Running Your System Like a Business
Eighteen months ago, we introduced you to Trucker Mike, a long-haul driver with a passion for photographing water towers. We’re pleased to report that Trucker Mike is still traveling America’s highways and byways, and he’s still taking pictures of water towers. The photos on the inside covers of this On Tap are by Trucker Mike. To view more of his work, go to www.mikiemetric.cc/WaterTowers.html.
Features

24 Proper Rates are Critical for Financial Health

28 Water System Management Training in Mississippi

32 How do we keep the employees?

38 Making Sure it all Adds Up: Financial Accounting for Small Systems

41 Asset Management from Theory to Reality

43 Tact Helps You Collect What’s Past Due

46 Insurance for Water Utilities

50 Internal Control for Small Water Systems

52 Keeping Records: How long is enough?

Cover Story

Running Your System Like a Good Business

18 Proper planning and budgeting are two of the best things a system can do to ensure a bright future.

In Every Issue

6 Calendar of Events

7 News and Notes

12 On the Web

14 Ask the Experts

57 Featured Products

58 Products List

64 Fun Time

66 Until Next Time

Tear Out Insert

Tech Brief • Meters

This Tech Brief discusses the different types of meters, their applications, and their importance for a water utility.

Original cover art by graphic designer and illustrator, Kairi Frame.
For several years now, we’ve heard about the importance of running small community utilities more like businesses. The U.S. Environmental Protection Agency made it a component of capacity development efforts begun in the 1990s, and the U.S. Department of Agriculture’s Rural Utilities Service (RUS) has encouraged business ideas and methods in the communities they serve.

“Good business practices are essential to the growth and development of water and wastewater systems across rural America,” says Hilda Gay Legg, RUS administrator. “Realistic operating budgets, reasonable user rates, and planning for depreciation of short-lived assets are important elements to a successful financial operation. Rural Development’s utility programs are committed to the future of water and wastewater systems. As part of that commitment, we assist rural communities in finding ways to achieve sound business practices that will enable them to finance improvements and extensions while emphasizing local responsibility.

“We further extend our commitment to rural communities through partnerships with organizations such as the National Environmental Services Center (NESC),” Legg continues. “They provide invaluable free information to rural leaders across the country to achieve these objectives. Through On Tap and numerous additional sources of information, NESC assists rural communities in improving the operation of their water and wastewater systems.”

Water Is Business

Of course, saying you should run your system like a good business is a whole lot easier than doing it. In this On Tap, you’ll find a series of articles—from accounting to training—designed to make it easier for you to take business ideas and put them to work in your community.

There are numerous topics we could have pursued with this theme but, frankly, we ran out of room. So, you will find six additional articles plus several worksheets on our Web site (www.nesc.wvu.edu—click on the On Tap link under publications). Look for our On Tap Online logo in articles where additional information is available on the Web.
This theme issue is the result of a year's worth of discussion and planning. At 72 pages, it's the largest On Tap we've ever published. We're pleased with how it turned out and hope that it is useful to you in the work you do.

Is that a new name?

Eagle-eyed readers will notice that the National Drinking Water Clearinghouse (NDWC) name has disappeared from On Tap, replaced with references to the National Environmental Services Center (NESC). Did we change our name?

The answer is: yes and no. The NDWC has, for many years, been part of NESC, along with programs devoted to wastewater, environmental training, alternative technologies, and community demonstrations. When we surveyed our stakeholders, though, we found that most were not aware that NDWC had national partners offering these other services. And among those people who were familiar with our partners, there was considerable confusion over which program performed which service.

We decided, therefore, that we would begin to talk about all of our services with one identifying name: NESC. We think this provides better access to all of our valuable information and community services while, at the same time, being easier to remember.

We're proud of what we've accomplished with the National Drinking Water Clearinghouse and with the contribution NDWC has made to the broad spectrum of services available through its partner organizations. With NESC, we guarantee that you will not only get everything you've come to expect from us—technical assistance, Web site, free and low-cost products, and On Tap magazine—but much more, because you'll have easy access to an even wider variety of information and services important to managing water and wastewater services. To learn more about NESC, please visit our Web site or contact us. We are confident these changes will serve you and America's small communities even better.

With warm regards,

Rick Phalunas
Managing Director
National Environmental Services Center
If you are sponsoring a water-related event and want to have it listed in this calendar, please send information to Lori Stephens, National Environmental Services Center, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. You also may call Lori at (800) 624-8301 or (304) 293-4191 ext. 5522 or e-mail her at Lorri.Stephens@mail.wvu.edu.

**Calendar of Events**

### September

**National Association of Towns and Townships’ Annual Conference**
September 8–10, 2004
Hyatt Capitol Hill
Washington, DC
Contact: Sharon Blanchard
Phone: (202) 624-3555
www.natat.org

### Association of State Drinking Water Administrators’ Annual Conference and Exposition**
October 4–7, 2004
Hyatt Regency on Town Lake
Austin, TX
Contact: Tom Maves
Phone: (202) 293-7655
Fax: (202) 293-7656
www.asdwa.org

### October

**Water Environment Federation**
WEFTEC ’04
October 2–6, 2004
Ernest N. Morial Convention Center
New Orleans, LA
Phone: (800) 666-0206 or (703) 684-2452
Fax: (703) 684-2492
www.weftec.org

**56th National Rural Water Association’s Annual Conference and Exposition**
October 10–13, 2004
Biloxi, MS
Contact: Dawn Meyers
Phone: (580) 255-0629
Fax: (580) 255-4476
www.nrwa.org

### November

**Groundwater Foundation Annual Groundwater Conference**
November 3–6, 2004
Wyndham Hotel
Washington, DC
Contact: Zoe McManaman
Phone: (800) 858-4844 or (402) 434-2742
www.groundwater.org

### December

**National Ground Water Association’s Annual Conference**
December 12–15, 2004
Las Vegas Convention Center
Las Vegas, NV
Contact: Kathy Butcher
Phone: (800) 551-7379 or (614) 898-7786
www.ngwa.org

---

### On Tap

Order yours today, it’s Free!

That’s right, it costs absolutely nothing to get On Tap. Why not sign up and have the magazine delivered to your door four times a year?

To order On Tap just call us toll free at (800) 624-8301, send an e-mail to info@mail.nesc.wvu.edu, or write to National Environmental Services Center, West Virginia University, P.O. Box 6064, Morgantown WV, 26506.
Endangered Rivers List Released

American Rivers, a river conservation group, released its 2004 report about the most endangered rivers in the U.S. in April. According to this year’s report, a failure of the federal government to create a credible plan to protect the nation’s waterways is accelerating a trend toward more polluted rivers nationwide.

American Rivers says the ten most endangered waterways are:
1. Colorado River (Colorado, Utah, Arizona, Nevada, California)
2. Big Sunflower River (Mississippi)
4. Tennessee River (Tennessee, Alabama, Mississippi, Kentucky)
5. Allegheny and Monongahela Rivers (West Virginia, Pennsylvania, New York)
7. Housatonic River (Massachusetts, Connecticut)
8. Peace River (Florida)
9. Big Darby Creek (Ohio)

The rivers on this year’s list are not necessarily the most polluted rivers in the nation, the report said. Rather, they face the most uncertain futures because toxic chemicals, water shortages, and other serious problems loom if the federal government continues cutting provisions that safeguard clean water.

“The rivers on this year’s list face particularly dire futures, but they are not unique,” said Rebecca R. Wodder, president of American Rivers. “They are poster children for a nationwide trend toward polluted waters and less effort to clean them up.”

The report found that following passage of the Clean Water Act in 1972, America’s waters became progressively cleaner. In 2000, however, water monitoring data showed that 40 percent of America’s rivers, 46 percent of lakes, and more than half of the estuaries in the U.S. were too polluted for fishing or swimming. The number of impaired estuaries increased 37 percent since 1994, the report said, citing that estuaries are good indicators of broad water quality because they receive pollution from every stream and river in their watershed.

“Letting our kids splash in the creek, eating fish we caught on a camping trip, and drinking water from the tap without worry are things Americans should be able to take for granted,” Wodder said.


Groundwater Foundation Releases Source Water Guide

Still trying to educate your community about the importance of source water protection? The Groundwater Foundation’s (GF) Source Water Assessment and Protection Workshop Guide may be just what you need.

The guide provides local leaders and community members with the necessary tools to educate and motivate their communities to get involved with source water assessment and protection.

According to GF, the second edition of this guide has been reviewed, updated, and revised. The latest version includes an expanded collection of overheads, PowerPoint® slides, handouts, and activities intended to engage workshop audiences.

New additions to this year’s guide include:
- more detailed information about source water protection strategies;
- new insight into areas where the Safe Drinking Water Act and the Clean Water Act intersect; and
- a section of techniques to evaluate the workshop activities.

To download a free copy of the Source Water Assessment and Protection Workshop Guide (2nd Edition), visit the Groundwater Foundation’s Web site at www.groundwater.org/gi/swap/swap.html. Hard copies are available on the site for $49.95, by calling (402) 434-2740, or by writing to P.O. Box 22558, Lincoln, NE 68542-2558. A Microsoft PowerPoint® presentation of the guide’s overhead slides is available by request at no cost. Contact Rachel Herpel at rachel@groundwater.org.
Forests Help Source Water

A new report by the American Water Works Association (AWWA) highlights the importance of undeveloped land in source water protection.

“[For every 10 percent increase in forest cover in the source area (up to about 60 percent forest cover), treatment and chemical costs decreased approximately 20 percent],” says a review of the report in AWWA’s May 2004 Opflow newsletter.

The report notes that cities such as New York and Boston purchased land in their source areas in the 19th century and that they still enjoy clean water as a result of this. Technological improvements that allow most contaminants to be treated, however, have resulted in a movement away from this kind of protection.

“Treatment alone,” AWWA stresses, “although critical to preventing disease, should not be the sole protection of our drinking water.” Instead, they advocate for a “multiple-barrier approach” including high-quality source water, source water management and protection, appropriate treatment, distribution system management, and water quality monitoring.

The AWWA report Protecting the Source: Land Conservation and the Future of America’s Drinking Water and a companion handbook may be ordered online at www.awwa.org/bookstore. The price is $20. For more information, contact Caryn Ernst at (202) 543-7552 or e-mail her at Caryn.Ernest@tpl.org.

Fifty Years of Water Use

Despite a growing population, overall water use in the U.S. hasn’t changed much since the mid-1980s, finds a recent report from the U.S. Geological Survey (USGS). Released in April 2004, the Estimated Use of Water in the United States in 2000 provides a detailed look at water use trends over the past 50 years.

While the country’s population has grown by about 55 million people over the last 20 years, the report found that overall water use has declined from an estimated 440 billion gallons per day in 1980 to 408 billion gallons in 2000.

Since the 1960s, electrical generation and agricultural irrigation have been the biggest water users. The report showed a significant decline in the amount of withdrawals from these sources in the past 20 years. Estimated daily use for electrical generation declined from 210 billion gallons per day in 1980 to 195 billion gallons per day in 2000. In the same period, irrigation declined from 150 billion gallons per day to 137 billion gallons per day.

The most significant increase in usage shown in the report came from public water systems. The report noted that, with a population increase, as well as an increase in the number of people connected to public water systems, withdrawals from public water systems increased from 34 billion gallons in 1980 to 43 billion gallons in 2000.

This year, the USGS is celebrating 125 years of scientific service to America. To learn more about the USGS, visit their Web site at www.usgs.gov. A copy of the water use report is available at water.usgs.gov/pubs/circ2004/circ1268.

Additional information about water use may be found in Randolph E. Schmid’s article “Conservation Works: United States’ Water Use is Holding Steady” on the Environmental News Network Web site www.enn.com/news/2004-03-12/s_13974.asp.

Robots Monitor Drinking Water

Researchers at Syracuse University are implementing new technology that could have implications for source water protection and homeland security.

A network of underwater robots will collect samples and transmit water quality data via cellular phone signals to a computer at the university. The results will then be posted on a Web site (www.ourlake.org). This real-time solution eliminates collecting water samples in bottles and taking them to a lab for analysis. It also allows emergency responders to deal with incidents, such as spills and contamination, much more quickly.

The network will cover more than 25 miles of the Seneca River, as well as five connecting lakes that provide water for more than 500,000 people. The first robot was launched April 23, 2004, in Otisco Lake. Funded by the U.S. Environmental Protection Agency and New York state, the project is managed jointly by the Syracuse Center of Excellence and the Upstate Freshwater Institute.

In the future, project researchers envision water quality sensors to aid in homeland security. “These tools will help us to protect our water supplies from both unintentional and intentional contamination events,” says Charles Driscoll, principal investigator and professor of environmental systems engineering at Syracuse.

First developed in Minnesota in the 1990s, the New York robot network project will be fully operational by summer 2005. Similar underwater monitoring programs are under way in Washington, Minnesota, Nevada, and North Carolina.
Water Improvement Funds Announced

U.S. Department of Agriculture (USDA) Secretary Ann M. Veneman announced $221.5 million for rural water and wastewater loans and grants at an Earth Day (April 22, 2004) press conference. The investment—$109 million in loans and $112 million in grants—will benefit 122,500 homes and businesses in 44 states.

"These funds are helping ensure a healthy and clean environment for future generations of rural Americans," Veneman said. "These funds will enable rural communities to build and improve rural water and sewage systems that will provide cleaner water, recreation, and wildlife resources."

Manchester, Kentucky, is one community that received USDA Rural Development funds. Half the residents there rely on wells for their water. But the county health department determined that most of these wells showed significant quantities of pollution. The well water was so dirty, in fact, that it turned clothes orange, and some people made weekly treks to fill empty plastic jugs with spring water.

A combination of a $1.2 million loan and a $680,000 grant will help the local water district extend approximately 147 miles of waterlines to serve 811 new customers. A 100,000-gallon storage tank will supply additional capacity and a booster pump station will insure adequate pressure.

Since 2000, USDA Rural Development has funded water and wastewater improvements totaling $4.9 billion for 2.7 million rural residents in more than 3,600 communities.

To learn more about USDA water and wastewater loans and grants, visit their Web site at www.usda.gov/rus or contact your state Rural Development office. For the phone number of your state office, contact the National Environmental Services Center at (800) 624-8301 or (304) 293-4191. The list is also available on the RUS Web site at www.usda.gov/rus/water/states/usamap.htm.

Infrastructure Needs Are Immense

Federal investments, along with increased water rates, are needed to meet between $250 and $300 billion in drinking water infrastructure needs over the next three decades, said Howard Neukrug, chairman of the American Water Works Association’s (AWWA) Water Utility Council in testimony before a U.S. House of Representatives subcommittee.

"AWWA remains committed to the principle of full cost recovery through rates," Neukrug said at the April 28, 2004, meeting of the Water Resources and Environment Subcommittee. "However, AWWA does believe that due to concurrent needs for investment in water and wastewater infrastructure, security projects, replacement of treatment plants, new drinking water standards, and demographic changes, many utilities will be very hard pressed to meet their capital needs without some form of federal assistance."

AWWA’s estimate echoes previously published estimates by the U.S. Environmental Protection Agency (EPA) and the American Society of Civil Engineers (ASCE). In the 2002 report Clean Water and Drinking Water Infrastructure Gap Analysis, EPA estimates the total drinking water infrastructure needs at $265 billion over 20 years.

The ASCE puts the water infrastructure funding gap at $534 billion over the same time period, saying that the EPA estimate doesn’t adequately address population growth and new construction. The ASCE has called for the federal government to establish a trust fund to aid water and wastewater infrastructure replacement.

To read Neukrug’s complete testimony, visit AWWA’s Web site at www.awwa.org/Advocacy/govtaff/legislat/leg_test.cfm.

The Clean Water and Drinking Water Infrastructure Gap Analysis may be downloaded from EPA’s Web site at www.epa.gov/safewater/gapreport.pdf.

To learn more about ASCE’s trust fund proposal, go to www.asce.org/pressroom/news/display_press.cfm?uid=1182.
Utility Leasing Means Big Bucks

A February 2004 report released by the General Accounting Office (GAO) indicates that tax strategies have contributed to an increasing trend in the number of big businesses that pay little or nothing in taxes each year. And thanks to loopholes in the federal tax code that allow these practices to take place, the burden has shifted heavily onto individual taxpayers.

In one popular strategy known as SILO [sale-in, lease-out], companies purchase public assets, such as water and sewer systems, and then lease them back to the municipality they were purchased from in order to reap the tax benefits. As the owners of public assets, companies are then allowed to claim depreciation and interest deductions. Critics of SILO agreements have projected these deals will cost the U.S. Treasury an estimated $33 billion over the next 10 years.

SILO agreements have come under fire by Congress and the White House. Since November, the Treasury has put SILO deals on hold until the Internal Revenue Service (IRS) can conduct an investigation. In 1998, the IRS banned a similar strategy known as LILO (lease-in, lease-out) agreements based on the grounds that they had no economic substance and were improper tax shelters.

For a copy of the GAO report

To learn more about Sale-In, Lease-Out arrangements, read the following articles online “Free Riders,” by Lee Drutman, online at www.TomPaine.com/feature2.cfm/ID/10220 and “Will SILOs Collapse” by Ashlea Ebeling, online at www.forbes.com/2004/03/03/cz_ae_0303beltway_print.html.

EPA Announces DWSRF Allotments

On April 16, 2004, the U.S. Environmental Protection Agency (EPA) announced appropriations for the drinking water state revolving fund (DWSRF).

For fiscal year 2004, the DWSRF appropriation is $845 million, about the same as the previous year and down slightly from FY 2002’s $850 million level. The FY 2004 amount includes national set-asides totaling more than $14 million: $12.7 for American Indian and Alaska Native Villages and $2 million to monitor unregulated contaminants. Both of these set-asides are comparable to previous years. Funding for operator certification, however, has been slashed from $30 million to zero.

The allotment of DWSRF state grants is derived from state drinking water needs identified in the most recent Drinking Water Needs Survey (published in February 2001). Each state must receive a minimum of one percent of the national appropriation. As mandated in the Safe Drinking Water Act Amendments of 1996, American Indian and Alaska Native Village water systems are funded at 1.5 percent of the total appropriation.

EPA also announced funds for the Public Water System Supervision (PWSS) Grant Program. Funded by Congress each year, state drinking water programs use these grants to monitor drinking water quality, conduct sanitary surveys, enforce drinking water standards, and provide technical assistance to local communities. The FY 2004 funds total $102 million.

PWSS funding levels are determined on the basis of state population, state land area, the number of community and non-transient water systems, and the number of transient non-community water systems. As with DWSRF allotments, no state receives less than one percent of the total appropriation.

For more information about the DWSRF or PWSS, visit EPA’s Office of Ground Water and Drinking Water Web site at www.epa.gov/OGWDW or call (800) 426-4791.
Behind Closed Doors at the EU

Leaked documents and a string of e-mails have put into question the motives behind a European Union request for 72 countries to open up their water markets to foreign investors.

The documents, supplied to the Polaris Institute, revealed discussions leading up to the 2000 World Trade Organization (WTO) trade negotiations. The European Commission (EC), the negotiating board of the European Union, communicated regularly with representatives from large European water companies to discuss obstacles they faced when seeking market access for their services in other countries.

RUS Loans: Poverty Rate Unchanged; Others Up

Interest rates for Rural Utilities Service (RUS) water and wastewater loans have been announced. Market and intermediate rates are up, while the poverty rate is unchanged.

RUS interest rates are issued quarterly at three different levels: the poverty line rate, the intermediate rate, and the market rate. The rate applied to a particular project depends on community income and the type of project being funded.

To qualify for the poverty line rate, two criteria must be met. First, the loan must primarily be used for facilities required to meet health and sanitary standards. Second, the median household income of the area being served must be below 80 percent of the state’s non-metropolitan median income or fall below the federal poverty level. As of April 1, 2004, the federal poverty level was $18,850 for a family of four.

To qualify for the intermediate rate, the service area’s median household income cannot exceed 100 percent of the state’s non-metropolitan median income.

The market rate is applied to projects that don’t qualify for either the poverty or intermediate rates. The market rate is based on the average of the Bond Buyer index.

The rates, which apply to all loans issued from July 1 through September 30, 2004, are:

- poverty line: 4.5 percent (unchanged from the previous quarter);
- intermediate: 4.75 percent (up 0.375 percent from the previous quarter); and
- market: 5.0 percent (up 0.625 percent from the previous quarter).

RUS loans are administered through state Rural Development offices, which can provide specific information concerning RUS loan requirements and applications procedures.

For the phone number of your state Rural Development office, contact the National Environmental Services Center at (800) 624-8301 or (304) 293-4191. The list is also available on the RUS Web site at www.usda.gov/rus/water/states/usamap.htm.
Worldwatch Institute Releases Report
www.worldwatch.org

Paper or plastic bags? Bottled or tap water? Making environmentally responsible purchases can be a daunting task. Fortunately, concerned consumers can now find answers to many of their questions in Good Stuff? A Behind-the-Scenes Guide to the Things We Buy, a free online publication by the Worldwatch Institute.

