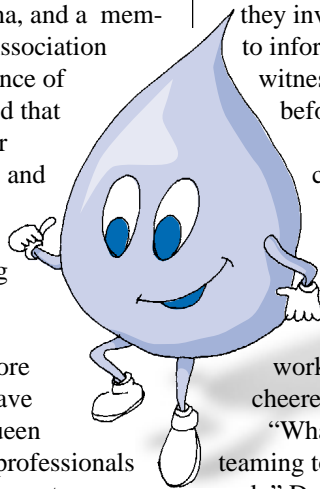
"What I saw were a lot of levels of positions teaming together in support of the guy doing the work," Dotson said. "I saw that the strength of the organization lies with those in the foundation. I saw pride and support of the team members, pride in their work, and pride in their success. It was the Superbowl of water tappers."

The experience of watching these workers compete inspired Dotson to incorporate the principles of "doing" into the classroom. She said she felt students could be instilled with the same enthusiasm for learning that they have for sports. She wanted students to feel a similar triumph at the completion of a lesson or a project. So she asked herself, "Why couldn't we build that same kind of feeling in high school students, with learning being relevant to real-life work that could be applied to real-life situations?"

A trend has developed in education, she said, a nationwide initiative for school-to-work curricula. "Many states have put their own spin on what they want [school-to-work] to look like, and Northampton's Communities in Schools idea was to encourage awareness of the water industry and to help students find jobs in their own communities."

Together, McQueen, his business partner Rob Montgomery, and Dotson brainstormed to develop a high school program in which students could learn about water management in a way that included working with local water facilities and establishing partnerships with businesses and existing local resources for a more hands-on approach to teaching. Their efforts paid off. The principal, teachers, parents, and students of

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Northampton County West High School all liked the focus on water.

A \$42,000 gender equity grant from the U.S. Department of Education through the North Carolina Department of Instruction made the program a reality. The Water Management/Water Related Careers (WM/WRC) program is for ninth through twelfth grade students. Its initial purpose was to provide incentive to female students who may not otherwise explore male-dominated industries, but WM/WRC is also open to male students.

Learning Experience Expands

The course was offered for the first time from January through May this year and 18 students participated. From the students' reports, the program was a success and they told McQueen they wish they had more classes like this.

McQueen said the program strives also to re-empower teachers by giving them the leeway to develop courses of study that provide both hands-on experience and a structured series of lessons for the students. As project technical advisor, McQueen provided teachers with The Water Sourcebook, a manual developed by Troy State University and Auburn University at Montgomery, Alabama, that outlines lesson plans with water as their central theme. The manual leads classes through activities designed to increase students' awareness of the environment and the nation's water supply. Water topics are used for a practical explanation to any problem, whether in English, math, science, or history. The book promotes the ethic "use what you need and don't pollute."

Dotson and McQueen both said students were encouraged to use their individual skills to enhance experiences in the class. One student designed a

logo that the class used on brochures, projects, and on their shirts worn for presentations. Another student had an interest in filmmaking, so he was put to work videotaping all of their presentations and field trips. Others with computer skills developed "Power Point" presentations with assistance from students with strong science and language arts backgrounds.

As part of their studies, the WM/WRC class spent time at the Champion Paper Company in Halifax County, near the high school. They learned how paper is made, how water is used in the process, and what happens to the water in the recycling process. They saw first-hand how water is made clean enough to be returned to its

source—in this case, the Roanoke River.

The class attended "Tools for Drinking Water Protection," a League of Women Voters National Satellite Conference that was down-linked to Halifax Community College in March. They sat alongside local officials, including the public health director, county water supervisor, and John Soles, director of North Carolina Rural Development, at a presentation for industry professionals. Dotson said experiences like

these help students "elevate expectations of themselves."

They also visited Roanoke Rapids Sanitary District water filtration plant, which serves more than 10,000 customers, and they created a display for water week that was exhibited in the local shopping mall. They used new skills learned in the class to educate their community about the importance of water.

A particular triumph for the students in the WM/WRC class was the experience of presenting the five-step Groundwater Wellhead Protection

Continued on page 10



Members of the Water Management Team of Northampton County West High School West attended the North Carolina Rural Water Technical Training Conference.

Students Prepare for Water Careers

Continued from page 9

Program to the Northampton County commissioners, which they completed for their own community of Garysburg.

They outlined the plan, which basically includes recognizing the problem and forming a planning team, delineating the area and identifying the drinking water source site and its radius, identifying any sources of contamination and preparing a plan to address the problems, adopting a wellhead protection plan, and creating a means of continuing to monitor the plan.

The class so impressed the commissioners that Northampton County adopted the wellhead protection program. This year's group initiated the wellhead protection program, then subsequent classes will learn the same procedure and repeat it to assure the community of a protected water source.

Learning Becomes Relevant

Dotson has a simple explanation for why these young people turned their educational experience around to become so positive. "When you're constantly informed you have value, you will perform like you have value," she said.

A strategy she likes to use with students in the WM/WRC class is to remind them repeatedly that they are working as professionals. She said she feels positive reinforcement achieves much more in helping them behave maturely than other methods sometimes used by teachers. Her goal is to help students succeed even though some of these students previously had problems with their schooling.

"Kids are environmentally aware today," Dotson said. "They love to give back to the

community and love to be responsible, and recognized for their achievements. We must instill honesty, integrity and reliability into their minds when they are very young and open to ideas. I know from what I've seen here that we can make children really excited about what they are learning.

"Where we live, there is no real industry," she continued. "What will kids in agricultural areas do for jobs in the 21st century? Agriculture doesn't require the manpower it used to, so people in rural communities often watch their children being educated to leave the area. But water is one of life's basic needs, though most people take it for granted. Those of us who live in rural areas are more conscious of the value of water. When the power goes off, we don't have it.

"Thinking in terms of small towns, each one has to figure its needs and implement how the residents will have clean water. The industry has all kinds of promotional material for educating the public. But we, in our communities, have to include our students in the plan, because it will be up to them to insure that we as a nation have a future that includes clean water."

Dotson said free information is available on education and science projects from many sources. And that scholarships are offered in environmental protection and industries associated with water management.

"School is a microcosm of the community, and the students are our future," McQueen said. "Schools have to buy into the concept of empowering the teachers, making learning relevant, and involving the community to make this a win, win, win situation for students, teachers, the water industry—everybody involved."

Dotson, who has decided to broaden her delivery of the water careers program, was recently hired as education specialist for Response Marketing Group. She can be contacted for more information at Rt. 4 Box 35 Littleton, NC 27850, (919) 586-5498.

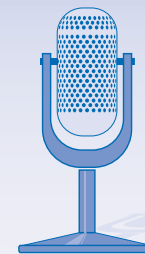
The National Drinking Water Clearinghouse has a 16-minute video that explores a variety of water-related professions available to lend to educators. Call (800) 624-8301 or (304) 293-4191 and request item #DWVTPE25.

The Environmental Protection Agency's (EPA) Web site has an educational page at www.epa.gov/OGWDW/kids/. ■

EPA Source Water Guidance for States Available

The U.S. Environmental Protection Agency (EPA) announced in August that the State Source Water Assessment and Protection Guidance is available. EPA provides this information so that states can implement source water protect provisions of the Safe Drinking Water Act Amendments of 1996.

For more information, a state contact list or copies of the guidance, call EPA's Safe Drinking Water Hotline at (800) 426-4791 or e-mail Hotline-SDWA@epamail.gov and request EPA 816-R-97-009. You may also access this information on the Internet at <http://www.epa.gov/OGWDW/>.



Water 2000: NRWA Suggests Assessment Plan

The National Rural Water Association (NRWA), an organization funded by the U.S. Department of Agriculture's Rural Utilities Service (RUS), provides advice and hands-on assistance to small drinking water systems. NRWA is composed of state rural water associations that provide circuit riders and assistance providers working at the grassroots level in each state—workers in a position to view progress in rural areas first hand.

How does this organization view the Water 2000 objective? Is running water in every home in the country possible by the year 2000?

According to Mike Keegan, policy analyst for the NRWA, whether or not Water 2000 is a viable program depends on two items: (1) money and (2) a simple common sense targeted program.

"In the 1996 Farm Bill, Congress included \$100 million for the Fund for Rural America that is supposed to benefit rural America through USDA programs," Keegan says, adding, "Drinking water and sewer improvements result in the greatest economic and public health benefits in rural communities. A small town's viability is directly related to its water supply, and drinking water quality is one of the most pressing public health concerns in rural America."

He comments that if the Water 2000 initiative is truly executed in accordance with its mission "it could provide a tremendous economic and public health improvement to rural populations that really need it." Keegan suggests that the best way to provide water to unserved and underserved rural families is a county-by-county approach.

"This is the approach that is closest to the grassroots and is just what we are urging the USDA to adopt." The idea is that assistance providers work with existing water systems to plan for system expansion in underserved areas, and then help them obtain funding assistance in order to implement the plans.

"The existing NRWA network should be the basis off which we expand and extend services," Keegan states. "This keeps the program from reinventing the wheel and also brings the surrounding local communities into the planning process. Local support is essential in making any drinking water infrastructure program a long-term success.

"This is important not only for public health, but to assure a base for future community economic stability," Keegan says. He also believes drinking water systems need this individual assistance so that they can meet primary drinking water standards under the Safe Drinking Water Act (SDWA), thus preventing costly sanctions against small communities. After the system is in place, good operations and maintenance are needed to keep the system healthy and in compliance.

"With this in mind, NRWA supports a major effort to carry out the county-by-county strategy proposed by the state rural water associations," Keegan states. He believes this effort in turn will result in an increase in the amount of funding from the SDWA—in the form of drinking water state revolving funds—and the U.S. Department of Housing and Urban Development (HUD) for these "unserved" areas.

"The RUS rural water and sewer grant and loan program has been the beacon that has led the way to a 90 percent reduction in the number of rural households without safe drinking water," Keegan notes. "It has been the wisdom, the common sense, and the support of Congress that has made this possible."

"For more information about the NRWA, call Keegan at (202) 955-3130 or e-mail keegan@ruralwater.org. You may also visit the NRWA Web site at <http://www.ruralwater.org>.

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"Drinking water and sewer improvements result in the greatest economic and public health benefits in rural communities."

■
*Mike Keegan,
policy analyst,
National Rural
Water Association*

NPTN Provides Information about Pesticides

Do recent reports on pesticides in drinking water worry you? The National Pesticide Telecommunications Network (NPTN), a cooperative effort of Oregon State University and the U.S. Environmental Protection Agency, is a service that provides information about pesticide-related subjects, including pesticide products, and toxicology and environmental chemistry.