Produced in partnership with nine organizations as a hands-on companion to Worldwatch’s annual State of the World report, Good Stuff traces what goes into the production, use, and disposal of 25 common consumer items. In addition to educating buyers about the environmental and social impacts of their purchases, the guide includes practical suggestions for living a greener, healthier life; an “eco-IQ” quiz; and a challenge page where readers agree to take three actions for a better environment.

Worldwatch’s annual State of the World report focuses on consumption too. The report finds that the world is “consuming goods and services at an unsustainable pace, with serious consequences for the well-being of people and the planet.”

“Rising consumption has helped meet basic needs and create jobs,” says Christopher Flavin, Worldwatch Institute president. “But as we enter a new century, this unprecedented consumer appetite is undermining the natural systems we all depend on and making it even harder for the world’s poor to meet their basic needs.”

Worldwatch encourages a combination of tax reforms, new laws, better use of raw materials, and personal responsibility to combat excessive consumption.

On the Web

USDA State Fact Sheets
www.ers.usda.gov/statefacts/

The U.S. Department of Agriculture’s Economic Research Service (ERS) publishes fact sheets for each state and the U.S. as a whole. Information in the fact sheets includes: per capita income, poverty rate, unemployment rate, percent employment change, and top agricultural commodities.

Although the fact sheets primarily focus on agricultural issues, they could be useful for planners and in completing loan applications for system upgrades. “The tables provide a useful compilation of key demographic and agricultural information for rural areas,” says Eileen Stommes, ERS deputy administrator. “Each table contains a link to the original source table so that you can explore the subject in greater detail.”

Fact sheet data may be downloaded into MS Access for further analysis and to create charts and graphs. Additional topic areas, such as water quality, are provided and contacts for ERS staff who can provide more detailed information.

Pollution in Your Community
www.scorecard.org

Ever wonder how much pollution is in your community? At Environmental Defense’s Web site www.scorecard.org you can find out which pollutants are impacting your community and who is responsible for them.

The site allows you to find your community based on your Zip code and presents information in four categories: air, waste, land, and water. Included are lists of Superfund sites and water quality problems. You’ll also find an environmental justice report for your community, maps, ways to compare your community to others, and methods for taking action to rectify pollution problems.

Probably best known for their work in banning the pesticide DDT, Environmental Defense, according to their Web site (www.environmentaldefense.org), links “science, economics, and law to create innovative, equitable, and cost-effective solutions to society’s most urgent environmental problems.”

Worldwatch Institute Releases Report
www.worldwatch.org

Looking for the old National Drinking Water Clearinghouse (NDWC) Web site?

As part of a reorganization effort, NDWC services are now part of the National Environmental Services Center (see the director’s perspective at the beginning of this issue for more about the reorganization). In some ways this is a big change, in others it isn’t. The NDWC has, for many years, been part of NESC, along with programs devoted to wastewater, environmental training, alternative technologies, and community demonstrations. Along with the reorganization, information on the previous NDWC site is now included under the NESC Web site.

You’ll still get everything you’ve come to expect from us: technical assistance, Web site, free and low-cost products, and On Tap magazine. Plus, you’ll get more, because you’ll have easy access to an even wider variety of information and services important to managing water and wastewater services.
Management Help Available
www.mapfornonprofits.org

Running a nonprofit organization like a business is easier said than done. The Management Assistance Program for Non-profits (MAP) provides management and board development services for nonprofit organizations and governmental agencies, such as water utilities.

From financial management and accounting to strategic planning, MAP will conduct an assessment of your needs at no charge and with no obligation. They will then give you a cost estimate for services. Call MAP at (651) 647-1216 or visit their Web site for more information.

Located in St. Paul, MAP provides services in Minnesota. Their Web site provides links to similar training in other areas, although not all states are represented.

The MAP Web site also provides a link to the Free Management Library (www.managementhelp.org). With more than 675 topics arranged in 75 categories, this site provides comprehensive coverage of management issues. Whether it’s problem solving or public relations, customer service or computers, risk management or research methods, you’ll find the information you need for your system presented in an easy-to-comprehend style.

Water on Public Television

P.O.V. Borders, the PBS award-winning documentary series, begins its second year of Web-only programs by focusing on the environment. Water figures prominently in the new season, with Webcasts devoted to polluted waterways, bottled water, and the invisibility of water.

“We launched P.O.V. Borders in October 2002 to explore the potential of interactive, online narrative,” says Cara Mertes, P.O.V. executive director and producer. “We see the series as an ongoing showcase for engaging point-of-view storytelling experiences conceived especially for the Internet. Each episode will ask visitors to consider an aspect of their everyday lives in ways that challenge their preconceptions and expand our own borders of understanding.”

To view P.O.V. Webcasts, you’ll need a media player (RealPlayer, QuickTime, or Windows Media Player) and a modem capable of 56k (cable or DSL is better).

P.O.V. also produces television shows, including a new documentary about privatizing water. Looking at tensions in Bolivia, India, and Stockton, California, “Thirst” reveals how water is becoming the catalyst for community resistance to globalization. Focusing on one of the 21st century’s greatest issues, this film by Alan Snitow and Deborah Kaufman examines the conflict between public stewardship and private profit, where activists claim that water is a human right and corporations declare it a commodity.

“Thirst” is scheduled for a July release. Check local listings for showtimes in your area.

Source Water Protection Materials
www.epa.gov/OGWDW/protect/sources.html

Protecting source water—untreated water from streams, rivers, lakes, or underground aquifers used to supply private wells and public drinking water—is one of the most important tasks a community can undertake. But, the sheer scope of such a project can be overwhelming.

The U.S. Environmental Protection Agency has compiled an extensive bibliography of materials on source water protection that would be useful in planning, executing, and educating the public about source water protection. Included are technical materials, outreach materials, fact sheets, case studies, brochures and links to other Web sites.

Public Works Online
www.pwmag.com

The monthly Public Works Magazine has a companion edition on the Web site www.pwmag.com. Covering engineering, construction, and maintenance of public works infrastructure, the online version enhances the magazine’s offerings with daily news about the industry and different searchable indexes.

Indexes on the site include a buyer’s guide with thousands of products, a list of consulting engineers and their contact information, and a list of various manufacturers in a searchable format.

Public Works Magazine and the online edition are published by Hanley Wood, LLC.
For several years, we’ve heard different organizations encourage utilities to run their operations “like a business.” In your experience, what is the most important business practice small systems could adopt that they aren’t currently doing? Why is that particular business practice so important?

Business Awareness

Everyone has to view the water utility program as a business: Not only the utility employees themselves (management as well as operations) and the governmental levels above the utility program (mayor and city council, board of directors), but also the consumer. Think of it as the three sides of a triangle.

Management

Customer

Utility Staff

Each side must realize that the utility program is a business. If one side is weak, the strength of the triangle is weakened (i.e., the business is weakened).

It is probably easiest for the utility staff to run the utility program as a business. After all, they are involved in the day-to-day operations and can see the benefits of a business-oriented operation. But it is equally important for management to view the utility program as a business. They influence long-term direction and the need for capital expenditures. Having management view these issues from a business perspective provides the direction and focus under which everyone can operate effectively.

The customer will almost always view your utility program as a business. They ask, “How much value do I get for the monthly water bill I have to pay?” Obviously the customer will want the most value for the least expense. Realizing this provides the utility staff with another incentive for providing the best product possible. Typically the utility staff will strive to provide the quantity to meet demands and the quality to meet the regulations.

If you are operating as a business, your product now must be appealing to the customer (e.g., taste and odor issues). You must insure that it is the best product possible by maximizing public health protection. You must get away from the “we are the only water system available” mentality. Management and utility staff should develop an attitude of “I have to earn their business.” This attitude brings an entirely different perspective into the utility program. Now we go from just meeting the regulations to maximizing the quality of the product. And we have to address the perceived monetary value of this product. This means that our public relations program must be top-notch in order to promote the value of the product.

What, then, is the most important business practice that a small utility could adopt? It would be to make sure that everyone—and I mean everyone—views the utility as a business.

Customer Service Is Key

Every manager’s goal should be to run a utility like a real business. In my experience, the most important business skill for systems is good customer service. The idea is to stop customer complaints before they start, although this is not always possible.

When someone has a question about the service or a bill, this person generally has a strong interest in resolving the issue. Being in the water business, you are often the only game in town, and it is not usually possible for them to take their business elsewhere. Therefore, their issue needs to be resolved to a degree of satisfaction acceptable to the customer.
It is important for utilities to stick to established policies when dealing with customers, and it helps to have these policies available for your customers. Annual mailings and Web sites go a long way in providing customers with information and can often prevent many problems.

Never promise something you cannot deliver, and never promise a deadline that you cannot possibly meet. Always follow up on all customer complaints to see if their needs have been met to their satisfaction. This might be a quick e-mail or a simple note or even a courteous phone call.

Those who handle customer calls should answer all questions accurately, thoroughly, and enthusiastically. When customers are greeted with a friendly voice they get a real feeling that the person representing the utility has an interest in helping them. Treat everyone as your most highly valued customer and customer satisfaction should be no problem.

Start a Replacement Fund

One of the biggest problems I have seen with small systems concerns replacing infrastructure. Pipes and treatment facilities, like anything else, wear out over time. Almost no one is building a fund to do replacement of distribution systems or treatment plants when it becomes necessary. Nationally, the drinking water infrastructure needs for replacement of aged and failing system components is in the billions of dollars.

At one time, the residents of small towns realized the need for a water system and got together the funds to build one. Since then, everyone has taken for granted that the water system is there, without thinking about what will happen when it finally dies. This issue should be a major concern of managers, owners, and boards.

Without an infrastructure replacement fund, how can broken pipes be quickly replaced or failed treatment and pumps gotten back on line? Drinking water is necessary for the continued protection of public health, both now and in the future. Unless we set rates that allow for an accumulation of funds for replacing the water system, we are setting ourselves up for a crisis of major proportions when water systems start failing and our customers ask why there is no longer safe water at every tap.

Don’t Forget Public Service Mission

For too many years, there’s been an ill-advised push for water utilities to model their operating practices after the private sector and, in some cases, turn them over to private management companies. Applying a strictly business model to the operation of public drinking water systems is fraught with contradictions and potential long-term problems. The mission of businesses is to generate profits; the mission of water suppliers is to serve the public through the preservation and maintenance of healthy and safe drinking water systems. The recent and dismal experience of Atlanta—a city that turned its water system operations over to a for-profit business and then faced unacceptable reductions in customer service and system maintenance—is just one example of how a business-only mindset can drive a water system into the ground. Atlanta subsequently reclaimed operation of their water utility and, even though many improvements are needed, their future is now looking better than the past.

The good news is that there are many water managers who run their small and municipal water systems well and in the black by following common sense management skills in their role as custodians of the public trust. These smart water managers have many virtues, but if I had to boil them down to one that is particularly important, it would be a commitment to system maintenance and preservation. Aggressive leak detection and repair, good metering, and an active and practical dedication to stewardship so that surface and ground water sources are optimally protected are some of their chief concerns and accomplishments.

Jerry Biberstine
Senior Environmental Engineer
National Rural Water Association

Frank DeOrio
Director of Municipal Utilities
Auburn, New York

Amy Vickers
Engineer and Water Conservation Specialist
Amy Vickers and Associates

The Drop Box

Do you have a suggestion for improving this magazine or an idea for an article we should explore?

Do you have a question for our “Ask the Experts” column or a Web site that you find particular helpful?

On Tap editors are always eager to learn from you. Here’s how to contact us:

Mark Kemp-Rye
e-mail: mkemp@wvu.edu
phone: (800) 624-8301
ext. 5523

Kathy Jesperson
e-mail: kjespers@wvu.edu
phone: (800) 624-8301
ext. 5533

Or write to us at:
National Environmental Services Center
West Virginia University
P.O. Box 6064
Morgantown WV 26506-6064

www.nesc.wvu.edu

OPINION
Remembering Larry Rader, from Ethiopia

In June 2002, I met Larry Rader while he was in Addis Ababa at the World Bank’s International Conference on Water Supply and Sanitation for Small Towns and Multi-Village Schemes.

After the conference, I got a chance to travel through Ethiopia with him to see some water supply systems. These travels created an opportunity to know him more and to be his friend. Later I learned that he was in Ethiopia to share his experience about independent circuit rider service providers. [Rader worked as a circuit rider in the U.S.]

We appreciated his capacity to quickly adapt to the rural Ethiopian situation, which he politely attributed to his Appalachian background.

We have benefited from his visit in at least two ways. First is through the idea of the circuit rider. Ethiopia is a fairly large country with 85 percent of the 70 million population living in rural areas. For all involved in the provision of water to this large segment of the population, system operation and maintenance is a critical issue. Some studies suggest that 30 to 40 percent of the rural water supplies are not functional at any time. The communities expect this service from the government. As the country is in a state of deep decentralization and devolving much of government activities to the private sector, the idea of the circuit rider service provider for preventive and optimum maintenance to these widely scattered rural water supply schemes was a kind of magic bullet.

Second, we are benefiting a great deal by reading your quarterly magazine On Tap, which Larry kindly made possible by adding our names to your mailing list. Besides exposing us to wider experiences in the U.S., the magazine helped us to update our knowledge in the sector. Larry’s articles, which are very relevant to almost all our urban water supply systems, are used as a reference. Indeed we are happy today to see the number of On Tap readers expanding here in Ethiopia.

It is with great shock that we learned of Larry’s death. In Africa there is a saying, “The passing away of an elderly man is equivalent to the burning down of a library.” For us his departure is like this. We have lost an experienced practitioner and a knowledge bank just as we started to milk it. Despite this, we will continue to develop and benefit from the idea of the circuit rider and will continue reading your magazine and will strengthen our relationship with you.

Tsefaye Bekalu
Consultant
Water and Sanitation Program, Africa
World Bank

Editor’s Note: Larry’s death was a great shock, and we too have the sense of the “burning down of a library.” Larry’s legacy is his writing and music. Even though he is physically gone, he lives on in his articles, stories, and songs. And, in these, we have at least some of his knowledge.

Larry’s trip to Africa had a profound effect on him. One of his final wishes was to have his ashes spread at the headwaters of the Blue Nile in Ethiopia. So we hope that with Larry’s final adventure, his presence will be forever felt in the country he grew to love.
All you have to do is ask.

The National Environmental Services Center (NESC) exists to assist small and rural communities with their drinking water, wastewater, environmental training, solid waste, infrastructure security, and utility management needs and to help them find solutions to problems they face.

Our staff of environmental specialists, engineers, certified operators, technical writers, editors, and trainers understand the latest technologies, regulations, and industry developments. Over the last 25 years, we’ve helped thousands of communities find solutions to their environmental problems. We’ve also helped thousands of individuals learn more about environmental issues.

At NESC, we believe that you can’t do the job correctly without the right tools and that knowledge is the most important tool of all.

We’re waiting to put NESC’s assistance, solutions, and knowledge to work for you.
“Planning: that is what small towns across the country do not do. They tend to live almost day-by-day and pray nothing bad happens to jeopardize their infrastructure or services they provide to their communities,” says David Kindelspire, an environmental specialist with the Missouri Department of Natural Resources, in a Winter 2004 On Tap article.

Proper planning—coupled with its inseparable twin, budgeting—is, most experts maintain, the best habit a community can undertake to insure future success. In fact, they say, working without a plan is like heading out on a cross-country road trip without a map. “If you don’t know where you’re going, any road will take you there,” says Jim Seroka, director of Auburn University’s Center for Government Services and a trainer for the Alabama Rural Water Association.

If planning and budget preparation are so important, why don’t more systems do them? Both Kindelspire and Seroka cite a number of reasons, including: lack of time, lack of training, a misplaced sense of preserving flexibility, and not wanting to uncover serious problems.

“I’m not faulting the local leaders for this failure to plan,” Kindelspire adds. “Small communities just can’t afford to buy the expertise needed to initiate an effective planning process. However, this skill can be easily learned with the help of almost all state and federal technical assistance agencies.
“That's why, speaking as one agency assistance provider, it is vital to spread the planning word as widely as we can, and help steer these communities on the road to success though planning,” he says. “In the long run, in almost every case, a well-executed and thought-out plan will ultimately lead to community successes and quality of life improvements for its citizens.”

Analyse Today, Prepare for Tomorrow

When a community undertakes a first plan, the terminology can be overwhelming. Typically, planning comes in three varieties: short-term (to address needs in the near future or for specific problems), long-term (two to five years), and strategic (five years and up). Planning is dynamic, though, and even long-term and strategic plans are revised on a regular (usually annual) basis. Capital planning refers to specific projects such as a line extension or treatment plant upgrade. (See sidebar at right for more about capital planning.) This article examines strategic planning and how it works with a system's annual budget.

According to Seroka, strategic planning will provide numerous benefits to the community. A good plan will:

• clarify future directions,
• establish priorities,
• develop effective strategies,
• consider the consequences of decisions,
• deal with changing circumstances,
• improve internal management,
• build internal teamwork and expertise,
• build external partnerships,
• strengthen customer relationships, and
• improve decision making processes, leading to better public policy choices.

Regardless of your plan's timeline or what you call it, four questions are common to all planning endeavors:

1. Where are we now?
2. Where do we want to be?
3. How do we get there?
4. How will we measure our progress?

To answer these questions, the strategic plan should determine customer needs, create programs to fill those needs, determine what the needs will cost, and figure out a way to pay for the plans. Other questions to address may include: What are the current and future needs of the system? What parts of the system will need to be repaired or replaced in the next several years? Will we be adding customers? Do we have qualified personnel to operate the system now and down the road?

Take a Good, Hard Look

“A successful manager has to always be aware of changes taking place in the environment in which the business operates and be prepared to make necessary changes,” says Carryn Lee, financial analyst with the Kentucky Rural Water Association, in a Fall 2003 WaterProof article. “Owners, managers, and customers of utilities may be required to make substantial investments in the foreseeable future and should seek to assure themselves that the plan for operating the utility is the best that it can be.”

A common technique for understanding various changing conditions is known as a SWOT [Strengths, Weaknesses, Opportunities, Threats] Analysis. For most purposes, a review of internal conditions (good and bad) and what's going on externally will be sufficient.

System strengths could include things like good relationships with customers, trained operators who will likely remain in the community, solid finances, and

Capital Planning

According to Mike Hattery of Cornell University’s Local Government Program, a capital plan is “a multi-year financial plan that:

• lists and describes capital projects a local government plans to undertake (e.g., line extension or plant upgrade);
• indicates how projects will be funded; and
• projects the effects of the plan on key financial variables, such as the real property tax rate.

Assessing the effects of a group of capital projects on the general financial picture is sometimes referred to as fiscal capacity analysis,” Hattery notes. “The length of the capital plan period is a local decision, but five or six years are often recommended.”

An article titled “How to Develop a Multi-Year Capital Plan” has more information about capital planning and is available on the National Environmental Services Center Web site at www.nesc.wvu.edu.
up-to-date infrastructure, including the treatment plant and distribution network. Conversely, if there’s a lot of turnover with employees or money troubles or aging facilities, these weaknesses must be listed.

External conditions—be they threats or opportunities—must also be discussed. These issues include whether or not your area is growing or losing population, if new regulations are in the offing, if private companies are buying systems in the area, and if there are any larger plans for consolidating or regionalizing systems. Of course no one can see into the future, but a SWOT analysis will be invaluable when typical problems arise.

Once these internal and external conditions have been examined, planners will be able to formulate good answers to the four central questions cited above.

**Where are we now?**

The SWOT analysis, if done honestly, provides an accurate picture of the way things are right now. To supplement this analysis, it’s also useful to collect data about current customers, current water consumption patterns, and current system capacity.

**Where do we want to be?**

What will the system be like in five, 10, 20 years? When will we need to make major upgrades or replacements? Will we add new customers? These questions allow you to state, in concrete terms, where your system will be by the end of the plan’s timeline. Many systems find it useful to craft a mission statement and a vision statement to capture who they are, what they do, and what they seek to achieve.

**How do we get there?**

To achieve the goals you’ve set, describe how to make them happen. Each goal should have a specific plan of attack and the list should be prioritized. Document who will be responsible for leading each project, when it will be done, and how much it will cost. Take advantage of strengths and opportunities, minimize weaknesses and threats to the system. Remember to be realistic. Setting too many goals often means that none are done very well.

**How will we measure our progress?**

It’s easy to say “we will add new customers” but hard to quantify and, therefore, hard to document progress. A better method is to say, “we’ll add 50 new customers in each of the next five years.” Decide what the milestones are for the various goals and set stages for achieving them. Goals should be measurable, and progress (or lack thereof) should be reported to the board and other stakeholders on a regular basis.

After the first strategic plan is in place and stakeholders agree that it provides a good roadmap to the future, it’s time to match funding to goals. This is where plans and budgets are married.

---

**Ten Ways to Save Money**

When expenses are outpacing revenue, it’s easy to say “we’ll just raise rates.” There are other ways to make ends meet, and your customers will appreciate it if you can balance the books without increasing their bill.