NPTN is a source of factual chemical, health, and environmental information about more than 600 active pesticide ingredients incorporated into

more than 50,000 different products registered for use in this country since 1947.

For more information, call NPTN at (800) 858-7378 or access their Web site at <http://ace.orst.edu/info/nptn/>. You may e-mail them at nptn@ace.orst.edu. You may also mail written requests to NPTN, Agricultural Chemistry Extension, Oregon State University, 333 Weniger, Corvallis, OR 97331-6502 or send a fax to (541) 737-0761. ■

Water 2000: Millennium Approaches

Continued from page 1

USDA Assesses Need

In 1995, USDA conducted a state-by-state "Water 2000 Needs Assessment" that determined more than 2.4 million rural Americans—including 1.1 million rural Americans without indoor plumbing—have the most critical needs for safe, dependable drinking water. Another 5.6 million were identified as having additional serious needs under Safe Drinking Water Act (SDWA) requirements, including water pressure problems, a lack of adequate water storage facilities, and outdated distribution systems.

"Wells were too shallow and were being contaminated by farm runoff, pesticides, herbicides, etc.," Bart Handford, assistant to the administrator, Rural Utilities Service, told *On Tap* staff a year ago. "A lot of places didn't have water year round because their drinking water supplies or wells dried up. And many houses didn't have indoor plumbing—period." The assessment estimates that it will take approximately \$10 billion to address the needs in all 50 states.

Poor Water Quality Is Risky Business

The Centers for Disease Control and Prevention estimates that nearly a million Americans become sick each year from drinking contaminated water. Children and the elderly are disproportionately susceptible to these health risks.

On July 15, 1996, USDA Secretary Dan Glickman announced that USDA had selected and funded the 54 highest priority rural safe drinking water projects in 35 states. More than \$70 million was earmarked for these projects.

USDA invested more than \$1.3 billion in loans and grants for rural safe drinking water projects in 1995 and 1996.

A year ago, President Clinton highlighted the investment in safe drinking water as an integral part of his agenda for rural America—part of a commitment to investing in rural America to improve the quality of life, protect public health and safety, and foster economic sustainability. Good drinking water is essential to economic stability and growth. Without clean, dependable drinking water, a community has difficulty sustaining economic development or creating jobs through business expansions.

The need for Federal loans and grants that improve rural water systems far exceeds available funding. In fiscal year (FY)95, Water 2000 had a backlog of requests totaling \$2.9 billion for loans and \$1.2 billion for grants. For FY96, there was a backlog of nearly 1,000 applications for water loans and grants amounting to approximately \$2.7

billion. The president requested approximately \$840 million for additional rural water projects in his FY97 budget.

How is Water 2000 money being spent? How do the funds progress from abstract mission to practical application? In Minnesota and Iowa Assistance providers are using Water 2000 funds to extend distribution systems to hundreds of rural homes.

Minnesota Expands Service to 200 Farms

Red Rock Rural Water System has operated in a seven-county region including four small cities in Southwest/South-central Minnesota since 1985. The 1990 U.S. Census data indicates that the municipalities served have poverty level incomes and populations of fewer than 200 residents.

In the past 12 years, the area has experienced increased water consumption, due partly to farming needs. Drought conditions have added water demands to the system. Shallow farm wells in the area have been affected both by drought and pollution. Deeper wells are too costly and yield highly mineralized water with high levels of sulfates.

"Presently Red Rock Rural Water has 570 rural customers and four small communities on approximately 550 miles of pipeline," says John Baerg, director of Minnesota Rural Water Association, who also serves as director of Red Rock Rural Water System.

"We have three wells that produce 400 gallons per minute and a water treatment plant that removes iron and magnesium, and then adds chlorine and fluoride. Water is pumped to a 100,000 gallon elevated storage tank and then distributed via the pipeline system.

"We also buy a small quantity of water from a community. The Water 2000 monies of a little bit less than \$4 million will add 261 rural customers and two small communities with 250 miles of pipe. We are purchasing 75 million gallons of capacity for a new treatment plant being built in a neighboring town for the water supply. We will be adding a 500,000 gallon water tower also," he adds.

"My area of south central Minnesota, in some areas, has a problem obtaining water, and in other areas there is a quality problem," Baerg explains. "The quality is so poor that the farmers need to buy water for drinking and also for their livestock."

The project is estimated to cost \$4.9 million. USDA is providing a \$2 million loan and a \$1.9 million Water 2000 grant. The state of Minnesota and the City of Window provided additional funds.

Continued on next page

Water Fact



When you let water run for one minute, five gallons of water go down the drain.

American Water Works Association
Blue Thumb Campaign

New RUS Regulations Simplify Applications

The U.S. Department of Agriculture's Rural Utilities Service (RUS) has issued new regulations to streamline the application process for its water and waste disposal loans and grants, with an emphasis on reaching the neediest communities.

"The new regulations direct grant funds to the communities that need them the most," says Larry Bowman, chief of operations for RUS water and environmental programs.

The revised regulations, issued in June, eliminate preapplication from the process of applying for funds. The new procedures enable potential applicants, when they find it necessary, to get a determination of basic eligibility for funding prior to filing an application. "Applicants may make a written request to the agency for an eligibility determination without filing a full application," says Bowman. "We will respond in writing to the degree that sufficient information is available."

He adds that many applicants, particularly those who have had loans in the past, will not need to make a written request before applying.

A preliminary engineering report is still re-

quired with the application, as before. However, since there is no longer a preapplication to fill out, the preliminary engineering report will be needed sooner in the application process.

The new regulations revise slightly the process used to select projects for funding, to direct the funds toward small, low-income communities that need to correct health problems.

The new policies also include changes required by the 1996 Farm Bill, such as a requirement for the applicant to notify the public of the application and new guidelines for employing consulting engineers.

All RUS water and waste disposal loans and grants are processed and approved at state and local Rural Development offices. The funds may be used for drinking water systems, sanitary sewer systems, solid waste disposal facilities, and storm drainage systems.

For the phone number of your state Rural Development office, call the National Drinking Water Clearinghouse at (800) 624-8301 or (304) 293-4191. ■



Water 2000: Millennium Approaches

Continued from previous page

Iowa Project Serves Rural Residents

In Iowa's farmlands, safe drinking water has been one of the state's most precious resources; however, it has not necessarily been abundant. Iowa, a rural state, looked for a project that would serve as many people as possible with fresh drinking water.

Regional water systems seemed to be the answer to Iowa's prayers. And loan money through Water 2000 helped make it possible. "Iowa has received \$1.5 million," says Greg Huff, regional water project coordinator with Iowa Rural Water Association (IRWA). The Southern IRWA received \$750,000 in loan money and \$250,000 in grant funds. Rathbun Regional Water Association received \$500,000 in loan funds.

"IRWA is surveying the counties within the state to see what it would look like with regional water systems in place," says Huff. "We're currently 12 counties away from having that project complete. Iowa will be the first state to have its counties mapped out."

IRWA plans to use this information to help develop regional water systems across the state. Rathbun already serves approximately one-tenth of the state, says John Glenn, executive director, Rathbun Regional Water Association. "The total population we serve is close to 70,000. We've used the money we received to expand our water

plant. Having this low interest loan makes it financially feasible for us to make the improvements necessary.

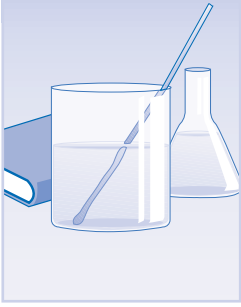
"We need to expand the system because population growth and the demand for water have risen considerably. We've just outgrown the water plant," says Glenn.

Rathbun's 6,000 miles of pipeline serve 26 towns. "Some of these towns could not meet SDWA requirements; some had no system at all," says Glenn. "And we'll be able to serve them much more economically with this system expansion."

For additional information about Water 2000, contact Bart Handford at RUS at (202) 720-1261. For the number of your state USDA Rural Development office, call the National Drinking Water Clearinghouse (NDWC) at (800) 624-8301 or (304) 293-4191.

For a Water 2000 needs assessment chart listing the number of U.S. households that need improved drinking water service and the estimated costs for delivering that service, call the NDWC at the above number and request item #DWFSRE09. For a free copy of Water 2000: A Plan for Action, request item #DWBLRE02.

See Spring 1996 On Tap 1996, Volume 5, Issue 1, page 1, and Fall 1996 On Tap, Volume 5, Issue 3, page 3 for further background information on Water 2000. ■



Is your job hazardous to your health?

Nothing is as important as safety, yet nothing is so easily overlooked in an emergency—especially if you haven't planned ahead. What are the primary risks in operating a drinking water plant? How can you protect yourself on the job?

An operator can encounter any number of dangerous situations around a plant; however, the most likely risks involve working in confined areas or trenches, repairing equipment, and chemical exposure, primarily to chlorine. Exposure to lead and asbestos is a possibility as well. Small system operators can be at particularly high risk for repair and trenching accidents since they so often work alone.

Learn your risks and protect yourself.

Small System Guide to Risk Management and Safety

Community Resource Group's *Small System Guide to Risk Management and Safety* is a free, skills-based workbook that instructs small utility management personnel on how to reduce potential losses by identifying risks, setting policies and standards, and providing guidelines for corrective action. Checklists, diagrams, tables, sample policy statements, and types of safety training for employees are included to tailor the recommendations for a particular workplace.

Information concerning issues from board member liability and traffic control, to electrical

safety and wrongful termination of employees, is provided and is applicable to all states.

To order a copy of *Small System Guide to Risk Management and Safety*, contact *South Central RCAP, Community Resource Group, Inc.*, P.O. Box 1543, Fayetteville, AR 72702. You may also call them at (501) 443-2700 or fax to (501) 443-5036.

Cave-in Protection and Competent Person Training Manual

This technical short course consists of a student manual, instructor's guide, and audiovisual aids designed to teach the skills needed to become a "competent person," in this case, one who is responsible for safe excavation or trenching activities. Included are keywords and learning objectives needed to comply with regulations, reduce employee risk, develop safety procedures, protect the public, and reduce liability exposure. The student manual provides step-by-step application of Occupational Safety and Health Administration (OSHA) regulations for the "competent person."

The package costs \$28. To order, contact *ACR Publications*, 1298 Elm St. SW, Albany, OR 97321 at (541) 928-6199. You may also fax your request to (541) 926-3478. ■

ASSE Offers Safety Information

The American Society of Safety Engineers (ASSE) offers a number of publications dealing with safety issues.

Directory of Safety Related Computer Resources

This 404-page directory provides more than 900 of the latest safety and health-related products, hardware and software, including product listings for environmental compliance tools, engineer education and training, and business management and administration.