1. Collect overdue accounts—Collection and shutoff policies must be enforced or you’re losing money.
2. Reduce system leaks—Water loss should be no more than 15 percent of the treated water you produce.
3. Make sure meters are working—Meters are to a water system what fare counters are to cab drivers. If they aren’t working, people are riding for free.
4. Update fees, deposits, charges—Check these items. Some may date back many years and be ready for a more realistic update.
5. Get bills out on time—Everyone who uses water should get a bill on a regular basis.
6. Find thieves—Water theft is a serious issue in some communities.
7. Buy in bulk—Purchasing supplies, such as chlorine, are usually cheaper in mass quantities. Consider working with neighboring systems to buy supplies and share equipment.
8. Add new customers—It may be cost effective to add nearby homes and businesses not currently in the distribution network.
9. Invest money—Find a bank that offers interest on your bank account. Put reserves in CDs or money market accounts.
10. Run the pumps at night—In some places, the electric utility offers significantly lower rates during off-peak hours.

---

**The Annual Expense Budget**

The word “budget” comes from the French bougette, meaning “little bag.” This term was adopted by the British when the chancellor of the exchequer presented his annual report to Parliament. The chancellor was said to open his ‘budget’ or bag containing financial documents. Today, the “bag” notion is, obviously, more figurative than literal. Nevertheless, the basic concepts of an allotment of funds, keeping track of the money, and planning for the future is still relevant.

“Incorporating long-term planning into the annual budget is the first component of effective budgeting,” says Stacy Anderson, manager with the accounting firm Virchow Krause and Company. “The budget is the primary tool local governments use to make decisions about service priorities and fiscal policies. The quality of the decisions for allocating scarce resources depends on the quality of the process employed. By adopting best practices in budgeting, an organization can improve decision making and operations while enhancing public accountability.”
According to the manual *Managing a Small Drinking Water System* developed by training specialists at the National Environmental Services Center (NESC), the annual expense budget is “a major tool for tracking all necessary and authorized expenditures. By having a budget, you can: help reduce unnecessary costs, determine if actual costs are being incurred as projected, control spending, ensure accountability, and improve the ability to anticipate costs.”

Most expense budgets have five items:
1. operating expenses
2. emergency operating reserves
3. debt service payments
4. debt service reserves
5. reserves for asset replacement

The Community Resource Group/Southern Rural Community Assistance Program (RCAP), in their *Small System Guide to Financial Management*, encourages systems to check the budget to see that it includes expenses for utility bills, chemicals, insurance premiums, debt, emergencies, and repairs or replacements. Before beginning a new budget, have the previous year’s budget on hand. It’s also a good idea to have several years’ worth of budgets for reference and to calculate averages.

**Operating Expenses**

Review the previous year or two’s expenses. Then, list the various activities the water system performs and estimate whether these activities will cost more in the year ahead or less. Here are some questions:

- Will you do more or less sampling?
- Will your operators require training or upgraded certification?
- Will you need different supplies?
- Will customers increase or decrease?
- Will a drought add expenses?
- Will office costs, including postage, increase?
- Will the system need significant repairs?
- Will the current inventory be sufficient?

The answers to these questions will help you craft an accurate estimate for the new budget. (The sidebar on page 22 provides a simple ratio that shows if operating expenses are sufficient.)

**Emergency Operating Reserves**

At a minimum, you should reserve 10 percent of the operating budget for emergencies. However, if your system is an old one or if you have extenuating circumstances, such as drought, you will probably need to increase this amount. Additionally, if you’ve been averaging, say, 15 percent for emergencies over the last several years, budget for at least 15 percent.

**Debt Service**

The budget must reflect how much you owe and what the payments on this debt are. Remember to include both principle and interest payments in the budget, and don't forget any new loans you'll incur during the budget period.

**Debt Service Reserves**

Most, if not all, loans or bonds require you to maintain a certain level of reserve. Review all loan agreements and bond covenants to see what your requirements are. (The sidebar on page 22 provides a ratio that helps determine if debt service reserves are sufficient.) By paying loans on time and maintaining adequate reserves, you ensure that your system remains eligible for these funds in the future.

**Asset Replacement**

If you will need to replace significant portions of your system, you must budget for it. According to NESC’s *Managing a Small Drinking Water System*, “the amount of the reserve could be based on a portion of the replacement cost of the system or on the cost of the most expensive scenario of a system breakdown.”

Running a water system involves many different tasks. From office management to water treatment, there are probably dozens of different activities. To keep track of expenses across these various functions, CRG suggests the following budget categories:

- annual debt service;
- purchased water;
- salaries and other personnel costs;
- office supplies and expenses;
- utility costs;
- operating supplies (including tools, parts, chemicals);
- repairs (can also include separate expenses for contractors);
- transportation;
- equipment (including leases);
- insurance;
Use Simple Ratios to Assess Financial Health

The U.S. Environmental Protection Agency (EPA) has come up with two simple ratios that a water system can use to determine its financial health: an operating ratio (OR) and a debt service coverage ratio (DSCR). Both are easily constructed using readily available data.

**Operating Ratio Measures Overall Health**

A water system can have the cleanest, safest drinking water around, but if it isn’t covering its expenses, it can’t keep it up forever. The OR shows whether or not a system has enough revenues to cover its expenses. An operating ratio of 1.2 or greater indicates that a system is in good financial health. A ratio of less than 1.0 means that expenses are more than revenues.

Operating Ratio (OR)

\[
\text{OR} = \frac{\text{TOR}}{\text{O&M}}
\]

- **TOR** = Total Operating Revenues
- **O&M** = Operating and Maintenance Expenses (excluding depreciation, interest, or other department expenses)

**Debt Service Coverage Ratio Measures Ability to Pay**

As with the operating ratio, a system must have adequate revenue to cover its debt service. The DSCR measures a system’s ability to cover its debt, over and above its operating expenses. A debt service ratio of 1.5 or greater is considered very good; a ratio of between 1.0 and 1.5 is considered acceptable; and a ratio of less than 1.0 means that there is inadequate revenue to cover the system’s debt service.

Debt Service Coverage Ratio (DSCR)

\[
\text{DSCR} = \frac{\text{AGR} - \text{O&M}}{\text{OAP & IC}}
\]

- **AGR** = Annual Gross Revenues
- **O&M** = Operating and Maintenance Expenses
- **AP & IC** = Annual Principal and Interest Charges

Why are these two ratios significant?

According to EPA’s *National Characteristics of Drinking Water Systems Serving Populations Under 10,000*, as the size of a drinking water system increases, these ratios improve. Conversely, small systems are most often the ones in financial peril. For example, 61 percent of systems serving fewer than 101 customers and 43 percent of systems serving between 101 and 500 customers have an operating ratio of less than one.

The same study found that the “vast majority of small systems have no debt. Of those systems serving fewer than 100 people that do have debt, however, most have debt service ratios below one.” Achieving financial health is an important component of the 1996 Safe Drinking Water Act (SDWA) amendments and of particular concern for those responsible for small systems.

Experts point out that these ratios do not represent a complete financial assessment. Rather, they should be viewed as a general way for a small system to judge whether or not they are on the right track. “Achieving the public health protection objectives of the SDWA requires systems with strong technical, financial, and managerial capacity,” says Peter Shanaghan, former small systems coordinator for EPA. “Financial ratios are an exceptionally important indicator of a system’s financial capacity.”

- building expenses (including mortgage or rent);
- professional expenses (accounting, auditing, legal, engineering);
- postage;
- telephone (and Internet access, if you have it);
- licenses, professional dues, subscriptions, etc.;
- training and out-of-town travel; and
- taxes.

Who should be involved in creating a system budget? The governing board or water system owners are ultimately responsible for the budget and are, therefore, instrumental for its planning and implementation. System managers will, of course, need to be involved in this process. Don’t forget that other employees, particularly operators and office staff, will have valuable insights on how to budget more effectively.

The Revenue Budget

After completing the annual expense budget—all the money you’ll be spending for the year—it’s time to construct the revenue budget—or, all the money you’ll bring in over the coming year. In an ideal world, the revenue budget will be equal to (or exceed) the annual budget right off the bat. In reality, revenue usually falls somewhat short of expenses, forcing the tough decision of whether to increase revenues (most often through a rate hike) or decrease expenses or both.
CRG’s *Small System Guide to Financial Management* identifies two types of income common to most systems. Operating revenue is money coming from water sales, connection fees, forfeited meter deposits, late payments, penalties, and reconnection fees. Non-operating revenue is income from interest on checking and reserve accounts and meter deposits. “We recommend you ignore non-operating revenues and only count on operating revenues to cover the expense of operating your system next year,” the guide notes.

When estimating revenue for the coming year, determine if you’ll be losing or gaining customers, how much rates will go up, and the amount of unpaid bills owed you. Except for debt service requirements, budget items have varying degrees of flexibility. As you evaluate revenue and expenses, you’ll be able to make adjustments.

Some items, such as office rental, are less controllable. Other expenses may be reduced. (The sidebar on page 20 provides ten ways to cut costs.) The process of planning the expense budget, estimating revenues, and setting rates is interactive. More often than not, systems will come to the realization that they must raise rates.

**Ongoing Evaluation**

Once the expense and revenue budgets are finished they shouldn’t sit on a shelf collecting dust. To get the best use out of these documents, the board should receive monthly financial reports. “Now it’s time to make the budget work for you,” the CRG training booklet states. “No matter how good your budget is, it won’t stop financial crises, and it won’t help you achieve financial stability for your system unless you use it every month.”

Monthly financial reports should show revenues from various sources and the costs of various purchases. Each of these revenues and expenses should be expressed in terms of how much was projected for the item and what percentage of the total they are. (Worksheets for this and other topics related to budgets are available free on the NESC Web site at [www.nesc.wvu.edu](http://www.nesc.wvu.edu).)

In many states, public organizations such as a water system are required to have an audit every year. Even if you aren’t specifically required to do so, an audit will let you know if finances are in order and provide suggestions for ways to improve budgets and management. An audit will:

- provide independent verification of your system’s financial condition,
- review internal controls and identify weaknesses,
- report financial information in a format understood by lenders, and
- show any items that are not in compliance with federal regulations.

An audit will not determine if someone is stealing from you. If you suspect fraud, you can hire an auditor to do a special audit to uncover theft. The NESC training manual recommends that you rotate auditors at least every three years and that you not rely on your own bookkeepers to perform audits. When you receive a satisfactory audit report from the auditor, by all means let your customers know. Showing that you are spending money wisely is good public relations.

**Plenty of Work (But Worth It)**

Strategic planning and solid budgeting practices are a lot of work—there’s no two ways about it. But the effort will be worth it. And, you don’t have to do it alone.

“If I could offer one piece of advice on planning,” Kindelspire says, “it would be to start now. Don’t try to invent or re-invent the wheel by yourself. If you look up and find that you are alone in your office wondering how to start the planning process, you got off on the wrong foot. Seek out and find your network of assistance sources, whether they are federal or state agencies, the municipality just down the road, or the retired community development director living next door.”

Not only will good planning help your system run more smoothly, but, as a local official, you are responsible for the financial health of your system. Good planning and budgeting mean that your system is meeting its needs now and into the future, that your community can borrow money when necessary, and the funds are secure and expended for the right purposes.

“As a local official,” the NESC manual states, “You should continue to learn about your system’s financial operations and conditions. Assure yourself that the water system has the financial capability to stay in business for the long-term.”

“And don’t ever forget,” Seroka admonishes, “If you’re failing to plan, you’re planning to fail.”

**More Information Available**

Contact information for a number of organizations that help small communities with planning and budgeting may be found on pages 55 and 56.

NESC offers the Community Resource Group/RCAP publication *Small System Guide to Financial Management* as a free product. Call us toll free at (800) 624-8301 or e-mail info@mail.nesc.wvu.edu and request product number DWBLFN40.

NESC also has the training manual *Managing a Small Drinking Water System*. The entire manual is available as are individual modules that address specific topics. Call (800) 624-8301 for more information and pricing. The manual is available on CD.

---

**On Tap**

Editor Mark Kemp-Rye has studied planning at the undergraduate and graduate levels.
Proper Rates
Are Critical for Financial Health

By Mark Kemp-Rye • On Tap Editor

The water mains in Smallville were laid in the early 1900s. The terra cotta pipes were state of the art when they were installed, but now they’re beginning to show their age.

The method for setting water rates probably dates back as far as the distribution system itself. Rates were set so that costs—primarily the salaries of two operators and supplies, such as chlorine—were covered. If a problem arose, the town dipped into the general fund to cover the expense. It had been that way for as long as anyone could remember.

Local politicians learned that to talk about significant rate increases meant sure defeat come election time. They were reluctant to make such proposals. Low water rates satisfied the residents of Smallville, so prices stayed that way and, for a long time, things were fine.

But by the start of the new century, things weren’t fine anymore. Iron and manganese began leaching into the town’s wells, giving residents unpalatable water with an orange or brown tint and staining clothes washed in it. Frequent breaks in the lines resulted in big expenses for the town. Expenses they couldn’t afford.

With no reserve fund in place and customers clamoring for improvements, Smallville’s leaders found themselves in a predicament.

Why bother with rate setting?

While Smallville is a fictitious place, many towns can relate to the scenario described. For a variety of reasons, often political, sometimes economic, these towns have been reluctant to set water rates any higher than the minimum necessary to cover immediate costs. This situation is coming back to haunt communities across the country.

“While the average household water bill of $15 a month generally covers the basic cost of current service,” noted the proceedings of the Futures Forum, sponsored by the U.S. Environmental Protection Agency (EPA) and held in Washington D.C. in December 1999, “it is unlikely to cover the costs of future needs. If a water supplier’s rates do not provide for collection of a depreciation expense or a reserve fund to accommodate future plant improvements, it is questionable how future needs will be met.”

Simply stated, community officials must set rates that reflect the actual cost of water, both now and into the future.

“It is critical that communities put effort into setting rates to ensure that a system pays for itself and all of its true costs,” says Jean Holloway, training manager for the EPA Region 3 Environmental Finance Center (EFC). “If a system doesn’t pay for itself completely, its sustainability over time is threatened due to lack of sufficient revenue. Moreover, it runs the risk of creating ‘rate shock’ when some day down the road, it discovers that it needs to raise rates substantially to compensate for not having had adequate rates for several years.”

“With most rate structures, consumers’ monthly charges vary according to use. Systems start with a basic price for modest water consumption and charge extra for additional use. The difference in the structures is in how systems price additional consumption.”

P.J. Cameon
Rates Have Different Structures

Most communities have a rate structure that falls into one of five categories: (1) blanket, one-charge, or uniform flat rate; (2) descending, declining, or decreasing block rate; (3) ascending or increasing block rate; (4) flat or single block rate; or (5) seasonal rate. Each structure has its inherent advantages and disadvantages. P.J. Cameon, who studied rates for the National Environmental Services Center during the 1990s, analyzed rate structures in this manner.

“The one-charge or blanket rate is applied to every customer, regardless of consumption. A single person consuming 500 gallons of water a month, for example, would be charged the same as a family of six that uses several thousand gallons. Rate experts advise against using such a structure because it provides no incentive to conserve water and does not provide the system with a close match between the cost of providing service and the income from water fees.

“With most rate structures, consumers’ monthly charges vary according to use. Systems start with a basic price for modest water consumption and charge extra for additional use. The difference in the structures is in how systems price additional consumption.

“Using descending rates, a system charges less per unit as additional water is consumed. The charges for extra consumption provide a minor incentive for customers to conserve water, while consumers of large amounts of water (e.g., industry and agriculture) are provided with a volume discount.

“With ascending rates, a system charges more for each unit as use increases. This structure provides a greater incentive for conservation but can hinder industrial and agricultural operations that require large amounts of water.

“Flat or single block rates also involve a per unit charge for water. The unit rate remains the same, regardless of how many water units are consumed.

“A system in a resort area or in an area prone to seasonal droughts may have a seasonal rate. A ski resort may have a tremendous water demand in the winter months but small demand the rest of the year. Seasonal rates would be set higher during the winter months to reflect the cost of meeting increased demand while ski slopes are operating. The rate would be lowered for the rest of the year.”

The most common rate structure, according to an Ernst and Young survey, is the flat rate. The smaller the system size, the more likely it is to have a flat rate. In fact, EPA-collected data show that 85 percent of the systems with 100 or fewer connections had a flat rate. (See the diagram on page 27 for an overview of rate setting.) It is not unusual for systems to have separate rate structures for large-quantity users, such as industrial and agricultural operations. Where water is plentiful, descending or flat rates are often used, providing a discount to these large users.

Ascending structures are gaining in popularity, especially with larger systems and in western states where water supplies can be scarce. This structure has yet to catch on with small systems, though. The American Water Works Association estimates that only about five percent of small systems, regardless of geographic location, use ascending rate structures.

Whatever method your system uses, “replacement of deteriorating infrastructure must be planned for and included as an expense in your rate structure,” admonishes Gary Williams, executive director of the Florida Rural Water Association.

Basic Information Is Needed for a Rate Study

Although the information needed for a rate study varies according to the type of rate structure and customer categories a system uses, most studies will need the following:

- system expenditures (including operating expenses and other “variable” costs, as well as debt requirements and other fixed costs);
- system revenue (primarily income from water bills);
- total number of service connections (including different customer categories);
- annual amount of water produced;
- annual metered sales (divided by customer categories);
- fund balances (balances of all savings accounts and reserve funds); and
- prioritized listing of estimated costs of future maintenance projects and proposed capital improvement projects.

This information may be drawn from a variety of sources, such as the system’s current budget and the budgets for the previous five years. Census data showing community income and housing statistics and engineering reports showing the age and condition of the system can be useful as supporting documents.
How often should you review your rate structure?

Rate setting experts are nearly unanimous in their view that a rate review should be conducted each year. (See the sidebar on page 25 for the information needed to conduct a rate study.) They also agree that an endeavor such as this is best done by a committee rather than by an individual.

Who are some community members that might participate in such a study? Four obvious members are the town clerk, the water plant operator, an elected official, such as a town councilor or county commissioner; and a banker or other member of the financial community. Each brings a unique level of expertise: The clerk can provide data on costs and expenditures; the operator brings knowledge of the system itself; the elected official might address social and political concerns; and the banker has expertise with finance and accounting. If a rate increase is inevitable, it is probably wise to include a member of the community—one who is widely regarded as being fair-minded.

A properly conducted rate review gives the system a good idea how much income is needed to meet expenses, in both the short and long term, and gives a clear idea of how rates should be set to meet these expenses.

While meeting costs is the primary goal of a rate study, there are other considerations. Cameron notes “rates should be structured in such a way to ensure that customers pay equitable fees for the service they receive. The costs involved with providing water to a retired couple, for instance, are different from the costs involved with serving a local grocery store or car wash. The customers’ bills should be proportional to the system’s cost of providing them with service.” (See sidebar on page 27.)

It is also useful to make rate structures as easy to understand as possible. If community members are clear about the structure and the rates, they are more likely to accept them. Unfortunately, small utilities often don’t have the resources to conduct an in-depth rate study and tend to base decisions on old studies or, as with our story about Smallville, no studies at all.

“The problem with using old information,” according to Holloway, is that “decision makers are left to set rates based on what they have been for the last several years or on what surrounding communities charge for the same type of service. The trouble with either of these methods, is not only that they do not reflect the true cost of the service, but the decision makers are left without the documentary evidence that a rate study can provide to convince the consuming public that a change in rates is necessary. In short, they not only lack the information to make a well-rounded decision, they lack the ammunition to sell it.”

Rate Setting Is On-Going, Public Process

According to a 1998 report by Stratus Consulting of Boulder, Colorado, most water customers realize that they are getting a good deal on drinking water and are willing to pay more for it. As rates increase in the coming years to cover the costs of aging infrastructure and tougher regulations, it is undoubtedly useful to know this about consumers. The amendments to the Safe Drinking Water Act encourage public involvement. Indeed, fair and adequate rates won’t happen without input from the community.

Software Makes Rate Setting Easier

There are several software programs available to help utilities set rates. Two have been designed with small systems in mind: Show-me Ratemaker and RATECheckup™. Show-me Ratemaker is a free Excel-based program developed by the Missouri Department of Natural Resources. Ratemaker is designed so that a water or sewer utility can analyze finances and adjust user rates for the future. To download a copy of Ratemaker, go to www.dnr.state.mo.us/oac/emiapps.htm.

The Environmental Finance Center at Boise State features RATECheckup™ software designed to help utilities with rate setting. RATECheckup™ works in conjunction with CapFinance™, a capital improvement planning and financing tool. To learn more about these software packages, write to the Environmental Finance Center, Boise State University, 1910 University Drive, Boise, Idaho 83725 or call (208) 426-4293 or visit their Web site at ssra.boisestate.edu/efc.
A version of this article originally appeared in the Spring 2000 Water Sense. Published between 1995 and 2000 by the National Environmental Services Center, Water Sense was a newsletter covering financial and management issues in the water industry.

Editor’s Note: While the actual calculations involved in setting water rates can be lengthy and complicated, the concept behind the calculations is fairly straightforward. The following summary is intended to be a brief overview of basic rate setting and not an in-depth look at rate calculations. Remember that rates typically must be approved by a state regulatory department or public service commission.

Basic rate setting can be divided into three steps: 1) splitting the system’s annual expenses into fixed and variable costs; 2) establishing an annual base rate; and 3) calculating the block rate for water.

Fixed costs are those that remain the same, regardless of the amount of water that the system produces. Examples of fixed costs include things like insurance and debt service.