Grounding Safety

Improper grounding is the most often cited Occupational Health and Safety Administration violation because even electrical engineers and electricians often have difficulty fully understanding grounding installations. This 16-page booklet explains the process in clear, concise language.

Safety Engineering, Second Edition

This revised and updated edition is widely used in college safety engineering classes. It addresses every major facet of safety engineering including work place hazards, establishing and implementing strong safety attitudes, and managing the workplace environment.

For more information or to order the above publications, write to ASSE, Dept. F, 1800 East Oakton St., Des Plaines, IL 60018-2187. You may also fax to (847) 768-3434 or call (847) 699-2929. The shipping charge for a single publication costing up to \$34.99 is \$4.

Directory of Safety Related Computer Resources, order #4351, costs \$19.95 for members; nonmember price is \$24.95. Grounding Safety, order #4354, costs \$4.95 for members and \$6.95 for nonmembers. Discounts are available for quantity orders.

Safety Engineering, Second Edition, a 435-page soft-bound publication, order #4352, costs \$27.95 for members and \$34.50 for nonmembers. ■

AWWA Provides Safety Information

The American Water Works Association (AWWA) has developed a number of safety publications, including videos with corresponding participant guides.

AWWA 1996 Safety Talks

This series of 52 lectures on common water utility safety practices is designed to encourage dialog on safety topics. The AWWA bills these informal five- to 10-minute lectures as great discussion starters.

Safety Practices for Water Utilities

This 160-page soft bound book is an excellent resource for developing and implementing a water utility safety program. Written for all levels of utility personnel, the book includes dozens of creative ideas for educating and training employees on the importance of safety in the workplace. A comprehensive subject index is included for easy reference.

Chlorine Safety

This 22-minute AWWA video explains the dangers of chlorine, including chemical properties, safe containers, proper storage, and emergency procedures.

The Five S's of Excavation Safety

This 15-minute AWWA video presents the five S's: Safety, Soils, Sloping, Shoring, and Shielding

and explains the importance of each during excavations. It also presents the complex Occupational Safety and Health Administration standards on excavation safety.

Electrical Safety

This 28-minute video produced by Tel-A-Train, Inc. explains how most electrical accidents happen.

AWWA 1996 Safety Talks, order #70110, retails for \$30; member price \$19, if order one to five copies.

Safety Practices for Water Utilities, order #30003, retails for \$55; member price is \$35.

Chlorine Safety, item #65017 retails for \$175; AWWA member price is \$115.

The Chlorine Safety Participant Guide, item #65016, a 36-page booklet, retails for \$6; AWWA member price is \$4.

The Five S's of Excavation Safety, item #65006, retails for \$175; the AWWA member price is \$115. The accompanying participant guide, item #65007, retails for \$6; AWWA member price is \$4.

Electrical Safety, item #65002, has a member-only price of \$140.

For more information or to order the above products, contact the AWWA at (800) 926-7337 or fax your request to (303) 347-0804. You may also write to them at 6666 W. Quincy Ave., Denver, CO 80235. ■

OSHA Suggests Safety and Health Sites

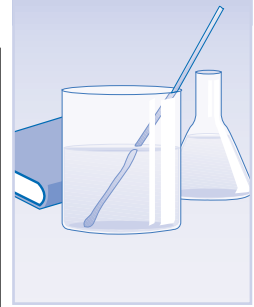
The Occupational Safety & Health Administration (OSHA) is the division of the Department of Labor created to protect America's workers. Its mission is to save lives, protect health, and prevent injuries and illnesses. OSHA was created in 1970 to "assure so far as possible every working man and woman in the nation safe and healthful working conditions."

For more information about OSHA, see its home page at <http://www.osha.gov/>. For a list of states and territories with approved OSHA plans and the state contacts, go to <http://www.osha.gov/oshdir/states.htm>.

OSHA provides a list of health and safety-related links at <http://www.osha.gov/safelinks.html>. OSHA's disclaimer states that it is not affiliated with these organizations, nor is it responsible for the content of the information provided. Among the links are:

- American Society of Safety Engineers <http://www.ASSE.org/>
- CDC (Centers for Disease Control and Prevention) <http://www.cdc.gov>

- Duke University Occupational & Environmental Medicine <http://occ-env-med.mc.duke.edu/oem>
- Ergo Web <http://www.ergoweb.com>
- MSU Radiation, Chemical & Biological Safety <http://www.orcbs.msu.edu>
- National Institutes of Health <http://www.nih.gov>
- NIOSH (National Institute for Occupational Safety and Health) <http://www.cdc.gov/niosh/homepage.html>
- Pan American Health Organization <http://www.paho.org/>
- Rocky Mountain Center for Occupational and Environmental Health <http://rocky.utah.edu>
- Trench Safety, A Tutorial for Constructors <http://www.bsc.auburn.edu/>
- University of California, Irvine Health Promotion Center <http://www.socecol.uci.edu/~socecol/depart/research/hpc/hpc.html>
- University of Iowa Institute for Rural and Environmental Health <http://info.pmei.uiowa.edu> ■





What about extruded carbon filters?

What is extruded carbon?

Carbon extrusion refers to the process by which activated carbon is manufactured. In general, activated carbon powder is combined with thermoplastic binder, adsorbents such as zeolite, and extruded to form a uniform and highly porous finished product. The extrusion process can be controlled to fit various adsorption needs and treatment specifications.

How does it work?