Variable costs are those that increase as water production increases. Examples of variable costs are salaries, electricity, and supplies.

Once the annual fixed and variable costs are established, the diagram below shows how basic rates are calculated. Suppose, for example, the Smallville system has fixed costs of $125,000 per year and 750 customers. As shown in the diagram, divide $125,000 by 750 to establish the base rate for each customer — $166.67. Divide this number by 12 to get a monthly base rate of $13.89.

Next, take the total variable costs and divide by the amount of water sold to establish the unit charge. Suppose the system’s variable costs total $72,000 for a year and it sells 100,000 units of water. (A unit is typically 1,000 gallons of water.) Dividing the variable costs by the units results in a unit rate of 72 cents for each unit a customer uses.

Using the example we’ve just developed, each customer would pay a basic rate of $13.89 a month plus 72 cents for each unit (1,000 gallons) of water used. A Smallville customer who uses 6,000 gallons of water a month would see a bill of $18.21.

Remember that this is a very simple example. It does not take into account different customer categories or different rate structures. It also does not provide for a reserve fund or for future capital expenditures.

A list of organizations with expertise in determining water rates may be found on pages 55 and 56. An additional article about rate setting and public service commissions is available on the NESC Web site (www.nesc.wvu.edu).

Calculating Basic Rates in Three Steps

If all customers of a small water system pay the same rate for consumption and all are properly metered, setting water rates can be accomplished with three basic steps.

1) Split system’s annual expenses into fixed costs and variable costs.

2) Divide fixed costs by the number of customer hook-ups to form the annual base rate that every customer pays. Divide by 12 for the monthly base fee.

3) Divide annual variable costs by amount of water sold (in 1,000-gallon units) in a year to find the block rate for water.

In addition to public involvement, Holloway also stresses that rate setting should be viewed as an ever-changing process.

“No water system is static over time in its needs for operational and maintenance revenue,” she says. “Just as your house or your car requires more care and expense some years than it does in others, so does a utility system.

Attention to rate setting is more than just a budgeting method, it is a planning and anticipation method, too. As utilities learn to manage resources and better provide for future needs, they will be more able to accomplish upgrades in their treatment and distribution systems that will protect and conserve environmental resources.”
Board members serve a valuable but often unappreciated role with small community water systems. Whether they are elected, appointed, or chosen, small community water system board members come from all walks of life and form a colorful montage that represents the true picture of rural America.

Unlike larger systems where board members’ roles are limited to typical governance functions, small system board members often have additional management responsibilities, because limited budgets prevent hiring utility management professionals. Granted, many small community water systems delegate some management tasks to operational staff and even grant management titles, but rarely are employees of small systems hired with existing management experience or training. All too often, the management function of small water systems is the weak link between governance (board) and operations (staff).

The consequences of a weak management structure can lead to customer complaints, employee turnover, financial problems, regulatory compliance problems, and ultimately can spiral out of hand. Customers rarely take an interest in their water system nor thank board members for their dedication and service. But when serious issues arise, customers are quick to show their concern and will eventually take action to replace board members if these issues are not resolved. Providing management training to water board members is a proven way to minimize problems and help small community water systems run more efficiently.

The Mississippi Experience

Small community water systems in Mississippi are similar to small systems in other states. According to the U.S. Environmental Protection Agency, in 2000 there were more than 45,000 community water systems (85 percent of all community water systems) in the U.S. that served populations of 3,300 or less (classified as small or very small community water systems). Currently in Mississippi, there are nearly 1,000 small community water systems (84 percent of all community water systems in the state). Board members in Mississippi are no different from those in Massachusetts or Montana—except that those in Mississippi may possess that distinctive Southern drawl.

Similarly, employees of small community water systems in Mississippi are typical of those from other areas. Many of these employees work part-time. Most have previous experience working in other vocations, and few will admit to having any childhood ambitions of working with a water system. Like the board members they serve under, employees of small community water systems are dedicated to the customers they serve. Most are willing to work nights and weekends to solve operational problems. They strive to ensure that the quality of water that is distributed to their neighbors and friends meets or exceeds federal drinking water standards.

The Training Concept

Mississippi did not develop the concept of offering management training to small community water systems personnel. The state has, however, aggressively...
pursued the implementation of several innovative training initiatives to address common management problems. In 1994, Governor Kirk Fordice commissioned a task force to study drinking water and wastewater needs in Mississippi. The task force identified the need for basic management training for water system board members.

David Mitchell serves as the director for the Division of Water Supply with the Mississippi State Department of Health (MSDH). “Over the last 30 years or so, many community water systems were constructed to serve rural Mississippians with safe drinking water,” he says. “While this noble endeavor improved public health and promoted economic development, unfortunately instruction manuals were not given to the boards of these water systems when they were presented with the keys and the deeds.”

After the governor’s task force training recommendation, MSDH fielded a number of calls from concerned board members and employees of Mississippi community water systems. Mitchell recalled one of the more memorable conversations that further underscored the need for management training. “A board member called to express his opinion that board management training was not necessary,” he says. “After listening to him for several minutes and thanking him for his opinion, this gentleman told me that he had proof that his water system definitely did not need any training.

“At this point in the conversation, I became very curious about what type of proof would negate the need for board management training,” Mitchell continues. “The board member then told me that his water system had been doing such a good job that they had not had to raise rates in thirty years. After I asked several questions to determine more about the financial health of this water system, it was apparent that this system was nearly bankrupt.”

Within a year and after some grumbling, compromising, and political maneuvering, water system board management training became state law. As of July 1, 1998, board members of all rural (non-municipal) community water systems and those from municipal community water systems serving fewer than 2,500 must attend eight hours of management training within two years of being elected (or reelected) to the board. The law further stipulates the subjects to be covered (see below) and granted supervision authority to the Mississippi State Department of Health (MSDH). Shortly after the bill was signed, Community Resource Group /Rural Community Assistance Program (CRG/RCAP), Mississippi Rural Water Association, and the Mississippi Water and Pollution Control Operators Association began conducting the mandatory board management training sessions throughout the state.

The Mississippi State University Extension Service (MSUES) was awarded a contract to develop a curriculum to be used by all organizations conducting board management training. The law mandates that the training “shall include information on water system management and financing, rate setting and structures, operations and maintenance, applicable laws and regulations, ethics, the duties and responsibilities of a board member and other information deemed necessary by the department after consultation with the association and other organizations.”

Paige Manning, MSUES extension associate, serves as the program coordinator for the board management training program. She reports that, since 1998, 4,023 board members have completed Mississippi’s board training.

“We are in the process of comparing annual MSDH capacity development assessment ratings of those systems which have had all of their board members complete the training and those which have not,” Manning says. “While this analysis has not been completed, preliminary results indicate that the training has indeed had a positive impact.”

“When people are elected to serve on community water system boards, most do not fully understand their responsibilities and duties,” she says. “This training not only addresses these issues but also enhances their knowledge of basic management practices.”
Training sessions have been conducted in nearly every county of the state and delivered in all-day (eight-hour) sessions, split-night sessions, and even on weekends. The MSDH requires that these training sessions be limited to 30 participants and that all participants complete an entrance and exit assessment, as well as an evaluation of the training. MSDH also requires that the MSUES and the training organizations participate periodically as members of the Curriculum Review/Board Management Training Advisory Committee to discuss necessary revisions, participant comments, and other training issues to improve the quality of board management training.

A typical one-day session starts with an “Introduction to Board Training” video then moves through laws and regulations; duties, responsibilities, and ethics; operation and maintenance; basic management practices; rate setting; long-range planning; customer service; and community relations. The session ends with the assessment and evaluation.

One concern expressed during the governor’s task force meetings—and one that I’ve heard frequently when discussing this training requirement with my colleagues in other parts of the country—was that there might be an unacceptably large number of board members resigning from community water system boards rather than comply with the mandatory management training law. Fortunately, this hasn’t been the case. Although most Mississippi community water system board members were less than enthusiastic and some have even been openly hostile, very few have actually resigned.

Success Leads to Advanced Training

One surprising revelation has been the high percentage of board members who have actually expressed a desire for additional training (although there is no requirement for training beyond the eight-hour basic board management training). More than 56 percent of participants indicated on their board management training evaluations that they would like to have additional training. Based on this information, CRG/RCAP began planning for advanced management training. Rather than exclusively focusing on continuing management training just for board members, the concept included staff members of small community water systems who often share management responsibilities.

In September 2001, CRG/RCAP partnered with the National Environmental Services Center and the MSDH to present the workshop “A Business Approach to Managing Small Water Systems.” A total of 54 small water system board members, operators, and other non-certified staff members attended two separate training sessions. Additionally, representatives of the U.S. Department of Agriculture (USDA) Rural Development, USDA Rural Utilities Services, the MSDH, as well as a professional utility manager and a consulting engineer facilitated a luncheon discussion on water system infrastructure improve-
ments for the workshop participants. This initial pilot training confirmed the basic board training evaluation results that there was indeed an interest by board members and also by employees of small community water systems to further enhance their knowledge of best management practices.

Because of the previous success with the initial advanced management pilot training, MSDH contracted with CRG/RCAP to conduct six additional advanced management training pilot workshops throughout the state between January 2002 and June 2002. MSDH wanted to further gauge participant interest and determine if future advanced management training workshops were viable. CRG/RCAP worked to develop three management training modules (general management, personnel management, financial management) and presented each of these topics over the six-month pilot training contract term. A total of 365 participants, including board members, certified operators, and other non-certified staff, attended 11 voluntary advanced management training sessions at the six workshops. The large number of participants and the positive participant responses helped MSDH determine that voluntary advanced management training was indeed a worthwhile concept. In April 2003, MSDH issued a request for proposals for a four-year contract to conduct 24 advanced management training workshops annually.

Certified, Advanced Management Training

In June 2003, CRG/RCAP was awarded the four-year MSDH advanced management training contract to deliver six independent training modules at eight training sites over two years. (The cycle repeats itself during the third and fourth years.) Six training workshops will be conducted every quarter and concurrent training sessions are limited to 30 participants (maximum of 60 participants per workshop).

At the conclusion of each training session, certificates of attendance are presented to all participants who complete the training, and certified operators are granted six CEU hours (which can be counted toward recertification requirements for certified water operator licenses).

One unique feature of this program is that participants may elect to take a voluntary assessment at the conclusion of each training session. These tests are proctored by MSDH officials and upon getting 70 percent correct on all six tests, MSDH will issue certificates denoting competency as "Certified Waterworks Managers."

CRG/RCAP has conducted 12 Mississippi Public Water System Management Training Program workshops with 18 certified advanced management training sessions during the first six months of this contract. A total of 316 participants have attended the certified advanced management training. Of this number, 221 participants elected to take the voluntary MSDH Certified Waterworks Manager assessments, with 82.4 percent passing these tests.

The three training modules used in the advanced management pilot sessions between January 2002 and June 2002 are being presented this first contract year. (These three modules include general management, personnel management, and financial management.) Curriculum development is underway for the remaining three modules that will include risk management, customer service management, and emergency management.

Part of the Solution

Is management training for board members (and employees) a solution to the problems challenging small community water systems? While this type of training certainly will not solve all problems, it should be considered as a viable approach to empowering the decision makers of small water systems with the knowledge of best management practices necessary for preventing, eliminating, or reducing the impact of significant problems.

If you are a board member or employee of a small community water system, ask yourself if your utility could benefit by you attending management training. During my former job as a water system manager, I wish that I could have been afforded the management training opportunities that are now available in Mississippi. I am sure that many of the mistakes that I made and other problems that arose could have been mitigated if I had completed this type of management training.

Tommy Ricks serves as the state coordinator for the Community Resource Group/Rural Community Assistance Program in Mississippi. Before becoming a technical assistance provider and environmental trainer, Ricks worked as a certified water system operator and manager.
“Hello Mr. Clark. This is Sam Stone, superintendent of the PSD on the other side of the county. I’m sorry to call you at home. You’re the chief operator at the Acme Water Utility aren’t you?”

“Yes sir, I am. I’ve been working there for four years.”

Do they treat you well over there? I mean does the water board give you problems with overtime? How about taking your suggestions? Do they do that? Have they refused to grant your vacation requests because they don’t want to pay a fill-in?”

“We’ll, it’s not a bad place to work, all things considering. It’s just the way things work over here. I always have had to fight with the micromanagers on the board.”

“Yes, I know what you mean. You’re probably glad to have a job, but wish they respected you more. Let me ask you this. Have you thought about what it would be like to work under a board that respects your opinions?”

“Every board meeting I go to.”

“Well, would you consider coming to work for us if I said we work with our employees, not against them?”

By Jamie Knotts • NESC Contributing Writer
As a system manager or water-board member, do you know if any of your system’s employees have had such a conversation recently? If they haven’t, then your utility is probably one of the lucky ones that does not face employee turnover. Water treatment workers are increasingly moving from job to job and system to system as they find better pay and better working conditions at nearby facilities. Many workers leave the water business altogether for different jobs and higher pay in other industries, leaving their system without a certified operator.

Couple a worker’s desire for good working conditions with increasing operator certification demands, and pretty soon a water utility could face an employment crunch. Today’s treatment workers must take courses, pass tests, and spend time on-the-job learning treatment methods so they may obtain proper certification as operators. Hiring someone off the street to be an operator just won’t work under today’s federally mandated certification requirements.

An operator is truly a trained professional with an enormous amount of responsibility.

And let’s be honest, a system’s operator is probably the most important member of a utility’s staff. The operator is key to delivering safe water to customers. In many small systems, the operator is the one repairing leaks in the dead of winter or running the system in the middle of the night so the local fire department has the capacity to fight a fire. The operator does the dirty work others don’t want to.

**It’s Often a Matter of Respect**

Even though many managers and water-board members recognize water treatment operators for the fine job they do, others don’t appreciate the people they have on staff. That lack of appreciation is increasingly the cause for workers leaving their jobs to find employment at another water system or a job unrelated to the water business.

Penny McCoy is a management support technician with the Pennsylvania Rural Water Association. She says there’s a general lack of respect shown to many of the water treatment workers she meets as she crosses Pennsylvania, helping water board and utility managers.

“I’ve seen water board members who look at operators like a bunch of dirty old guys that just come to work,” McCoy says. “They just don’t show them the respect they deserve as highly skilled workers.”

McCoy says that operators’ opinions are often not considered in the decision-making process.

“Operators will tell their water board that ‘we need to change the chemical treatment method to do the job better’ only to hear the board say ‘We can’t do that,’” McCoy says. “But five months later the board pays a consultant who recommends the very same thing. Then they listen. The person who they’re trusting on a day-to-day basis to run their system isn’t listened to when it comes to major decisions that affect the system.”

McCoy says that systems in Pennsylvania are already facing a turnover of certified workers. “The two main reasons for turnover are a lack of respect and a lack of funds to pay the workers adequately,” says McCoy. “And money probably isn’t the biggest reason they [operators] leave.”

In addition to growing dissatisfaction among workers, water utilities will face a growing problem of retirement as the baby boomer generation nears the end of their careers. “In Pennsylvania, I see less than 10 operators under 30 years old,” says McCoy. “Who is going to run the systems when all of those older operators retire?”

Jean Holloway agrees that utility workers deserve more respect. Holloway served in various administrative capacities for several small towns in Maryland before providing technical assistance and training with the Maryland Rural Water Association. She now helps small communities with their drinking water and wastewater problems as a training manager with the Environmental Finance Center at the University of Maryland.

“Workers need to know that they matter,” Holloway says. “They [workers] have to be treated better. They need to be appreciated and respected and have some say in their system. There’s a certain percentage of workers who do their jobs and love it because they are dedicated. They do it for the community. The more appreciation they receive, the more likely they will stay. When a system has a rate study or is considering a new treatment process, those overseeing the project forget to talk to the superintendent and the operator.”

Holloway says some workers just move from job to job or go to private industry because they’ve reached a certain level of certification and can earn more money in another position. “You can’t blame them,” she says. “They have to think about their families if they can earn more elsewhere.”

But Holloway suggests that water systems should try to hold on to good workers if better pay is the only reason a worker is moving on.
“It would benefit the system to raise the pay scale to keep the qualified, trained people already on staff,” she says. “You’ve already invested in their training and education. Why continue reinventing the wheel every time someone leaves the utility?”

“Systems need to recognize the opportunity costs associated with not paying a competitive salary,” says Holloway. “If you added up the cost every time someone left versus paying a competitive or higher salary, the costs of keeping the current worker would probably be less in the long run than spending the money to retrain a new worker to replace the qualified worker who just left.”

Holloway suggests that operators could help to educate water board members about their work by showing them just what is involved in doing the day-to-day work. “Take the board member down to see the cleaning of a clear well to see the onerousness of the job,” she says. “It lets them see firsthand that the work is more involved than just a general laborer’s job and pay dictates.” By doing this, a worker might well lend some credibility to his argument that his work warrants higher pay and more respect.

**Seeing Both Sides of the Issue**

Jim Stutso is in a unique position as a class I operator for War, a small town of 1,000 residents in southern West Virginia. Before running the city’s water treatment plant, he was a town councilman for six years. Because of his time spent on council, he recognizes the financial limitations that a community has in supporting its workers. With a high percentage of elderly residents on fixed incomes, the town doesn’t have the means to offer workers any benefits. There’s no retirement plan and no health insurance. A treatment operator can expect to be paid roughly $7.50 an hour.

“The money for healthcare and other benefits just isn’t there,” Stutso says. “You have to respect the mayor and city council because they are trying to improve the situation, but the money just isn’t there.”

Stutso says that while the city can’t offer the financial incentives to keep workers on the job, town officials are using creativity to help make things better for workers.

“Operator input is good,” Stutso says. “Respect is fine. There isn’t really anything more they could do in that area.”

But in addition to treating workers well, the town does what it can to help employees improve their skills. The town recently sent Stutso to a training session across the state. “They covered my travel expense to come to the training,” Stutso says. “The mayor is a retired educator so he supports worker education.”

The mayor’s interest in education led him to start a program for municipal workers that allowed them to get the general equivalency diploma. Employees who opted for the program were granted leave from their jobs to complete their schooling.

But while the city has tried to work within its means to support employees and keep them on the job, the issue of more money faces War again and again. Stutso says the last guy who left the water system took a job with the nearby county public service district making roughly $8.50 an hour with a retirement plan and hospitalization benefits.

**Tackling Turnover**

Dealing with a turnover rate isn’t a problem that small systems relish. According to the training manual *Managing a Small Drinking Water System: A Short Course for Local Officials*, small systems are especially hard hit with turnover rates because they don’t have the financial resources to lure and retain qualified workers. The training package was developed by training specialists at the National Environmental Services Center. The course suggests that a system can prepare to minimize turnover.

“A small water system’s board members usually know the employees and recognize their motivations for job performance,” the manual states. “Not all individuals are motivated by high salaries. While you should try to provide competitive salaries and benefits, you can also find other reasons to encourage employees to stay.”

The manual goes on to say, “Employees may like flexible hours or a periodic bonus. Find out what motivates each individual. This alone is a sign that you value the employee. Note also that many small systems can take advantage of benefit packages offered by the state’s municipal league, rural water association, and other organizations.”

Another key to retaining workers is how they are managed, the manual says. “Do not micromanage. The operator is responsible for running the water system and knowing its customers. Local officials are free to ask reasonable questions, but they should trust the operator to make day-to-day decisions. Officials make policies to ensure safe drinking water for their community and should respect the
Retaining Good Employees

Often overlooked in the work of running a water treatment system is the cost of employee turnover, a problem plaguing many businesses and governments. Despite the recent downturn in the economy after years of high economic growth, there may be a shortage of people available to work at the entry level in certain areas of the country. The water industry, in general, is expected to hold jobs for the future as it is not as sensitive to economic fluctuations. A water treatment plant will still need operators. Also, with the education needed to obtain increasing operator certification requirements, water industry jobs will likely gain more respect and interest.

Job opportunities in the water field combined with increased mobility in the work force creates an environment where many people feel comfortable frequently changing jobs for a wide range of reasons. A major study of the employee turnover problem in traditionally low-wage retail industries (“New Ideas for Retaining Store-Level Employees,” Retailing Research Council, January 2000) estimated that the total direct and indirect cost of replacing a worker earning $6.50 per hour was at least $3,637. While these specific numbers apply to traditional jobs such as cashiers, similar situations exist for drinking water utility workers due to the high cost of training.

In her book The Road to Retention: Build and Keep a Strong Workforce, Ann Jones states that cost components, such as recruiting, interviewing, hiring, processing, orienting, training, supervising, and overtime paid to employees to cover for the person who left, represent the direct costs of turnover. These direct costs are relatively easy to measure and quantify in dollars. The indirect costs of turnover include the cost of training.

Retention: Build and Keep a Strong Workforce

Strategic Workforce Planning

Increased mobility in the work force creates an environment where many people feel comfortable frequently changing jobs for a wide range of reasons.

Today's workforce does not accept the autocratic “my way or the highway” style of management. Now employees require a participative management style from supervisors. Employees want to be part of the decision-making process, and to have a voice in policies and procedures that will affect them. They want a workplace that offers fair competition and provides outlets for personal creativity. They are attracted to environments where camaraderie with all levels of co-workers is the norm. Hierarchical rank systems, which exclude interactions, are seen as undesirable; systems that encourage and reward teamwork are applauded. Autonomy, dignity, self-esteem, and respect are critical ingredients in today's workplace.