As an activated carbon, extruded carbon treats drinking water by trapping impurities in a solid-liquid interface that envelops the surface area of the carbon pores. Similar to granular activated carbon (GAC) and powdered organic carbon, extruded carbon can treat for taste, odor, color, and volatile organic carbons (VOCs), as well as most synthetic organic carbons (SOCs). In addition, extruded carbons can be used as microfilters to trap particles as small as 0.5 micrometers (μm) making it suitable for cyst reduction and 100 percent removal of *Cryptosporidium* and *Giardia lamblia*.

Extruded carbon type products are applied as point-of-use devices. The product comes in the form of small cartridges 5–20 inches in length, 2.5–5 inches in diameter and could treat up to 7 gallons per minute (GPM) of flow rate.

What are the advantages?

- Extruded carbon does not release carbon powder during start-up as some GAC does. Released carbon particles contribute to

coloration of water, contamination, and long-term plumbing problems.

- Due to its rigid structure and high strength, extruded carbon does not fluidize or form channels that may cause contaminants to bypass the sorbent-free zones. In addition, extruded carbon can withstand high pressure and clogging capacity without causing blowout.
- In extruded carbon, the untreated water moves through a shorter distance at a lesser speed than in some GAC, minimizing the pressure drop while maintaining the same contact time and treatment quality.
- The carbon extrusion process is controlled to fit various adsorption needs and treatment specifications. The process could be controlled to form carbon microfilters capable of removing cysts, lead and Class 1 particulates in addition to removing VOCs, trihalomethanes (THMs), Class 1 chlorine, taste, and odor. In addition, two extrusion processes can be combined into one filter composite of two different pore sizes. For example, a composite of micropores and macropore-sized carbon mesh could be used to adsorb smaller molecules, such as THMs and VOCs and larger molecules like tannins respectively.
- Extruded carbon requires less binding material than GAC minimizing carbon fouling and maximizing the porosity as well as the dirt holding capacity of the carbon filter.

Does chlorine kill *Giardia*?

Giardia lamblia, a tiny waterborne parasite or protozoan that causes stomach cramps, bloating, and diarrhea, is inactivated by a combination of filtration and disinfection.

Filtration, as stated in the Surface Water Treatment Rule (SWTR), must be used *unless* the criteria concerning source water quality, disinfection, watershed control, absence of waterborne disease outbreaks, onsite inspection, and compliance with maximum contaminant levels are met.

An important component of the criteria for avoiding filtration is meeting specified CXT values for inactivation of *Giardia* and viruses. The CXT value is the concentration of disinfectant residual (C) multiplied by (X) the time (T) the water is in contact with the disinfectant. Water systems that use a surface water source or groundwater under the direct influence of surface water and that do not filter must calculate the CXT value each day water is served to their customers. The calculated values must meet the levels specified in the SWTR. *The effectiveness of disinfectants differs. Consequently, CXT values required depend on the disinfectant used.*

What are the disadvantages?

- As with GAC and other activated carbon devices, extruded carbon does not prevent pathogenic buildup. Therefore, the treatment should be applied in combination with other disinfection methods. There are products on the market that use extruded carbon in combination with an ion exchange treatment method in order to remove other organics (e.g., The Countertop System by The Embassy Water Resources).
- Extruded carbon is more expensive than other ordinary activated carbon products due to its unique manufacturing process.
- Extruded carbon cannot remove radioactive contaminants as efficiently as aeration methods can.
- To minimize the potential of clogging and prolong its life span, extruded carbon finished products should be applied to treated water.



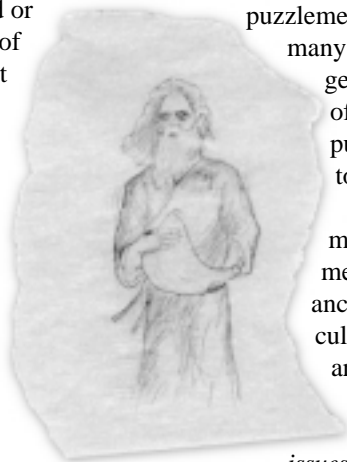
History Repeats Itself

Search for Pure Drinking Water Continues

Safe drinking water is one of the elements most crucial to human survival. And throughout history, people have tried one method or another to ensure a fresh, tasty drink of water. To illustrate humankind's thirst for pure water, *On Tap* published a three-part series about the history of water treatment and waterborne diseases that ran in the Summer 1996, Fall 1996, and Spring 1997 issues.

The first installment looks at our quest for clean water from ancient times to present, using various treatment methods. From the first known clarifying device pictured on the tombs of ancient Egyptian kings to modern rapid sand filters, the article illustrates our need for clean water.

The second installment discusses waterborne diseases, our efforts to find their causes, and our



realization that contaminated water can make us more than just a little ill. The article traces the puzzlement we faced in finding out why so many people in the same area were getting sick, to our understanding of the cause, and how we finally put proper sanitation methods to use.

The final installment looks at modern drinking water treatment methods and how they sprang from ancient wisdom. Coagulation, flocculation, sedimentation, filtration, and disinfection are all discussed in this article.

To order any of these free back issues of On Tap, call the National

Drinking Water Clearinghouse at (800) 624-8301 or (304) 293-4191. Actual shipping charges are added to orders.

NDWC's New Products Catalog Is Available

The National Drinking Water Clearinghouse (NDWC) has just published a new version of its products catalog, which describes nearly 200 free or low-cost products that address small community drinking water issues.

Available at no charge, the *Drinking Water Products Catalog* includes items that detail drinking water system finances, management, regulations, operations and maintenance, public education, and the health effects of contaminants.

The guide contains a brief explanation of each product, lists the organization that developed it,

the year it was developed, the cost, and a product number. An index by key word is provided for easy reference.

To request a hard copy of the catalog, call the NDWC at (800) 624-8301 or (304) 293-4191. You also may request a copy via e-mail at ndwc_orders@ndwc.wvu.edu. An electronic version of the guide may be accessed on NDWC's Web site at <http://www.ndwc.wvu.edu>. ■

Popular Training Resources Catalog Available

If you are involved in training others in your water system, it's likely you'll find the latest issue of the *1997 Environmental Training Resources Catalog for Small Communities* a good way to locate quality materials.

Compiled by the National Environmental Training Center for Small Communities (NETCSC), a "sister organization" to the National Drinking Water Clearinghouse, the catalog contains more than 150 reviews of products useful in drinking water, wastewater, and solid waste training. It also includes adult education resources. Each review covers a product's content, how it can be used, its cost, and availability.

More than 30 reviews focus on drinking water training items, including titles, such as

Groundwater and Wellhead Protection, Pumps and Pumping, Practical Personnel Management for Small Systems, Water Treatment Principles and Design, and Water Treatment Troubleshooting and Problem Solving.

"Trainers and technical assistance providers are always looking for more items to add to their collection of training materials," says Sherry Swint, NETCSC training resources specialist. "This catalog gives them information about products to help them make informed purchase decisions."

To receive your free copy of the catalog, call NETCSC at (800) 624-8301 or (304) 293-4191 or fax your request to (304) 293-3161. Ask for item #TRBKPR11. ■



Book Outlines Drinking Water Issues

The Sierra Club Guide to Safe Drinking Water by environmental writer Scott Alan Lewis offers an easy to read and understand guide to drinking water issues facing the U.S. population. The book also proposes some thought-provoking challenges to those working in water quality facilities.

Chapters cover a range of topics including potential contaminants and their effects, basic quality standards and how they are enforced, water treatment costs to the community, and what additional steps might be taken to improve the quality of drinking water coming from taps around the country.

While Lewis' book may not be technical enough for career drinking water personnel, educators may find the book helpful for introductory staff training and in advocating safe drinking water measures to the general public.

Lewis' message is not entirely complimentary to the U.S. Environmental Protection Agency (EPA), who he claims is not adequately fulfilling the promise to help provide clean drinking water to U.S. citizens. He asserts that for approximately \$30 more per household per year, clean water could be the standard for all, but Lewis also

concedes that "purification needs vary from system to system."

The book includes 1992-93 ratings of 200 municipal water systems, citing violations and contaminants, and includes a list of cities with no reported violations in 1993-94. And for those discouraged by stories of toxic substances in public water, Lewis rates home filtering systems.

The Sierra Club Guide to Safe Drinking Water reminds readers that water treatment can always be improved upon and that water treatment professionals must never become content with their efforts to provide cleaner, safer drinking water to the public.

For more environmental information, visit the Sierra Club home page at <http://www.sierraclub.org/>. To order *The Sierra Club Guide to Safe Drinking Water*, call the Sierra Club Bookstore at (415) 977-5500 or e-mail them at online.store@sierraclub.org. You may also write to Sierra Club Books, 85 Second St., Second Floor, San Francisco, CA 94105-3441 or fax requests to (415) 977-5799. The 120-page book costs \$10 and includes 16 tables and appendices. There is a \$4 shipping charge. ■

NDWC Web Site Now Includes Online Ordering

To make it easier for users to access its services, the National Drinking Water Clearinghouse (NDWC) recently redesigned its Web site and now includes e-mail ordering for products and online access to its "Tech Brief" fact sheets.

Located at <http://www.ndwc.wvu.edu>, the site contains an overview of the NDWC program and its services, a public education section called "Water Facts," and links to other relevant sites. It also provides online access to the program's newsletters, *On Tap* and *Water Sense*, and to its new product catalog. (See article on previous page.)

The NDWC Tech Briefs are four-page fact sheets that provide concise technical information about drinking water treatment technologies relevant to small systems. Five fact sheets have

been developed and address disinfection, filtration, corrosion control, ion exchange and demineralization, and organics removal.

These Tech Briefs and all of the NDWC's products may be ordered via the site's new e-mail link at ndwc_orders@estd.wvu.edu.

Future plans for the site include online discussion groups that address drinking water topics. These discussion groups will be monitored by NDWC staff to ensure accurate information is being conveyed. A calendar of drinking water-related events will soon be added as well.

For more information about the Web site, call the NDWC at (800) 624-8301 or (304) 293-4191. ■

The Groundwater Foundation Primes Pump

The Groundwater Foundation will hold its "Priming the Pump" groundwater education workshop and annual Groundwater Guardian Designation Conference November 22-24, at McDonald's Corporation's Hamburger University in Oak Brook, Illinois. The theme this year is "Joining Forces: Education and Action for Groundwater."

Groundwater Guardian is a national program that supports, recognizes, and connects community

teams taking "voluntary, pro-active" steps toward groundwater protection.