Today's workers expect support for personal development and long-term growth. Many workers are expected to prepare a career marathon, not just a career sprint. They seek on-going training that focuses on lifetime skills, and mentors who will contribute to their individual growth. Each manager plays an important role in shaping the work environment. Managers must be well rooted in the company's philosophy and must understand the company's value system. Not only must they know the values, they must believe in them and support them enthusiastically. How else can they communicate the organization's values effectively to their staffs? The way managers communicate and direct their staff will strongly influence the organization's culture and climate. Even when employees base their service attitudes on personal commitments, the prevailing environment that management establishes influences them.

The Expectancy Factor

Management has a responsibility to be clear and concise when explaining to employees just what it expects of them in terms of accountability and performance. Common sense tells us that you can't hold people accountable for things they did not know they were being held accountable for. In the past, once management communicated its expectations to the employee, the conversation was over. Company goals had been identified. But what about the employees' goals? Workers today want to see a tie-in between the organization’s mission and their own personal missions. An honest look reveals that today's workforce focuses first and foremost on personal goals, and secondarily on organization goals. Their expectancy factor translates into: "If I, as an employee, live up to or exceed the boss's expectation of me and my performance, what can I, as the employee, expect back in return from my organization?"

Quality Treatment

Today's workforce does not accept the autocratic “my way or the highway” style of management. Now employees require a participative management style from supervisors. Employees want to be part of the decision-making process, and to have a voice in policies and procedures that will affect them. They want a workplace that offers fair competition and provides outlets for personal creativity. They are attracted to environments where camaraderie with all levels of co-workers is the norm. Hierarchical rank systems, which exclude interactions, are seen as undesirable; systems that encourage and reward teamwork are applauded. Autonomy, dignity, self-esteem, and respect are critical ingredients in today's workplace.

Lifetime Skills Training

Today's workers expect support for personal development and long-term growth. Many workers are expected to prepare a career marathon, not just a career sprint. They seek on-going training that focuses on lifetime skills, and mentors who will contribute to their individual growth. Each manager plays an important role in shaping the work environment. Managers must be well rooted in the company's philosophy and must understand the company's value system. Not only must they know the values, they must believe in them and support them enthusiastically. How else can they communicate the organization's values effectively to their staffs? The way managers communicate and direct their staff will strongly influence the organization's culture and climate. Even when employees base their service attitudes on personal commitments, the prevailing environment that management establishes influences them.

Adapted from a presentation made by Dr. Marc Clark, President of M. Douglas Clark & Associates that provides services in asset management, electronic media production, public relations, Internet/Intranet Web sites, and employee enhancement workshops.
However, as Jones points out, turnover also creates indirect costs that are less easily measured, but which also negatively affect a business or organization. Some of these less obvious costs are customer dissatisfaction, experience of new employees in handling problems efficiently, decreased quality due to errors, and reduced morale of co-workers who are charged with training another new person.

Each of these components must be measured and understood to appreciate the bottom line cost of turnover and, therefore, the economic value of retaining good employees.

In addition to the obvious dollar cost of turnover, managers or board members should also appreciate the more subtle economic benefit of good employees. Good employees are key to the customer-oriented marketing approach that is critical to keeping customers happy. And happy customers who are treated well by your employees face to face or don’t have to deal with a water supply interruption may be less likely to fight a rate increase when the system needs one.

Recruiting and retaining good employees are challenges in today’s labor market. However, the long-term rewards to water systems for retaining quality employees are well worth the effort.

**Be Creative with Retention**

According to Laurie Dreyer, director of human resources for a company that recruits prospective employees for small businesses and local governments, the secret to retaining employees is to value employees.

Dreyer says she’s seeing businesses that now allow people to pursue their own passions. “If you do things that you love, work isn’t work. It’s a passion. And what could be better than waking up in the morning and going to do something you love? Now this may not always be possible in America, but I highly suggest that organizations try to match a work interest with an employee.”

Another key factor is providing opportunities for people to develop their skills. “We see organizations trying to be future oriented,” says Dreyer. “They’re asking employees: ‘Where do you want to go? What do you want to learn? How do you want to learn it?’”

Dreyer says organizations now provide tuition reimbursement, in-house courses, and skill development through assignments to different types of projects. “I see companies willing to move people around based on what their passions are,” she explains. “If a city clerk wants to move to the police department or payroll office, governments need to work with that employee. The alternative is that the employee will likely look elsewhere for a job if he or she knows the local government isn’t keen about moving employees.

**Key Management Principals for Retaining Employees**

1. **Management is a Role Model**

   The impact a manager has on an employee’s perception of the work is everlasting. Either the manager is held in high esteem or not. It is surprising to think that to employees, a manager can be the greatest mentor they have ever known or the worst. Managers must realize that they are being evaluated by the employees they supervise. It is important to understand that what managers do often communicates values more strongly than what they say. If the organization suggests one set of values, managers must not work under another.

2. **Create a Work Environment Where Workers Feel Secure**

   Establish a work atmosphere where the sum of the individual parts is greater together then if they stood alone. Workers today have a desire for fewer social divisions by rank. The most successful work areas are those in which workers feel a common bond with others in their peer group. Workers tend to migrate toward those individuals who share similar feelings, opinions, and attitudes. To be secure in their work environment, people need personal contact, friendship, and the feeling of belonging. If they feel they are a third party outsider or don’t belong, they don’t stay. A team structure supervised by participating management is the answer. Interactions within groups strengthens the group.

3. **Treat Workers With Dignity**

   Every employee in your organization is worthy of your respect. Each deserves to be treated as an adult and not as a piece of equipment. Management must be familiar with each staff member to know what makes them tick and what brings satisfaction to them in the workplace (rewards other than pay). Sensitivity is a must characteristic for the supervisor of the future; the norm will be for managers to be sensitive to workers’ needs, wants, and personal expectations. A positive side effect of sensitivity, both for management and employees, is the identification and best use of employees’ special talents. Knowledge also allows managers to support workers’ creativity and resourcefulness, as well as respect- ing employees cultural and personality differences.

   The biggest gift managers can give their staff members is a dose of self-esteem. Workers need to be convinced that whatever position they hold, whether billing clerk, meter reader, laborer, water operator, maintenance engineer, or general manager, their contribution is important to the success of the utility. They must also come to believe, through strong orientation/reinforcement programs, that they, as individuals, are important to the organization’s success. The mindset of the worker should be one of pride in position and in self. They must not feel like interchangeable, replaceable clones just doing the job.
“The worst thing a supervisor could do is to an employee’s attitude about his or her job is pigeon-hole that employee into only one job category,” says Dreyer. “Poor supervisors seem to think, ‘Well, Luke has always been a laborer, and he could never be anything else.’ The reality is that Luke probably would love the opportunity to move up and into another higher-paying position. The only thing holding Luke back is the supervisor who can’t see his way around a current job title.

“It’s sad to say, but many poor employers or supervisors focus on the current rather than on the future capabilities of an employee,” says Dreyer. “They’ll probably spend time and money recruiting for outsiders for a position and never once consider the talent they already have in house.”

Benefits and Employees

With the current economy, business and government are recognizing that the workforce is highly mobile, with many workers jumping from job to job throughout their lifetimes. To discourage job mobility in a productive worker, employers must be willing to be flexible to the specific needs of the worker.

“Giving prospective employees what they want—within reason—is critical,” says Barbara McCarthy, a human resources specialist for a “head-hunting” firm that locates workers for specific jobs and then tries to entice them into switching to another company.

McCarthy says that many employers now offer benefits packages that consider the needs of employees of different ages. “What a 20-year-old needs is very different from someone with a family and kids and very different from someone who’s getting ready to retire,” says McCarthy.

Thus, firms, and even local governments, are offering flexible benefits packages suitable to an employee’s present stage of life.

One benefit that seems popular across the board is a paid time-off policy. Sick leave and vacation days are not defined. Employees are given a lump sum of days off to use as they wish.

McCarthy explains the attitude: “You’re adults. Here’s your time. Go do what you want. You don’t have to give me a doctor’s note.”

Flexibility and coping with change are key factors in keeping and retaining good employees in today’s workplace, says McCarthy. Even with some businesses’ low turnover rate, some employees do leave—and about 10 percent of them come back.

“We encourage employers to give them an Australian boomerang when they come back,” she said. “It’s a time of celebration. An employee who left, perhaps to improve his or her skills or dealt with a family situation, should be welcomed as a valuable part of the group.

“You went out, you learned something, and you decided this was really where you wanted to be,” she says.

Board Members and Staff

Mike McNulty, executive director of the West Virginia Rural Water Association, says that water systems are going to continue to see employee hiring and retention problems in the future. How managers work with—or against—their workers could go a long way in alleviating or compounding the problem.

“With the training and education requirements that are coming, small communities are going to find it harder to find the workers they need to run the plant,” McNulty says. “The war cry I hear is money. The problem is that many people don’t see civil servants like operators in the best light. They don’t see them as being professionals with an enormous amount of responsibility.

“Some boards think their role is to micromanage,” he continues, “and that is not their job. If you hire a general manager to do the job, then let him or her manage. The board should be there to check off and approve the general manager’s work or recommendations.”
At a time when many new regulations coming out of federal and state capitals are posing more stringent accounting and financial reporting requirements, it is imperative for utility systems to evaluate how their financial management measures up to meeting these new demands. Small systems face problems unique to their limited capacity and budgets. However, with thoughtful planning, most systems may find they’re fully able to meet not only the regulatory requirements but the needs of the decision makers to whom they’re most immediately accountable as well.

For many small systems, one, two, or three people may be all there is to manage the entire operation. In some cases, one person serves as the system operator, performs financial and reporting duties, and handles public relations. In these situations, bookkeeping and accounting often get minimal consideration and are handled only on an as-needed basis. Little time or effort is spent on keeping data current, and no analysis is performed on what can be the most important information a system has for making both operating and strategic planning decisions.
With the help of some experts in the field, I have compiled ideas and suggestions for working with the most common financial management challenges small systems face. Each of the following practices is fundamental to not only efficient operations but to the longevity of the system. While implementation of one or more practices is better than not doing anything, it is the synergy of all that makes for true operational effectiveness.

**Accounting Dos and Don’ts**

Keep a separate, commercial checking account. Record all system-related revenues and expenditures in this account. I’ve heard hair-raising stories of operators running revenues and expenses through their personal checking accounts. This leaves the system wide open to fraud and embezzlement, at the very least.

Record financial information in a timely manner. Revenues and bills should be recorded at least monthly, if not more frequently. Failure to do so often leads to a loss of accuracy—or worse. When the time comes to record the information, much detail has been lost or forgotten. Revenues must be tracked and classified according to whether they are service fees, penalties and interest, or reconnection charges. Expenditures need to be entered into an accounting system that classifies and tracks them according to their nature as operating expenses, capital asset acquisition, or reduction of liabilities. Often the only report provided to the governing board is a list of checks and the payees with no other information identifying the nature of the payments. Rate setting and long-range planning for capital improvements can only be done effectively with accurate, properly classified information on where the system is spending its money.

Use a consistent accounting basis. Most systems record all transactions on a cash basis. While this is easier to use and to understand than accrual accounting, it seldom reflects the system’s true operating costs. Expenses, such as insurance and depreciation, are often booked only once per year, and it’s difficult to analyze and set monthly rates if these types of expenses aren’t amortized on a monthly basis. If revenues are received and booked after the expenses they were billed to recover, decision makers can’t get a true picture of whether those revenues are sufficient to cover operating and capital needs.

Recognize the value of trained accounting staff. Many small systems can’t afford a full-time accountant or they fail to recognize the value of having timely, accurate financial information. If the system is too small to support more than the operator and a clerk, every attempt should be made to pay for a monthly checkup from

---

**Accounting Glossary**

| **Accrual Accounting** — A system of accounting in which revenues and expenses are recorded as they are earned and incurred, not necessarily when cash is received or paid. |
| **Cash-Basis Accounting** — A system of accounting in which transactions are recorded and revenues and expenses are recognized only when cash is received or paid. |

| **Aged Accounts Receivable** — The process of categorizing each account receivable by the number of days it has been outstanding. |
| **Chart of Accounts** — A list of ledger account names and associated numbers arranged in the order in which they normally appear in the financial statements. The chart of accounts is customarily arranged in the following order: assets, liabilities, owners’ equity, revenue, and expenses. |

| **Amortization** — The process of cost allocation that assigns the original cost of an intangible asset to the periods benefited. |
| **Depreciation** — The process of cost allocation that assigns the original cost of plant and equipment to the periods benefited. |

| **Capital Asset** — A long-term asset that is not purchased or sold in the normal course of business. Generally, it includes fixed assets, e.g., land, buildings, infrastructure, equipment, fixtures, and furniture. |
| **Full-Charge Bookkeeper** — A person with comprehensive accounting skills, including compiling the data into the general ledger and preparing financial statements. |

| **Liabilities** — Obligations measurable in monetary terms that represent amounts owed to creditors, governments, employees, and other parties. |
| **Operating Expenses** — Costs incurred in the normal course of business to generate revenues. |
a certified public accountant or other professional trained in full-charge bookkeeping skills. An annual audit or review may be necessary to satisfy many lenders’ eligibility requirements.

Invest in a decent billing system. Often an untrained clerk makes the decision about what billing system to use. This is such a critical element of any accounting system that professionals should be making the decision after an analysis of the options, keeping in mind what is affordable for the system. Critical to revenue and billing management is a system that can generate an aged accounts receivable report that breaks out receivables and shows how much is due 30, 60, 90, or more days late. Ideally the billing system can classify and report revenues due from water versus sewer and other services provided. Without aged receivables, the board has no way of knowing whether or not the revenues collected reflect what is due and whether additional steps need to be taken to improve collections. It is this report that also helps determine whether and how much to book as an allowance for bad debts.

Recognize the importance of board training. Members of the utility oversight board, who are often volunteers, may need assistance in making well-informed decisions. They may need training to understand the big picture as well as how to use the information provided to plan for the best long-range interests of the system’s customers. Board members can often find training through a state’s department of health or environmental services and through non-profit organizations such as the Rural Community Assistance Program (RCAP).

Furthermore, complete and accurate minutes should be kept of all board meetings in the event that the board’s actions are ever called into question and to have as a reference in reconstructing the age and costs of system upgrades and improvements. (See the article “Get on Board: Water System Management Training in Mississippi” on page 28 for more information about board training.)

Adopt an asset management plan. Even something as simple as putting paid receipts for capital acquisitions in a single file folder can help distinguish capital expenditures from operating expenses. Sources such as existing records, construction plans, work records, and the institutional memory of existing staff can be used to determine the actual age of meters, valves, water mains, hydrants, pumps, motors, treatment plant equipment, and other assets. The more accurate the listing of the system’s infrastructure, the more reliable the financial statements and the capital improvement planning of the small utility will be. With the implementation of Government Accounting Standards Board (GASB) Statement 34 requirements for small towns and their enterprise funds, asset management has become even more important as it has been incorporated into many regulatory requirements. (See the article “Taking Care of What You Have: Asset Management from Theory to Reality” on the facing page for more information about asset management.)

By examining each of these potential problem areas, decision makers may find that solutions aren’t hard to find or afford. The key is to get started now. Failure to keep records and evaluate available information can lead to problems beyond the scope and capability of those responsible for providing a safe, reliable service to their constituents.

Acknowledgement

The author wishes to thank Linda Sims, CPA, a technical assistance provider with the Southeast Rural Community Assistance Project in Roanoke, Virginia; J. Bruce Fox, executive director of the Huntington (West Virginia) Sanitary Board; and Mark Rounsavall, program director for Community Resource Group, the Southern RCAP for their advice and assistance in composing this article.

Harriet S. Cutshall, CPA, is the finance director of the Rural Community Assistance Program, Inc. (RCAP) where she oversees the organization’s accounting and financial management and reporting, devises and administers the annual budgets in cooperation with the executive director, and oversees the development and maintenance of the RCAP data collection system with the six regional RCAP offices.

Software Solutions

Accounting software usually provides a draft of a chart of accounts that may be tailored to fit the system’s individual needs. Even inexpensive, off-the-shelf small business software now offers the procedural tools that allow the small utility to keep a purchase order system that will help control costs. Intuit makes two affordable accounting programs: Quicken and QuickBooks. Quicken is designed for managing personal finances and is not recommended for businesses that must manage balance sheet accounts, such as cash, inventories, accounts payable, and loans outstanding. Peachtree, owned by Best Software, is an affordable package that has both a basic inventory function as well as job cost to help the system begin to track fixed asset and construction costs. In addition, anyone with basic skills in using a spreadsheet program, such as Excel or Lotus, can devise a tracking system that is easy to manage for small systems that don’t have extensive asset lists.

Some affordable billing systems to consider include: RVS (see www.RVSSoftware.com or call 800-227-9195); and Greentree Applied Systems, Inc. (see www.greentreeky.com or call 800-928-6388). A system that provides a rate-testing capability based on average usage by rate code for at least the preceding 12 months will let you test different rate scenarios to calculate revenue generated by proposed rate changes. Whatever you choose, be sure to invest in proper training for the staff who will be using the software.
Taking Care of What You Have

Asset Management From Theory To Reality

By Natalie Eddy • NESC Staff Writer

Asset management: It’s a simple concept. Know your assets—equipment, pipes, machinery, and supplies—to ensure that you meet your service needs at the lowest possible cost to your community. The difficult part for many small water systems is implementing a plan for managing these assets, including their repair and replacement.

The federal government has invested billions of dollars in drinking water infrastructure and, therefore, has an inherent interest in protecting those resources to make sure that future funding is directed toward utilities that are built and maintained to meet regulatory requirements.

Additionally, drinking water facilities are facing potentially significant investments over the next 20 years to upgrade aging infrastructure. The projected needs range from $154 to $446 billion, according to the U.S. Environmental Protection Agency (EPA). The American Society of Civil Engineers states that U.S. drinking water systems are responsible for maintaining an estimated 800,000 miles of water delivery pipelines.

As one way to address this situation, Congress may require utilities to develop comprehensive asset management policies. In fact, many utilities have already taken it upon themselves to create such a plan.

Asset Management ABCs

Steve Allbee, director of EPA’s Gap Analysis—a project that seeks to identify the difference between available funds and necessary infrastructure repair—says there are different schools of thought concerning asset management that range from “how to operate your facilities better to something much more than that.”

He adds, “I think where the country needs to go is toward a very broad definition of asset management. If you were running this as a business, how would you do it? That means considering yourself with managing the assets from the point of envisioning the asset to the point when the asset is no longer required for any type of service. It just makes common sense.”

Allbee says asset management principles should be applied to large and small systems alike.

“A lot of small communities are faced with really difficult economic challenges in terms of putting in place their assets,” says Allbee. “So they even have greater pressure on them. In addition, they typically have a limited tax base to pay for the higher unit costs and the difficulty of attracting and maintaining system operators to incorporate more advanced technologies.”

Given the nature that all assets, at one time or another, will fail, Allbee says that managing failures is the key. He added that it is essential for small, rural communities to know what they have, understand its condition, and know what is most critical to meeting service requirements to make sound judgments on investment priorities.

“Let’s say there is a relatively small but growing system, and there are requirements being placed on it to serve an additional population,” Allbee says. “There is a considerable cost associated with serving that additional population, but by bringing forward various demand techniques, like installing low flush toilets and low flow showerheads, the system operator can reduce per capital demand and perhaps avoid or defer having to build that new asset for an extended period of time. If you can take steps that allow you to maximize the use of your existing assets, all of those things work in the economic favor of the community.”

Benefits and Challenges

A March 2004, U.S. General Accounting Office (GAO) report outlines how asset management can help utilities better identify needs and plan for future investments. GAO lists some of the benefits of the plan as improved decision making about capital assets.

“In particular,” the report states, “utilities are using the information they collect to allocate their maintenance resources more effectively and make better decisions about whether to rehabilitate or replace aging assets.”

The report also notes that an asset management plan fosters information sharing across departments and encourages coordinated planning and decision making.

Another advantage is improved relationships with
stakeholders, such as governing authorities, rate payers, and credit rating agencies. “For instance, several utilities have used, or expect to use, the information collected through comprehensive asset management to persuade elected officials to increase user rates to help pay for needed improvements in drinking water,” the report adds.

Despite the advantages, the report also notes some challenges. Collecting and managing needed data can be difficult when the existing data is incomplete or inaccurate. And, like in many businesses, making the cultural changes that are needed to integrate the information can be difficult. Also, the short-term focus of governing bodies can hinder long-term planning efforts.

Getting Started

The first place to start when implementing an asset management plan is defining what an asset is and how it should be viewed. “The way to think about an asset is it’s a physical facility or component of a physical facility that has a value that enables a service to be provided,” says Allbee.

As with all things, though, these assets have a life expectancy. Things wear out and things break on a regular basis.

“Typically, you don’t set about consuming assets,” he adds. “The idea is not to consume an asset, but to be able to sustain that service level in perpetuity. Unlike if you buy a computer and use it for X period of time, it becomes antiquated. You throw it away and buy a new computer. An asset is not approached like that. It’s a whole series of component parts that you’re trying to sustain. In essence, you’re trying to sustain that pipe, sustain that plant, and sustain those pumping stations forever.”

EPA has several resources available to small community drinking water systems. Allbee recommends that operators begin with a handbook titled Asset Management: A Handbook for Small Water Systems. Worksheets and samples are provided, as well as case studies. Potential sources of financial assistance to drinking water systems and several EPA resources are listed by region.

EPA is also planning eight to 10 introductory-level training sessions for fall 2004 that will continue until spring 2005 at sites yet to be determined.

Allbee reports that EPA is working with the Water Environment Research Foundation to create a Web-based information system this fall that will enable people to get a lot more information on the tools and practices of asset management online.

“There’s a tremendous amount of information that we’re going to organize and make available. Training and information play a major role in accomplishing these objectives on the part of the community,” Allbee says.

“Traditionally, what the operator had to do and what the operator was very, very good at was the core set of functions that they confront in terms of actually running a facility,” he continues. “Now you’re into a whole set of additional requirements for them to really become expert in this subject. Part of asset management is business management skills and part of it is information management skills. We’re placing a lot more expectations on the people who run these facilities to become really good at all of this.”

Coming Trend

“The change that is evolving in this industry is coming very, very quickly right now,” Allbee says. “A couple of years ago, you could have probably narrowed the number of communities adhering to asset management practices to a relatively small number. Today, there are 10 times as many people focused in this direction as there were a year ago. In another couple of years, there will be 10 times as many as there are today.”

Allbee said the reason for this is the scale of the challenge that lies ahead for communities. “Better approaches have to be found. They can’t stay where they are,” he adds. “This is a major challenge. It’s not going to be easy. The issue that you have here is really very significant, and it’s not going to be solved over a short period of time.

According to the U.S. Environmental Protection Agency, there are five steps in an asset management process:

1. Take inventory. Before you can manage your assets, you need to know what assets you have and what condition they are in. List the condition, age, service history, and useful life of each.

2. Prioritize your assets. Because most water systems have a limited budget, prioritizing assets will ensure that funds are allocated for the rehabilitation and replacement of the most important assets. Ask how important is this asset and how soon will it have to be replaced?

3. Develop an asset management plan. Plan for the rehabilitation and replacement of your assets, including estimates of how much money is needed annually to maintain the operation of the system. Ask local contractors and businesses for estimated costs. Contact neighboring systems about their costs, and discuss this with your state, tribal, or local technical assistance organization.

4. Implement the asset management plan. Once the annual budget is estimated, work with regulators and customers to determine how much additional funding will be necessary. To meet the need, consider creating additional reserve accounts, forming partnerships with other systems, increasing rates, or applying for financial assistance.

5. Review and revise the asset management plan. Once the plan is in place, view it as a flexible document to help you evolve and gain more information as priorities shift, and review it annually.


“There was never an idea that grant programs would sustain us forever. There was always an idea that the government would provide grants to help people get to a certain level of infrastructure, but that, eventually, they would have to reach for an approach that would afford sustainability of that infrastructure.”

For more information, contact Allbee at (202) 564-0581. EPA’s Asset Management: A Handbook for Small Water Systems is available online at www.epa.gov/safe_water/smallsys/pdfs/guide_small_systems_asset_mgmnt.pdf.

A member of the National Environmental Services Center staff for 14 years, Natalie Eddy has written on a wide range of water and wastewater topics.
**Catching Flies with Honey**

**Tact Helps You Collect What’s Past Due**

By Kathy Jesperson • On Tap Associate Editor

Anytime you sell or service something on credit, you will eventually be faced with the inevitable: collecting past due accounts. No one wants to be the bad guy in this situation. But you need to collect the money that’s owed to you so that your own operating expenses don’t find their way to someone else’s collection department.

However, collection practices don’t have to cause you to resort to strong-arm strategies. The key to collecting past due accounts is to use tact. As the old saying goes: “You can catch more flies with honey than you can with vinegar.”

**Tact Works Best**

According to Joseph Arkin, certified public accountant, in a December 1996, *Water Conditioning and Purification* article titled “Collecting Past Due Accounts — Tactfully,” if you have some customers who typically pay on time and then mysteriously become past due on their payments, they may be experiencing “unforeseen and unavoidable” financial problems.

“Their intent to pay on time exists, but their financial ability to pay on time evaporates,” explains Arkin. A sympathetic phone call to these customers to inquire about the problem in a nonconfrontational manner may result in a payment plan that satisfies you both. “The point here is not to assume that the customer is a ‘deadbeat.’ The old adage, ‘Put yourself in their shoes,’ works well in this situation.” Remember: tact.

**Giving a Little Advice**

“Give the customer every benefit of the doubt,” says William Richardson, utilities engineer, South Carolina Public Service Commission (SC PSC), adding this advice:

- offer a deferred payment plan, such as giving the customer up to six months by paying one-sixth of the arrears, which may include the late payment charges plus the current bill;
- send the customer at least two notices before disconnection: a 10-day notice followed by a two-day notice;
- give the customer the opportunity to have a third-party notification; and
- before termination, a company could furnish a list of state agencies, churches, and other organizations that offer assistance to those who need it, so they can keep their utility services on.

“We [the SC PSC] believe and agree that rules have to be written, policies have to be followed, and that they have to be applied fairly and evenly,” says Richardson. “But, somewhere in there,
A compassionate and understanding attitude should be reflected in all of your collection procedures, including collection letters. Arkin notes in his article that “a positive approach to collecting past due accounts is imperative and an often used approach is the collection letter.” He does warn that many slow paying customers will pay little or no attention to these letters. Often, these folks view collection letters as something to be ignored. However, the majority of your customers will respond to a well-thought-out and well-written collection letter.

“It is a good idea to have several on hand so that the letters appear ‘fresh’ and not, as some slow paying customers believe, merely a ‘canned’ administrative response,” writes Arkin. A good collection letter should:

• never be confrontational;
• briefly explain the nature of the problem, such as how much the past due amount is and how long the bill has been outstanding;
• politely ask for prompt payment or some form of notification if the customer cannot pay and to let you know why so that some alternative payment plan can be created;
• explain your system’s termination policy; and
• offer resources that help those who need assistance in paying their utility bills.

Termination, the Last Option

Once all avenues have been exhausted, termination is sometimes the only alternative. But before a utility terminates a customer’s service for non-payment, there are several things it must consider. “Past due accounts can be terminated, but there is a procedure in place that requires a series of notices that must be issued to inform the customer of the utility’s intent and timing,” says Dan Bagnes, analyst, Utah Division of Public Utilities.

“The [public service] commission [in Utah] requires that water utilities offer a deferred payment arrangement (DPA) before terminating service,” Bagnes explains. “Under a DPA, a customer agrees to pay his current bill plus an agreed upon percentage of his past due bill (plus interest) each billing period until the past due amount is paid off. If a customer fails to make a payment under the DPA, the division cannot prevent the utility from terminating service. The utility can allow the

In Arkansas, the public service commission spells out what a utility’s shut-off notice must contain. Though specific to just one state, the content is typical for notification requirements in other states:

1. The title “Shut-Off Notice,” “Cut-Off Notice,” or “Disconnect Notice” in type at least one-quarter inch high;
2. The name and address of the customer and the address of the service, if different;
3. The reason for suspension and any overdue amount;
4. A clear statement of what to do to avoid suspension;
5. The date after which the utility will suspend service unless the customer takes appropriate action;
6. A statement that, “you may qualify to pay your bill in installments and avoid shut-off, but you must contact the utility’s business office by the close of business on the last day to pay printed on this notice and ask for a delayed payment agreement”;
7. A statement that a residential customer who has a serious medical condition, is 65 or older, or is handicapped may contact the utility about qualifying for delaying suspension;
8. What it will cost and what a customer will have to do to get service reconnected;
9. How much the customer can be charged if utility personnel must go to the premises to collect the bill;
10. The telephone number and address of the utility office where the customer may pay the bill, make payment arrangements, or make a complaint; and
11. A statement that any customer with an unresolved complaint may contact the Arkansas Public Service Commission. The statement shall include the commission’s mailing and street address and local and toll-free numbers.
customer some leeway if payment is missed due to extenuating circumstances.

“In its dealings with utility customers with past due bills, the division often explains that unpaid bills by some customers result in larger bills for all other customers who, in effect, end up paying for the service of these others,” says Bagnes. “Some customers recognize the fairness of this explanation, which applies especially for small water companies; others don’t respond to anything but threat of termination—and tact doesn’t seem to help.

“It should not be forgotten that customers request service and are expected to pay for the service they receive,” he continues. “A delinquent bill is often an indication of a customer’s financial difficulties, and the utility should treat all customers with patience and respect.

“Customer representatives should be as tactful as possible. But just like the customer, the utility needs to pay its bills and can have financial difficulties, as well, if too many customers’ accounts remain delinquent.”

And termination can be a very powerful tool, explains Bagnes. Nothing else can state your case with quite the same effect.

**Pay Your Own Bills**

Delinquent accounts can sometimes leave a utility in the red. “Small utilities often operate on a shoestring budget and have difficulty paying their bills,” says Richardson. “My advice would be do not go to the regulator for a rate increase until you have used all of the channels afforded you. Look through your state’s service regulations or rules and regulations governing service supplied by the utility. These rules are issued and approved by the regulatory utility commission or board of directors and include such guidance as requiring customer deposits, collecting late payment charges, and reconnect charges.”

Remember to check the legality of your collection practices. “A simple answer to legality is this,” explains Richardson, “if it’s in the state or federal code of laws or the rules and regulations approved by the regulatory agency, then it is legal. It may not be legal to discontinue or deny service for things, such as failure to pay for merchandise purchased from the utility, for non-payment for service by a previous occupant of the premises to be served, etc.”

**Stay Positive**

According to Arkin—and it’s just common sense—“a supplier has a legal right to be paid for consumer credit purchases.” But there’s no clear criteria that govern how to collect past due accounts while still maintaining customer good-will. That part will be up to you. Just remember to follow your state’s guidelines and try to maintain a positive approach.

For more information about your state’s termination and collection guidelines, view the Web site of state public utilities commissions put together by the Consumer Information Center of the U.S. General Services Administration www.pueblo.gsa.gov/crh/utility.htm.

The Public Service Commission of South Carolina has a Web page at www.psc.state.sc.us that contains all of its rules and regulations governing all of the disciplines, a “bill of rights” for customers, and much more useful information.

A version of this article originally appeared in the Fall 1999 Water Sense. Published between 1995 and 2000 by the National Environmental Services Center, Water Sense was a newsletter covering financial and management issues in the water industry.

“We [the SC PSC] believe and agree that rules have to be written, policies have to be followed, and that they have to be applied fairly and evenly. But, somewhere in there, compassion and a view of the individual circumstances of the customer have to be taken into account.”

William Richardson, utilities engineer, South Carolina Public Service Commission
Planning for tomorrow’s problems may not be the easiest thing to do when a water system is trying to meet today’s needs. But when that problem is a lawsuit against the utility or a worker’s injury claim, having a backup—or more specifically insurance—is a must, even for small systems struggling to contain costs and stay within a budget.

Some utility boards and administrators mistakenly believe they are exempt from lawsuits because they are a public entity. Consequently, they don’t see insurance as a necessary expense. How wrong they are. Small utilities can and have been successfully sued.

**What insurance should systems have?**

Lisa Ross of the Oklahoma Rural Water Association (ORWA) says that at a minimum a utility needs three kinds of insurance. “What is necessary is the general liability, errors and omissions, and bond coverage. Those are the three things that every system should have. Not all systems have property, so property insurance may not be necessary.”

Liability insurance covers the risk of incurring legal liability to pay money damages. This insurance guarantees financial protection for a utility that might be required to pay damages resulting from legally negligent conduct.

The negligent act might cause personal injury, death, or property damage. Liability for negligence may result not only from the conduct of the utility, but also from the conduct of the utility’s agents and employees. Liability insurance is sometimes called third-party insurance because the insurance company protects the insured against suit by a third party, that is, the claimant.

Errors and omissions insurance, sometimes called professional liability insurance, is coverage for claims arising out of actual or alleged breach of duty, neglect, error, misstatement, wrongful hiring or firing, sexual harassment, or financial impropriety committed by the board in providing water to customers. This insurance covers areas...
of business where general liability coverage does not. It often covers defense costs and charges and expenses incurred from claims or suits filed against the utility’s board or officers.

Bond insurance covers money and property loss as a result of dishonest or fraudulent acts by employees. Such dishonesty might include theft of property, disappearance and destruction of property, stolen money, or cashed checks.

**Covering Employee Healthcare**

Scott Johnson of Benefit Management Strategies, LLC in Overland Park, Kansas, is an agent providing coverage to approximately 50 drinking water systems across the country. He says that small systems find it difficult to afford worker’s health insurance.

“Smaller water systems find it very difficult to bear the cost of these (health insurance) programs,” he says. “Many systems tend to have older employees and the rates for these employees are moderate to very high. Older employees can increase the cost of insurance roughly $200 to $400 per employee per month.

“Generally, water systems are small groups having under 10 employees and so they are limited in the options they have. In most cases, employers choose benefits for the employee.” He says employers have a wide range of deductible and co-insurance options they can choose from, but the rates are set by the state, so most agents have little room to offer discounts.

“Rates are controlled by state and when you get a quote from me, you get the best quote I can give.”

Johnson says that states adopted laws in an effort to control costs. The laws are not the same in all states and are usually administered by each state’s department of insurance.

“The laws were passed for two reasons,” he says. “They felt by leveling the playing field, if you offer it, anyone can get it. They also thought that by limiting what insurance companies could write up in policies, they could control the rates, as sort of a community rating concept. What it’s done is drive insurance companies out of the business, giving less choices of providers to water utilities and others.”

Johnson says workers want health care coverage in their benefits package. “Utilities are getting more and more pressure to offer this to their workers,” he says. “It’s a cost squeeze that employers are facing in trying to cover the cost.

Health insurance rates are going up roughly eight to 12 percent a year, and this only adds to this pressure.”

For a utility that wants to offer health care insurance, but can’t afford it, there is one option they can investigate. “Systems can offer to reimburse employees X dollars per month to reimburse them on health insurance the worker buys,” he says. “It allows the system to control the cost by giving a flat contribution per month.” The employees would cover any additional costs.

Johnson says this option is not without controversy. “Some systems are doing this but it becomes discriminatory to a point in that the healthier employees get the best rates and the older employees get the higher rates,” he says. “The older employees can’t afford the coverage even with the utility’s reimbursement, so it becomes a problem for management to consider ‘do I offer any insurance?’”

What’s the best way to find providers?

Alan Ice of WesBanco Insurance services, Inc., in Shinnston, West Virginia, says that water utilities shouldn’t have trouble finding a good insurance provider. “Most commercial agents can write coverage for small systems,” he says. “It’s not complicated to write policies. It’s open and shut.

But while price is a consideration, service is still the most important aspect.”

He suggests that managers check with other water systems to see who they are using or check if the state insurance commission recommends or offers a list of agents in a particular area. Looking through the yellow pages of the phone directory is also an option. One unique feature managers should consider when choosing an insurance provider is how some states handle their worker’s compensation insurance.

“In most states, workers’ compensation will be part of the insurance package that they must consider,” he says. “But West Virginia is one of five states where it is
Health care coverage is a tremendous expense for small water systems.

monopolistic in that the state offers the policy. Utilities have to go to the state board to buy that coverage separately."

Ice echoes Johnson’s feeling that health care coverage is a tremendous expense for small water systems. “It is one of the biggest expenses they have outside of salary.” Ice recommends that utilities thoroughly compare insurance providers to get the best rates. “Each insurance company will vary from state to state,” he says, “and that means that coverage is going to be very local.” He notes that joining a health maintenance organization (HMO) may be something to consider. “A system needs to do a lot of research to get the best possible cost and coverage.”

Reduce Costs

Penny pinching water boards wanting to reduce insurance costs do have a few ways to save money.

“Water systems are not much different than anyone else,” Ice says. “They can opt for higher deductibles on vehicles and other coverages.” He recommends that utilities need to construct buildings within fire codes to keep prices as low as possible. He also suggests that system managers take a close look at their insurance claims because fewer claims keep insurance costs down. Competitive bidding of insurance providers is also a way to possibly reduce costs. “It is important that an agent make a presentation and show both his knowledge of his product, and most importantly, his knowledge of the client’s operation,” Ice says. “The lowest price is not always the best buy.”

Ice says that it is possible for training to help reduce cost, “but for most water systems, employee skill level is controlled by state mandates and they almost have to have the training to do the job anyway.” He does note that defensive driver training is an important measure that can help lower insurance costs.

“One of the biggest losses I’ve seen comes from employee dishonesty where the directors and employees have very few checks and balances on their books,” Ice says. “Folks in these systems need to make sure they have these checks and balances on inventory, purchases, and on their accounting systems. You don’t want the same person taking payments who also is reconciling accounts. This applies both to directors and officers, as well as employees. If one person has direct control, the possibility of a loss is much, much greater.” (For more information about
More information about worker’s compensation is available in the article “Worker’s Compensation 101: What Employers and Employees Need to Know” exclusively on the National Environmental Services Center Web site www.nesc.wvu.edu.

companies try to give them too much coverage. If a system buys more than the $25,000 and $100,000 levels, the system forgoes its rights and can be sued at any amount over that point. A lot of water systems don’t know this, and I’m sure it’s the same in other states.”

Incentives Keep Costs Down

“We give systems a loss experience credit, which means that if they don’t have a claim, they get a percentage of their premiums back,” Ross says. “If they’ve been in the program for two years without a claim they get five percent of their premiums back.” The amount returned increases with the number of years without a claim. “Twelve years in the program without a claim will get you 28 percent of your premium back. We’ve given over half a million dollars back to the systems that paid premiums.”

The program expects to offer discounts in the near future for systems that get adequate training. “We’re working on that now,” she says. “By law, board members will need six hours of training, and they will get a discount on their liability on so many hours of training.” While Ross says no other state rural water associations have comparable programs, she says the ORWA is working to help other associations get one started.

“We’ve been told from insurance brokers that the market is going up, with property insurance rates especially,” she says. “The rates we offer have never gone up in 12 years. They’ve only gone down. We were set up by people who work in drinking water systems, so it’s set up to meet their needs.”

For more information about the Oklahoma Rural Water Association insurance program, visit their Web site at www.okruralwa ter.org or call Lisa Ross at (405) 672-8925.

To learn more about different kinds of insurance and related topics, go to the Insurance Information Institute’s Web site at www.iii.org.

A version of this article originally appeared in the Fall 2000 Water Sense. Published between 1995 and 2000 by the National Environmental Services Center, Water Sense was a newsletter covering financial and management issues in the water industry.

More information about worker’s compensation is available in the article “Worker’s Compensation 101: What Employers and Employees Need to Know” exclusively on the National Environmental Services Center Web site www.nesc.wvu.edu.
If you run a small water system, as with many small business owners, you have the responsibility of managing the finances as well as the operations of the business. And like most small business owners, you probably feel most comfortable about your real business: keeping safe drinking water running throughout your community.

However, you probably feel a little less comfortable about finances. If you are also a board member or the manager, in addition to being the operator, you are held accountable for the financial end of the system. This article is designed to help you gain more control, resulting in less worry and a better night's sleep.

Internal control is an accounting term defined as a plan of organization and all the methods and measures that a business uses to monitor assets, prevent fraud, minimize errors, verify the correctness and reliability of accounting data, promote operational efficiency, and ensure the established managerial policies are followed.

Simply put, internal control is a system of checks and balances designed to ensure that no one person receives the money, deposits the money, and spends the money and that there are different safeguards in the system to properly account for all money and payments.

**Which type is your town?**

Naturally, the smaller the number of people who run the system, the more difficult implementing a system of checks and balances is. However, this does not mean it can't be done; it just means you have to use all the possible resources at your disposal to make it happen.

For now though, my guess is your town falls into one of three types with respect to internal control. The first is “We already have it!” In which case, you still might want to read the article to make sure there are not some things you have overlooked.

The second type is “I do everything, and everyone trusts me to do it, and we have never had any problems.” To this person, I say congratulations for doing a great job and being trustworthy to that degree. But I also would remind you that it is almost impossible to go forever without getting someone angry with you, even for something completely unrelated to your work with the water system. So you might want to try to implement at least some of these controls as a kind of “get out of jail free card” in case you are ever accused of wrongdoing. Unfortunately, I can tell you after 20 years of helping many small business owners, you never know who will turn on you and over what.

The third type is “We have a bookkeeper/office person who takes care of all that stuff and they have it all under control.” To this person I say please, please, please. read this article and take it to heart. You may have the most loyal, trustworthy, and competent person in the world, but you are putting that person and yourself at risk if you do not implement some of the controls discussed here. The number one reason someone becomes a thief is because of opportunity and temptation. I learned this the hard way.