For further information, contact Susan Seacrest at The Groundwater Foundation, P.O. Box 22558, Lincoln, NE 68542-2558; call (800) 854-4844 or (402) 434-2740; or fax (402) 434-2742. You may also send an e-mail to info@groundwater.org or view the Foundation's Web site at www.groundwater.org. ■

NRWA plans "Adventure in Indiana"

Rural and small community water and wastewater professionals are invited to attend the National Rural Water Association's (NRWA) 1997 management and technical conference, "Adventure in Indiana."

Educational workshops and exhibits will offer the latest information and technology to more than 2,100 members expected to converge on the

RCA Dome Convention Center in Indianapolis, September 28–October 1.

The NRWA and its affiliated state rural water associations is the largest utility organization in the U.S. with more than 17,000 members.

For more information or to register, call the NRWA headquarters in Duncan, OK, at (405) 252-0629. ■



ASDWA Conference Convenes in Savannah

The Association of State Drinking Water Administrators (ASDWA), a professional association serving state drinking water programs, will hold its 12th annual conference in Savannah, Georgia, October 20–23, 1997.

Conference attendees include state drinking water program administrators and their staff, U.S. Environmental Protection Agency personnel, and industry group representatives.

For more information or to register for the conference, call ASDWA at (202) 293-7655 or e-mail them at asdwa@erols.com. You may also write them at 1120 Connecticut Ave., NW, Suite 1060, Washington, DC 20036 or fax to (202) 293-7656. Also, ASDWA is now on the Internet. Visit their Web site at <http://www.asdwa.org>. ■

Speaking of Networks...

IWRN Connects Western Hemisphere

Communication between water resource specialists and managers throughout the western hemisphere is easier since the formation of the Inter-American Water Resources Network (IWRN).

IWRN provides a means of collaborating for individuals and groups committed to proper management of water resources in the Americas.

The network was formed in 1993 when 400 water professionals and water policy makers met in Miami, Florida, to discuss the importance of sustainable development and integrated water resource management. Their goal was to "find ways for water policy-makers, water managers, educators, researchers, and members of non-governmental organizations to develop and enhance their internal and external communications and cooperative ventures and to support sustainable development and integrated management of water resources worldwide."

IWRN offers a variety of forums for environmental information exchange and technical cooperation. Among them is "Dialog-Agua-L" started in June 1995 to aid in sharing water information, technology, and expertise via the Internet.

To subscribe to Dialog-Agua-L, send an e-mail message to listserv@centauri.ces.fau.edu. Leave

the subject line blank. The message should read: sub dialog-agua-L <first name last name.>

Postings to Dialog-Agua-L in all languages from countries in the Organization of American States are welcome.

IWRN publishes a newsletter, *Dialogue Update*, three times a year. They also maintain a Web site at <http://www.oas.org/L/iwrn.htm> that provides frequently updated information about activities, minutes of advisory council meetings, and back issues of *Dialogue Update*. The Web site also has links to related sites.

Current objectives of the IWRN include expanding membership; completing directories of water agencies, networks, and other sources of water information; and funding several projects in Latin America and the Caribbean that demonstrate partnering between members.

For more information, contact Inter-American Water Resources Network Technical Secretariat, c/o Unit of Sustainable Development and Environment, Organization of American States, 1889 F. St., N.W., Room 340, Washington, DC 20006. You may also phone them at (202) 458-3556, fax (202) 458-3560, or e-mail regional_development@oas.org.

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On Tap is printed on
recycled paper.

NDWC Offers New Drinking Water Products

Note: The free items listed below are limited to one of each per order. Call (800) 624-8301 or (304) 293-4191 to order products or order via e-mail at ndwc_orders@estd.wvu.edu. Please allow three to four weeks for delivery. Actual shipping charges are added to each order.

■ **Cleaner Water Through Conservation**

Item #DWBKPE53

This U.S. Environmental Protection Agency book discusses how excessive water use affects water quality. It provides information on how to conserve water.

Cost: \$0.00

■ **Drinking Water Regulations and Health Advisories**

Item #DWBLRG44

This U.S. Environmental Protection Agency booklet provides drinking water standards and health advisories for numerous organics, inorganics, and certain radionuclides. The standards are presented for the Maximum Contaminant Level and the Maximum Contaminant Level Goals. The health advisories are presented for both children and adults in terms of maximum dose that a person can be exposed to, and the cancer group of each chemical.

Cost: \$0.00

■ **Methods for Assessing Small Water System Capability: A Review of Current Techniques and Approaches**

Item #DWBLTR13

This U.S. Environmental Protection Agency manual was developed to help states understand and apply available methods for assessing water system capacity. It addresses small systems capabilities, provides examples of assessment

methods, and explains system-level viability assessments.

Cost: \$0.00

■ **Water Testing**

Item #DWBLPE58

This booklet developed by The Ohio State University explains water testing and treatment for households that depend on their own well, spring, or cistern for drinking water. Information about choosing water tests, collecting water samples, and receiving test results is provided.

Cost: \$0.00

■ **Shock Chlorination of Wells and Springs**

Item #DWBL0M05

This booklet developed by The Ohio State University explains how shock chlorination can clean and sanitize a drinking water well or spring contaminated with bacteria. A table is provided to determine the amount of chlorine needed, and directions show how the chlorine should be applied.

Cost: \$0.00

■ **Emergency Disinfection of Water Supplies**

Item #DWFSPE57

This fact sheet developed by The Ohio State University provides tips about how to ensure you don't get sick from drinking contaminated water when traveling or camping.

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.

National Drinking Water Clearinghouse

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