I had a person whose job I saved over and over again because I thought she was doing a great job and I could trust her. That was right up until the day I went into...
the office to do the bank reconciliation because the person finally took a vacation. I found that there was a $7,000 deposit that was carried as a deposit in transit. I started looking at how long it had been in transit. As the months went back, my stomach added another knot, until seven months went by, and I was sick to my stomach realizing I had allowed this money to be taken.

It turned out the person had a gambling habit, and she had taken a deposit and lost it gambling, and then took another deposit to try and get back to even, and so on, and so on. She had figured out some other ways to steal, as well, and that $7,000 was only the tip of the iceberg. The moral of the story is, had I put in place a few of the items mentioned in this article, it would have been more than enough to keep both of us out of trouble.

**Internal Control for Money Received**

Ideally, basic internal control involves using four different people. The duties of each person take varying amounts of time and expertise and are described below. This is not the only way to insert internal controls by any means. However, it will give you a reasonable example that will get you headed in the right direction.

**Person 1**—receives the money, whether via mail, phone call credit payments, or walk-in payments. His or her duties involve sorting the mail into payments received or accounts receivable and invoices to be paid or accounts payable. This person should have a method of recording who the payment was from, what it was for, and the method by which it was paid. This can be done on a spreadsheet, by numbered receipts, or a handwritten list. The point is to have a record to refer to and use as a cross reference. This is the beginning of what accountants call an audit trail.

**Person 2**—gets the money and the recording sheet from person 1, makes sure that all the items on the recording sheet match the money, prepares the deposit slip, and takes it to the bank.

**Person 3**—records the money into the accounting system and verifies that the deposit was made in accordance with what was received.

**Person 4**—does the bank statement reconciliation, matching the bank deposits actually made with the bank deposits that were supposed to have been made.

Please note the separation of duties so that everyone has someone else looking at what they have done to ensure no mistake has been made or any money is missing.

**Internal Control for Money Spent**

Again, this is best as a four-person system. **Person 1**—is the one who needs to purchase items to keep the system up and running, also known as the person who spends the money. Naturally the board will need to develop policies and adopt a budget so this person spends in accordance with some parameters and rules. **Person 2**—writes the checks, after making sure the funds are available to cover them and ensuring that the bills being paid are approved under the established policies. **Person 3**—signs the checks. They must also double-check to ensure that funds are available and the bills are being paid according to policy. **Person 4**—does the bank statement reconciliation ensuring the check signatures are authorized, that the bills paid were authorized properly, and that the funds shown in the accounting system match with the bank statement.

**Implement Internal Control**

I know there are systems out there run by one person who does it all and frequently is an unpaid volunteer to boot. However, most (if not all) systems have a board of directors who should be used to implement these procedures. This is an excellent way to get the board involved in their jobs and to learn more about the system.

Implementing controls is also a way to use some of those folks who don’t want to fix pipes and don’t know anything about fixing things, but could open mail and record information for you. Be creative about who fills the different spots in your checks and balances and try to use this as another tool in having your water system run as effectively and efficiently as possible.

Lastly, having a regular audit by a certified public accountant is a great way to make sure your internal control is working—and another way to ensure yourself a good night’s sleep. ☺

**Bill Luikart** is the operations manager for the California Rural Water Association (CRWA). Before joining CRWA, he was the owner of several small businesses.
Ask some water system managers how long they keep their plant’s various records, and they might tell you they keep them forever. Not necessarily because that’s the rule, but because they want to make sure that nothing is ever left to chance.

Rick Adamson is a good example. He’s the operations superintendent for Adams County Regional Water District (ACRWD) in Ohio, a district with a reputation of excellence in about every area of their organization.

“If something came up down the road that EPA [U.S. Environmental Protection Agency] might question or even if we’ve questioned ourselves,” Adamson says, “we have those physical records. We can go back and check to make sure what we did, at what time, and what we checked for.”

Good recordkeeping is like a kind of insurance. If an operator or manager logs the plant’s daily activities, those records will be there should they ever be needed.

Provisions of the National Primary Drinking Water Regulations require that certain operational records be maintained and reported to EPA. (See sidebar on page 54.) In addition to those obligations, it makes sense for a utility to keep records for their own purposes. The length of time they’re kept beyond what is required is up to the system’s superintendent or manager.

**Old Records Can Be Useful**

Adamson relates a situation where the minutes from old utility board meetings helped their district win a lawsuit to keep a village as one of their customers.

ACRWD sells water to four communities, and one of those communities wanted to pull out of the arrangement and take over another town as a customer.

ACRWD’s water system, which came online approximately 35 years ago, used funding from the U.S. Department of Agriculture’s Farmer’s Home Administration (known as Rural Utilities Service today). FHA had rules about actions communities can and can’t take when they owe money on a loan. Those rules—and the district’s records—were brought out in the ensuing litigation.

“We kept minutes from the board meetings, and we found those records about the agreements. They played a part in that lawsuit,” Adamson says. “As long as we owed money, we had to show payback ability. And, someone can’t come in and take one of your customers. If you get into that kind ofstuff, you need your records to back you up.”

Records play a much larger role in water system management than protection from potentially litigious situations, although their importance from that standpoint is enormous. As mentioned earlier, EPA requires water utility recordkeeping to ensure that drinking water standards are being met. Records act as a guide for employees in performing daily operations. They are necessary for regulatory reporting to state agencies. And system records help plant personnel recognize and diagnose problems that may occur in a plant.

The Montana Water Center discusses record maintenance in their Operator Basics training course. They suggest keeping logs of the following operations, maintenance, and management components:

- system infrastructure (including maps of valve and hydrant locations, pipe sizes and locations);
- equipment purchases, repair, and maintenance;
- monitoring results, including violations received or public notices given,
- leak repair locations and dates;
- water treatment, including any related chlorine residu-
als, fluoride levels, or other monitoring results;
• source production, including static and pumping water levels, flow and water use;
• consumer complaint locations, dates, reason for the complaints and findings;
• monitoring waivers granted by the regulatory agencies.

They also suggest that if you are uncertain about whether records should be kept about something that comes up, try to decide if the circumstances might be of use to someone working at the system in the future.

A daily operating log works well for these situations. These log books are unique to each water system, but have entries in which to document standard operations, such as flow rates, water sampling, chemical dosages, filter backwash time, and weather conditions.

Plenty of Records: Now, how do we store them?

Keeping all these records only makes sense if you can readily find what you’re looking for. Managing files can involve a strategy as simple as cardboard file drawers to computer systems with file management software. It also helps to keep your paper files in a cool room, and not handle them much, especially as they age.

“It’s not really a big deal if you get some kind of system worked out as to how you’re going to keep your files, where you’re going to keep them, and how you’re going to mark them so you can find them without taking three days,” Adamson says.

“As you well know, the computer world has made things a lot easier, but we still do a lot of the hard work. I have many of my records here on a hard drive, then I back them up onto a jump drive. This is a little thing that you can carry on your key ring and plug into your computer. The ones I use are 128 megabytes. I keep everything backed up, because you never know when something is going to go down on you.”

Steve Wilson, manager of the West Anderson Water Company in Anderson, South Carolina, says that their water business keeps everything. “We don’t throw anything away around here. We try to hang onto everything other than the stubs that customers pay with, but we keep our part of it. We also keep records on everything that we have to do with EPA and, of course, our enforcing agency in South Carolina, the DHEC [Department of Health and Environmental Control]. And, we want to make sure we keep OSHA [Occupational Safety and Health Administration] happy. If you don’t keep those boys happy, they can make your life real miserable.”

Wilson has been working on an operations manual for about two years, which he says is up to about four inches thick. He says he even has a couple of copies of the book so that if something happened to him or to his assistant, “then one of my directors could take this book and operate the system.”

Computers also help with Wilson’s daily duties, although his numerous hard paper back-ups show a little mistrust of the technology, along with a sensible approach to disaster planning.

“Computers are great, and you can store a lot of information and have it handy at the touch of a button,” he says. “But, all of this goes back to our emergency preparedness plan. If something wipes out our office, then we’re still able to operate our system manually.”

Wilson refers to his planning as preventive maintenance. He makes sure that he’s got the bones of his reports filled out ahead of time in case something unexpected comes up. “We’ve never had to issue a boil water notice, but emergencies or anything could happen to make you have to do that. I am the spokesperson for our company, so I’ve already got all these forms mostly filled out. I wouldn’t have to waste time sitting in here and wondering what I was supposed to be typing up. If something was to take place, I can get my hands on it quickly. Road names or whatever you need to fill in comes at the last. Then it’s easier on me and or any of my staff.”

Make it Work for You

Your water utility likely already has some kind of recordkeeping procedure, but there may be room for improvement. In case you need some help deciding what records and reports to keep, the Community Resource Group, Rural Community Assistance Program’s
Water Utility Records  And how long they must be kept

The National Primary Drinking Water Regulations require public water systems to retain the following records on the premises or at a convenient location nearby:

- Bacteriological analyses must be kept for at least 5 years.
- Chemical analyses must be kept for at least 10 years. Actual laboratory reports may be kept or just the data, as long as the information includes the following:
  - the date, place, and time of sampling and the name of the person who collected the sample;
  - identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample, or other special purpose sample;
  - date of the analysis;
  - laboratory and person responsible for performing analysis;
  - the analytical technique/method used; and
  - the results of the analysis.
- Records of sampling data and analyses, reports, surveys, letters, evaluation, schedules, state determinations, and other lead and copper control information must be kept for at least 12 years.
- Enhanced filtration and disinfection records (for systems serving fewer than 10,000 people):
  - Turbidity results from individual filter monitoring must be kept for at least three years.
  - Disinfection profiling results (including raw data and analysis) must be kept indefinitely.
  - Disinfection benchmarking (including raw data and analysis) must be kept indefinitely.
- Records of corrective measures for violations of primary drinking water regulations must be kept for at least 3 years after the last corrective action taken.
- Copies of written reports, summaries, or communications relating to sanitary surveys must be kept for at least 10 years.
- Records concerning a variance or exemption granted to a system must be kept for at least five years after its expiration.
- Copies of public notices must be kept for at least 3 years.
- Copies of consumer confidence reports must be kept for at least 3 years.


(Southern RCAP) Community Water Bulletin (February 2004) lists:

- weekly operations log sheets;
- monthly chlorine residual reports;
- maintenance and repair log book;
- lead and copper test results;
- E. coli test results;
- sanitary surveys;
- consumer confidence reports;
- operator certifications and re-certifications;
- monthly reports sent to the public health office;
- copy of your state's sanitary code referring to drinking water; and
- all correspondence with the public health office.

Some other general items to keep include administrative, electronic, fiscal, and utility records (billing, fuel accounting, meter reading, service); certain personnel records; system permits; and system design and construction records (plans, drawings, maps).

The RCAP bulletin also suggests that you include instructions on where to file completed reports and records and how long each should be kept. You can create your own list of records that should be kept, and be sure to have samples of each record or report form. These sample forms will help new hires become familiar with reporting, and they serve as a basis for your recordkeeping system.

Another important note to remember is to make sure employees know not to destroy any records in the midst of an audit or during any kind of litigation against the system. Even the most innocent of intentions may be misconstrued under these circumstances. Make record retention—and destruction, if you're so inclined—a regular part of your system's business. Keeping accurate records consistently over time, and removing unnecessary files when they've outlived their usefulness, demonstrates that your utility has a standardized plan and is less likely to be perceived as retaining good reports and destroying the bad.

"You need to cover yourself," Adamson says. "As a certified operator and certified through the state, I'm responsible for the people that I serve in the county. It's my responsibility to have that paperwork should something transpire and I would need to go back to it."

The Operator Basics course developed by the Montana Water Center is available on CD at no charge. Call the National Environmental Services Center (NESC) at (800) 624-8301 or send an e-mail to info@mail.nesc.wvu.edu and request product #DWCDTR18.

If you've got suggestions for good records management practices, we'd like to hear about them. Call us or drop us a line, and we'll put your suggestions on the NESC Web site.

In addition to Michelle Moore's role as associate editor of On Tap, she is also a NESC promotions editor.
The National Environmental Services Center (NESC)
The publisher of On Tap, NESC has several other services to help small community officials run their water systems more effectively: hundreds of free and low-cost products, a toll-free technical assistance hotline, various databases, and a comprehensive Web site devoted to NESC’s areas of expertise: water, wastewater, solid waste, utility management, and infrastructure security issues.

P.O. Box 6064
West Virginia University
Morgantown, WV 26506-6064
Phone: (800) 624-8301
or (304) 293-4191
Web: www.nesc.wvu.edu

The National Rural Water Association (NRWA)
NRWA has a circuit rider program with hands-on help in every state. Contact information for state associations is available through their national office.
P.O. Box 1428
2915 South 13th Street
Duncan, OK 73543
Phone: (580) 252-0629
Web: www.nrwa.org

The Government Finance Officers Association
Seeks to establish uniformity in state and local government accounting practices
180 North Michigan Avenue, Suite 800
Chicago, IL 60601
Phone: (312) 977-9700
Web: www.gfoa.org

The National Center for Small Communities
This center strives to serve the leaders of America’s small communities.

444 North Capitol Street, NW, Suite 208
Washington, DC 20001-1202
Phone: (202) 624-3550
Web: www.smallcommunities.org/ncsc

The Rural Community Assistance Program (RCAP)
Through its six regional affiliates, RCAP provides assistance to rural communities across the country. Check their national Web site to see which of the affiliates delivers services in your state.

National RCAP Office
1522 K Street, NW, Suite 400
Washington, DC 20005
Phone: (202) 408-1273
Web: www.rcap.org

Great Lakes RCAP
WSOS Community Action Commission
109 South Front Street
P.O. Box 590
Fremont, OH 43420
Phone: (419) 334-5112
Web: www.wsos.org

Midwestern RCAP
Midwest Assistance Program, Inc.
P.O. Box 81
New Prague, MN 56071
Phone: (800) 822-2981
Web: www.map-inc.org

Northeastern RCAP
RCAP Solutions, Inc.
218 Central Street
Wichendon, MA 01475
Phone: (800) 488-1969
Web: www.ricap.org

Southeastern RCAP
Southeast Rural Community Assistance Project, Inc.
145 West Campbell Avenue, Suite 800
P.O. Box 2868
Roanoke, VA 24001-2868
Phone: (540) 345-1184
Web: www.sercap.org

South Central RCAP
Community Resource Group, Inc.
2423 East Robinson Avenue
Springdale, AR 72764
Phone: (501) 756-5583
Web: www.crg.org

Western RCAC
Rural Community Assistance Corporation, Inc.
3120 Freeboard Drive, Suite 201
West Sacramento, CA 95691
Phone: (916) 447-2854
Web: www.rcac.org

Environmental Protection Agency’s Environmental Finance Center Network
There are environmental finance centers in eight of the 10 EPA regions. Each has its own areas of specialization, but all can help with financial management.

Region 1
Environmental Finance Center
University of Southern Maine
96 Falmouth St.
P.O. Box 9300
Portland, ME 04104-9300
Phone: (207) 780-8596
E-mail: barringer@usm.maine.edu
Web: efc.muskie.usm.maine.edu

Region 2
Environmental Finance Center
Syracuse University
219 Maxwell Hall
Syracuse, NY 13244-1090
Phone: (315) 443-9438
E-mail: wjsulliv@maxwell.syr.edu
Web: www.maxwell.syr.edu/efc/

Region 3
Environmental Finance Center
University of Maryland
1012 Skinner Hall
College Park, MD 20742
Phone: (301) 403-220 ext. 18
E-mail: greer@mdsg.umd.edu
Web: www.efc.umd.edu

Organizations Guide
The following offer financial and management help for small systems.
Technical Assistance Network Links Centers
EPA also sponsors a number of technical assistance centers, linked through a network and a Web site called TACNET (water.montana.edu/tacnet).

Region 5
Environmental Finance Center
Cleveland State University
Economic Development Program, UB 215
Maxine Goodman Levin College of Urban Affairs
Cleveland, OH 44115
Phone: (216) 687-2188
e-mail: kobrlc@ix.netcom.com
Web: www.csuohio.edu/glefc/

Region 6
Environmental Finance Center
New Mexico Institute of Mining and Technology
The Institute for Engineering Research and Applications (IERA)
901 University Boulevard, SE
Albuquerque, NM 87106-4339
Phone: (505) 272-7357
e-mail: heatherh@iera.nmt.edu
Web: ef.c.unm.edu

Region 9
Environmental Finance Center IX
Building 7, Alameda Point
851 West Midway Avenue
Alameda, CA 94501
Phone: (510) 749-6867
e-mail: ef.c@greenstart.org
Web: www.greenstart.org/efc

Region 10
Environmental Finance Center
Boise State University
1910 University Drive
Boise, Idaho 83725
Phone: (208) 426-4293
E-mail: bjarock@boisestate.edu
Web: www.boisestate.edu/efc

Missouri
University of Missouri Technology Assistance Center
University of Missouri–Columbia,
College of Engineering
E1511 EBE
Columbia, MO 65211
Phone: (573) 882-7564
E-mail: clevengar@missouri.edu
Web: www.missouri.edu –mowrrc

Montana
Montana Water Center
101 Huffman Building
Bozeman, MT 59717-2690
Phone: (406) 994-6690
E-mail: watercenter@montana.edu
Web: water.Montana.edu/mtac/

New Hampshire
New England Water Treatment Technology Assistance Center
Department of Civil Engineering
Environmental Technology Building–348
University of New Hampshire
35 Colovos Road
Durham, NH 03824
Phone: (603) 862-1407
or (603) 862-1412
E-mail: ne.wttac@unh.edu
Web: www.wttac.unh.com

Pennsylvania
Penn State Harrisburg Small Public Water Systems Technology Assistance Center
175 Science and Technology Lab
777 West Harrisburg Pike
Middletown, PA 17057
Phone: (717) 948-6358
E-mail: szh2@psu.edu
Web: www.hbg.psu.edu/etc

Note: In the future, there will be TACs in California and Maryland.
To order, call the National Environmental Services Center at (800) 624-8301 or (304) 293-4191. You also may send an e-mail to info@mail.nesc.wvu.edu.

### Featured Products

#### The Water Board Bible
This handbook, intended for water boards and council members, provides information and guidance on the regulatory and financial aspects of managing a water utility. It also includes sample board problems and solutions, informational quizzes, and a reading list.

*Item #DWBKMG05*

#### Financial Accounting Guide for Small Water Utilities
Financial accounting is to your utility what an EKG is to your heart specialist. Accounting for money received, expended, and invested shows the health of your facility. This document offers a comprehensive look into small system accounting, explaining how to set up a simple accounting system that gives managers the right information to make financial decisions.

*Item #DWBKFN14*

#### Small System Guide to Rate Setting
Most small systems are reluctant to raise water rates. But changes in regulations and increased costs of doing business make it necessary to review water rates annually. This booklet helps decision makers keep track of a system's finances, make changes in rates structures and analyze customer usage, set minimum rates, gain customer support for rate increases, and more.

*Item #DWBKMG49*

Consolidated rates or single-tariff pricing uses a unified rate structure for multiple water or other systems that are owned and operated by a single utility. This report provides stakeholders with an overview of the issue and the complex trade-offs involved with implementing the practice.

*Item #DWBKMG22*

#### Small System Guide to Financial Management
A community water system is a business, and to be successful, must be run like one. Each chapter of this guide discusses aspects of managing a water system, such as creating a financial plan, budgeting, estimating system revenue and budget balancing, developing a collections policy, and establishing internal controls.

*Item #DWBLFN40*

#### Practical Personnel Management
The second volume in The Water Board Bible series, this handbook discusses the legal aspects of dealing with water system employees and customers, personnel administration, and the future of customer relations.

*Item #DWBKMG15*
All of the products listed are free!
Quantities are limited to one each per order.
If bulk copies are needed, please call for availability.

To order these free products, please use the product order form on page 63 or call the National Environmental Services Center at (800) 624-8301 or (304) 293-4191.

You also may send an e-mail to info@mail.nesc.wvu.edu.

Our newest products are highlighted in blue.

<table>
<thead>
<tr>
<th>DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>DWBDM16</td>
</tr>
<tr>
<td>DWBDM06</td>
</tr>
<tr>
<td>DWBDM05</td>
</tr>
<tr>
<td>DWBDM01</td>
</tr>
<tr>
<td>DWBDM12</td>
</tr>
<tr>
<td>DWBLD02</td>
</tr>
<tr>
<td>DWBDM08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FINANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DWBLF12</td>
</tr>
<tr>
<td>FDBKFN12</td>
</tr>
<tr>
<td>DWBKF08</td>
</tr>
<tr>
<td>DWBKF30</td>
</tr>
<tr>
<td>DWBKF15</td>
</tr>
<tr>
<td>DWSF536</td>
</tr>
<tr>
<td>DWBKF09</td>
</tr>
<tr>
<td>DWBKF33</td>
</tr>
<tr>
<td>FDBKFN4</td>
</tr>
<tr>
<td>DWBKF05</td>
</tr>
<tr>
<td>DWBLF38</td>
</tr>
<tr>
<td>DWBLF07</td>
</tr>
<tr>
<td>DWSF535</td>
</tr>
<tr>
<td>DWSF537</td>
</tr>
<tr>
<td>FDBLNF5</td>
</tr>
<tr>
<td>DWBKF45</td>
</tr>
<tr>
<td>DWBLF40</td>
</tr>
<tr>
<td>FDBLNF4</td>
</tr>
<tr>
<td>DWSF532</td>
</tr>
</tbody>
</table>

ITEM NUMBER BREAKDOWN

First two characters of item number:
(Major Product Category)

DW Drinking Water
FD Finance Drinking Water

Second two characters of item number:
(Document Type)

BK Book, greater than 50 pages
BL Booklet, less than 50 pages
BR Brochure
CD Compact Disk/ROM
FS Fact Sheet
PK Packet
PS Poster
QU Quarterly
SW Software
VT Video Tape

Third two characters of item number:
(Content Type)

DM Design Manual
FN Finance
GN General Information
MG Management
NL Newsletter
OM Operation and Maintenance
PE Public Education
PP Public-Private Partnerships (P3)
RE Research
RG Regulations
TR Training

Last two characters of item number:
(Uniquely identifies a product within a major category)
Use of the Drinking Water State Revolving Fund (DWSRF) to Implement Security Measures at Public Water Systems

Utility Manager's Guide to Water and Wastewater Budgeting

Water and Wastewater Manager's Guide for Staying Financially Healthy

**GENERAL INFORMATION**

**Arsenic in Drinking Water**

**Celebrate Wetlands!**

Clean Ground Water: Virginia's Endangered Inheritance

Community Involvement in Drinking Water Source Assessments

Designing a Water Conservation Program; An Annotated Bibliography of Source Materials

**Drinking Water Academy Training for Federal, State, and Tribal Drinking Water Professionals**

Drinking Water. Know What's In It For You.

Drinking Water. Pour Over the Facts.

Healthy Water, Healthy People

Iron in Drinking Water

Lead Ban: Preventing the Use of Lead in Public Water Systems and Plumbing Used for Drinking Water

**Lead in Drinking Water**

Lead in Drinking Water: An Annotated List of Publications

National Water Quality Inventory: 1998 Report to Congress—Ground Water and Drinking Water Chapters

Nutrient Management to Protect Water Quality

Outreach Resource Guide 2002

Providing Solutions for a Better Tomorrow: A Progress Report on U.S. EPA's Drinking Water Treatment Technology Demonstrations in Ecuador, Mexico and China


Public Water Systems: Providing Our Nation's Drinking Water

The Quality of Our Nation's Waters—A Summary of the National Water Quality Inventory: 1998 Report to Congress

Safe Drinking Water Information in Envirofacts

Summary Report: Small Community Water and Wastewater Treatment

Technical & Economic Capacity of States & Public Water Systems To Implement Drinking Water Regulations

Using Water Wisely in the Home

**Volatile Organic Chemicals in Drinking Water**

Water Facts

Water Quality Self-Help Checklist

**The Water Story**

Wellhead Protection: An ounce of prevention

**MANAGEMENT**


Disinfection Profiling and Benchmarking Guidance Manual

Drinking Water Handbook for Public Officials

 Ensuring Safe Drinking Water for Tribes

Environmental Planning for Small Communities: A Guide for Local Decision Makers

Environmental Pollution Control Alternatives: Drinking Water Treatment for Small Communities

**On Tap Magazine**

OnTap, Volume 1, Issue 1; Spring 2001

OnTap, Volume 1, Issue 2; Summer 2001

OnTap, Volume 1, Issue 3; Fall 2001

OnTap, Volume 1, Issue 4; Winter 2002

NESC Products List - www.nesc.wvu.edu 59
OPERATION AND MAINTENANCE

DWBKOM32 Alternative Disinfectants and Oxidants Guidance Manual
DWBKOM17 Arsenic Removal from Drinking Water by Coagulation/Filtration and Lime Softening Plants
DWBKOM12 Arsenic Removal from Drinking Water by Ion Exchange and Activated Alumina Plants
DWBKOM33 Arsenic Removal from Drinking Water by Iron Removal Plants
DWBKOM30 Control of Biofilm Growth in Drinking Water Distribution Systems
DWBKOM16 Controlling Disinfection By-Products and Microbial Contaminants in Drinking Water
DWKBRE11 Control of Lead and Copper in Drinking Water
DWFSON30 Drinking Water Security and Emergency Preparedness: Top Ten List
DWBREL01 Impact of Pipe Coatings on Drinking Water Quality
DWFSON10 Interim Enhanced Surface Water Treatment Rule: A Quick Reference Guide
DWBROM28 Iron Bacteria Problems in Wells
DWSWOM34 Leak Audit Software for Water Utilities to Quantify Distribution System Water Losses
DWBLM22 An Operator’s Handbook for Safe Drinking Water For Other Than Municipal and Nontransient Noncommunity Water Systems
DWKOM09 Optimizing Water Treatment Plant Performance Using the Composite Correction Program: 1998 Edition
DWBLOM13 Oxidation of Aeration and Storage
DWPKOM24 Preventive Maintenance Tasks for Tribal Drinking Water Systems
DWFSON19 Safety Tips: Hazard Communications
DWCSTR19 Sanitary Survey Fundamentals Prep Course
DWBLOM29 Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems
DWBLM05 Shock Chlorination of Wells and Springs
DWFSON11 Stage 1 Disinfectants and Disinfection Byproducts Rule: A Quick Reference Guide
DWPKOM36 Tech Brief Package
DWFSON52 Tech Brief: Corrosion Control
DWFSON39 Tech Brief: Diatomaceous Earth Filtration for Drinking Water
DWFSON50 Tech Brief: Disinfection
DWFSON51 Tech Brief: Filtration
DWFSON46 Tech Brief: Ion Exchange and Demineralization
DWFSON42 Tech Brief: Iron and Manganese Removal
DWFSON38 Tech Brief: Leak Detection and Water Loss Control
DWFSON41 Tech Brief: Lime Softening
DWFSON43 Tech Brief: Membrane Filtration
DWFSON47 Tech Brief: Organic Removal
DWFSON44 Tech Brief: Ozone
DWFSON48 Tech Brief: Package Plants
DWFSON31 Tech Brief: Point-of-Use/Point-of-Entry Systems (POU/POE)
DWFSON56 Tech Brief: Pumps
DWFSON45 Tech Brief: Radionuclides
DWFSON15 Tech Brief: Reservoirs, Towers, and Tanks–Drinking Water Storage Facilities
DWFSON40 Tech Brief: Slow Sand Filtration
DWFSON20 Tech Brief: System Control and Data Acquisition (SCADA)
DWFSON37 Tech Brief: Treatment Technologies for Small Drinking Water Systems

PUBLIC EDUCATION

DWSPE020 21 Water Conservation Measures for Everybody
DWBPE150 America’s Priceless Ground Water Resource
DWBPE124 Answers to your Questions about Groundwater
DWBPE130 Answers to Your Questions on Well Maintenance
DWBPE127 Bacteria and Water Wells
DWFSP140 Bacteriological Contamination of Drinking Water
DWBLPE129 Better Homes & Groundwater
DWBLPE150 Big Rivers
DWBPE04 Bottled Water: Helpful Facts and Information
DWBPE104 Children and Drinking Water Standards
DWBPE32 Citizen Monitoring: Recommendations to Household Well Users
DWBPE37 Citizen’s Guide to Ground Water Protection
DWBPE103 Class V Injection Wells and Your Drinking Water
DWBPE125 Cleaner Water Through Conservation
DWBPE145 Cryptosporidium and Drinking Water
DWBPE171 Cryptosporidium and Drinking Water (Spanish)
DWBPE138 Desdemona’s Splash
DWBPE28 De sus Ninos del Plomo en el Agua Potable (Protecting Your Kids from Lead in Drinking Water)
DWBPE152 Discover Ground Water & Springs
DWSPE154 Distillation For Home Water Treatment
DWBPE147 Domestic Water Treatment for Homeowners
DWBPE39 Drinking Water Activities for Teachers and Students
DWBPE123 Drinking Water and Health: What you need to know!
DWBPE184 Drinking Water and MTBE: A Guide for Private Well Owners
DWBPE114 Drinking Water Chlorination: A Review of Disinfection Practices and Issues
DWBPE05 Drinking Water from Household Wells
DWSPE131 Drinking Water Monitoring, Compliance, and Enforcement
DWSPE122 Drinking Water: Past, Present, and Future
DWSPE118 Drinking Water Quality in Indian Country: Protecting Your Sources
DWSPE120 DWSPE120 Drinking Water Quality Reports—Your Right to Know
DWSPE57 Emergency Disinfection of Water Supplies
DWBPE96 Fact Sheet on Home Drinking Water Treatment
DWBPE74 Fact Sheet: Water Conservation Measures
DWBPE179 The Further Adventures of Captain Hydro Brings You “Water Magic!” (Teacher Activity Guide)
DWBPE178 The Further Adventures of Captain Hydro: Hero of Water Conservation
DWBLRG88 Lead and Copper Rule Minor Revisions: Fact Sheet for Tribal Water System Owners and Operators
DWBKRG21 Lead In Drinking Water Regulation: Public Education Guidance
DWBKRG61 Microbial and Disinfection Byproduct Rules: Simultaneous Compliance Guidance Manual
DWBLRG12 Monitoring Guidance Document for the Lead & Copper Rule (Systems serving 3,301–10,000 people)
DWBLRG13 Monitoring Guidance Document for the Lead & Copper Rule (Systems serving 501–3,300 people)
DWBLRG14 Monitoring Guidance Document for the Lead & Copper Rule (Systems serving 101–500 people)
DWBLRG15 Monitoring Guidance Document for the Lead & Copper Rule (Systems serving less than 100 people)
DWFSGRG77 National Primary Drinking Water Standards
DWTTRG34 Nontransient Noncommunity Drinking Water: Requirements for Suppliers
DWFSGRG60 Proposed Ground Water Rule: Questions and Answers
DWFSGRG83 Public Notification Rule: A Quick Reference Guide
DWBLRG84 Radionuclides Notice of Data Availability Technical Support Document
DWFSGRG66 Radionuclides Rule: A Quick Reference Guide
DWBLRG58 Regulations on the Disposal of Arsenic Residuals from Drinking Water Treatment Plants

**TO PLACE AN ORDER**

To place an order, call the NDWC at (800) 624-8301 or (304) 293-4191, or use the product order form on the facing page and fax your request to (304) 293-3161.

You also may send an e-mail to info@mail.nesc.wvu.edu.

Be prepared to give the item number and title of the product you wish to order.

Please indicate the product item number, title, and quantity for each item ordered. Make sure you include your name, affiliation, address, and phone number with each order.

Quantities are limited to one each per order.

If bulk copies are needed, please call for availability.

**TECHNOLOGIES**

DWBKDM15 Corrosion Manual for Internal Corrosion of Water Distribution Systems
DWBLDM03 Cross-Connection Control Manual
DWBKDM07 Nitrate Removal for Small Public Water Systems
DWBLRG48 Small System Compliance Technology List for the Surface Water Treatment Rule
DWBKDM04 Technologies for Upgrading Existing or Designing New Drinking Water Treatment Facilities
DWBLGN11 USEPA Fact Sheets on POU/POE Units and Home Water Testing

**RESEARCH**

DWBLRE06 Benefits of Water and Wastewater Infrastructure
DWBKRE29 Drinking Water and Ground Water Data Within the 305(b) Program
DWBKRE26 Drinking Water Progress Review Workshop for the 1995-1998 Science to Achieve Results (STAR) Grants
DWBLRE20 Drinking Water Treatment for Small Communities: A Focus on EPAs Research
DWBLRE24 Estimating the Likelihood of MTBE Occurrence in Drinking Water Supplied by Ground-Water Sources in the Northeast and Mid-Atlantic Regions of the United States
DWBKRE27 A Field Study to Compare Performance of Stainless Steel Research Monitoring Wells with Existing On-Farm Drinking Water Wells in Measuring Pesticide and Nitrate Concentrations
DWBLMG17 Initial Summary of Current State Capacity Development Activities
DWBKRE21 Laboratory Study on the Oxidation of Arsenic III to Arsenic V
DWBKRE25 Methods for the Determination of Organic and Inorganic Compounds in Drinking Water: Volume 1
DWBLRE18 National Pesticide Survey: Update and Summary of Phase II Results

DWBLRE19 Occurrence and Distribution of Methyl tert-Butyl Ether and Other Volatile Organic Compounds in Drinking Water in the Northeast and Mid-Atlantic Region of the United States, 1993-98
DWBLRE07 Radium Removal from Water by Manganese Dioxide Adsorption and Diatomaceous Earth Filtration
DWBKGN64 Safe Drinking Water Act, Section 1429 Ground Water Report to Congress
DWBLRE08 Strengthening the Safety of Our Drinking Water: Report on Progress & Challenges & Agenda for Action
DWBKRE15 Ultraviolet Light Disinfection Technology in Drinking Water Application — An Overview

**ORDERING PRODUCTS**

Please indicate the product item number, title, and quantity for each item ordered. Make sure you include your name, affiliation, address, and phone number with each order.
To Order NESC Products:

Call:  
(800) 624-8301 or (304) 293-4191  
Business hours are 8 a.m. to 5 p.m.  
Eastern Time

Fax:  
(304) 293-3161

Mail:  
National Environmental Services Center  
West Virginia University  
P.O. Box 6064  
Morgantown, WV 26506-6064

E-mail:  
info@mail.nesc.wvu.edu

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Ordered</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Number of Products Ordered

Please allow two to four weeks for delivery.

Mailing Information  (Please Print)

First Name  Last Name

Organization/Company Name

Address  City  State  Zip Code

Telephone Number  Fax Number  E-mail Address

Fun Time Puzzle Solutions

Hmmm...

The Atlantic Ocean is saltier than the Pacific Ocean. Neither compares to Utah’s Great Salt Lake, which is more than four times as salty as any ocean.

Source: www.corsinet.com
ACROSS

1. Wear away
2. Pitcher
3. Uncommon
4. Singer Redding
5. Dewey _______ System
6. Design
7. Pencil end
8. Juan's goodbye
9. Snuggle
10. Month preceding November
11. Marinara accompaniment
12. Once more
13. Harps
14. Translucent gem
15. Assistant
16. Canny
17. Author Jong
18. Podium
19. Russian ruler prior to 1917
20. Stand firm
21. Foot part
22. Officer training program
23. Deep sleep
24. Even score
25. Fermented honey beverage
26. Prima ______
27. Mottos
28. Wrigley’s product
29. Common medicine dose
30. Thought
31. Rapid rise
32. Flightless bird
33. Graven image
34. Hang-up
35. Completely
36. Faux pas
37. Recess
38. Cosmetics company
39. Bluish-white metallic element
40. War ___ Peace
41. Fifth sign of the zodiac
42. Relative by marriage (hyphenated)
43. Relinquish
44. By way of
45. Tibetan priests
46. Comfort
47. Beget
48. Car maker ____ Romeo
49. Pros and ___
50. Beak
51. Financial plan
52. One component of capacity development
53. Agile
54. What you do on a table (two words)
55. Honor
56. Regenerate
57. Chop very small
58. Necessity for life on Earth
59. Veneration
60. Change text
61. Weight allowance
62. Overacts
63. Bluish green
64. Poet St. Vincent Millay
65. Movie theater unit
66. Sits in the sun
67. Flying insect
68. Malevolent
69. Cask
70. Piece of embroidery
71. Vine
72. Pantyhose shade
73. Vine
74. On Tap publisher
75. One between the age of 12 and 20 (hyphenated)
76. Plaudit

DOWN

1. Pitcher
2. Pitcher
3. Singer Redding
4. Dewey _______ System
5. Pencil end
6. Notebook
7. Prevaricator
8. Juan's goodbye
9. Snuggle
10. Month preceding November
11. Marinara accompaniment
12. Once more
13. Harps
14. Translucent gem
15. Assistant
16. Canny
17. Author Jong
18. Podium
19. Russian ruler prior to 1917
20. Stand firm
21. Foot part
22. Officer training program
23. Deep sleep
24. Even score
25. Fermented honey beverage
26. Prima ______
27. Mottos
28. Wrigley’s product
29. Common medicine dose
30. Thought
31. Rapid rise
32. Flightless bird
33. Graven image
34. Hang-up
35. Completely
36. Faux pas
37. Recess
38. Cosmetics company
39. Bluish-white metallic element
40. Comfort
43. Relinquish
46. War ___ Peace
47. Beget
49. Relating to heat or food
51. Financial plan
53. Agile
54. What you do on a table (two words)
55. Honor
56. Regenerate
57. Chop very small
58. Necessity for life on Earth
59. Veneration
60. Change text
61. Weight allowance
62. Overacts
63. Bluish green
64. Poet St. Vincent Millay
65. Movie theater unit
66. Sits in the sun
67. Flying insect
68. Malevolent
69. Cask
70. Piece of embroidery
71. Vine
72. Pantyhose shade
73. Vine
74. On Tap publisher
75. One between the age of 12 and 20 (hyphenated)
76. Plaudit
WATER TRIVIA

Q: Which U.S. city was the first to put fluoride in its drinking water?

a) New York, NY  
b) Philadelphia, PA  
c) Boston, MA  
d) Grand Rapids, MI  
e) San Francisco, CA

Answer: According to “Geography Trivia” on the Trivia by Brain Candy Web site, Grand Rapids, Michigan, was the first U.S. city to fluoridate water.

Source: www.corsinet.com

WATER FACT

The average person in the U.S. uses 80 to 100 gallons of water each day. During Medieval times (c.500–1500 A.D.), a person used only five gallons per day.

Source: www.njawwa.org

QUOTES

“Technological progress has merely provided us with more efficient means for going backwards.”

Aldous Huxley (1894–1963)

“There’s no business like show business, but there are several businesses like accounting.”

David Letterman (1947–)

“Drive thy business or it will drive thee.”

Benjamin Franklin (1706–90)

“Water is the only drink for a wise man.”

Henry David Thoreau (1817–62)

“The biggest shortage of all is the shortage of common sense.”

Author Unknown
Is it possible to imagine any business-type enterprise that shouldn’t be run like a business? Even faith-based institutions are run like businesses these days. And though scholars debate whether government should be modeled on the private sector, public administrators know that government-owned utilities are required to be operated as enterprises and that customers benefit when water utilities are operated in this manner.

It isn’t enough to build a system, repay creditors, and operate it effectively. Sustainable public water systems also must reinvest in the capital assets needed to produce what is sold: safe drinking water. To drive home this concept, let’s use a business example to illustrate the idea of reinvestment in productive assets.

I’m going to create a business—Awesome Widget Enterprises, Inc. (AWE)—that manufactures widgets. To start up the business, I’ll borrow money from the local bank to buy a widget manufacturing machine. The machine is supposed to last for 15 years, and I’ll pay back the loan in five years. With all of the other necessary operations in place, I’ll begin producing widgets and making sales. The plan is to make 100 widgets a day, the sales of which will meet all my business costs including the loan repayment.

Fast forward to the future. Everything went great for the first 10 years. We paid back the loan after five years and AWE widgets are a well-established product in the marketplace. In year 11, though, we notice that our total production is still 100 widgets per day, but nine are defective and can’t be sold. To overcome this loss of salable widgets, we raise the price of the ones we can sell. In year 12, we are experiencing 20 defectives per 100, but we can’t raise the price and still be competitive in the marketplace. Now what?

Management decides that it’s time for AWE to renew its production capability. Because AWE has been expensing depreciation of its widget machine through part of its sales revenue, there are some funds available to offset the costs of replacing the machine.

In effect, part of the sale of each widget helped to pay for the wear and tear on the machine. Another part of each sale paid for the retirement of the debt (at least for the first five years) that we incurred to buy our first machine. AWE could wait until the current machine was completely broken, but management realizes that they need to produce a certain number of widgets at a competitive price to bring in enough money to keep the business going. And they’re not going to wait for the government or anyone else to bail them out.

Should government-operated enterprises, such as water systems, operate under different business rules? Is it appropriate for environmental operations to ignore the cost of system replacement and pay only for their operating and debt costs? If so, can we expect these systems to provide sustainable public goods and services effectively and efficiently over time?

The answers to these questions are no, no, and probably not. It isn’t appropriate to expect that government enterprises or “businesses” should have financial management characteristics that are different from well-managed private businesses. (I emphasize well-managed here because the road to success in the private sector is strewn with the wreckage of businesses that have been mismanaged.)

The difference however, is that public environmental systems can last for a very long time before their capabilities to provide service are eroded to the breaking point. And that timetable, the term of office of policymakers, and the memory of the customers aren’t always in sync.

A longer version of this article is available on the NESC Web site (www.nesc.wvu.edu).
All you have to do is ask.

Clean, safe drinking water: *priceless*

Functioning wastewater treatment: *priceless*

NESC services: *free*

We’re waiting to put NESC’s assistance, solutions, and knowledge to work for you.

Contact us for more information.

(800) 624-8301  |  info@mail.nesc.wvu.edu  |  www.nesc.wvu.edu

_ Assistance.Solutions.Knowledge _

The National Environmental Services Center
P.O. Box 6064
Morgantown, WV  26506-6064

**National Environmental Services Center**
West Virginia University Research Corporation
West Virginia University
P.O. Box 6064
Morgantown, WV 26506-6064

**CHANGE SERVICE REQUESTED**