



Copyright © 2011

The entire contents of this guide are available on the RCAP website at [www.rcap.org](http://www.rcap.org)

This material is based upon work supported under a grant by the Utilities Programs, United States Department of Agriculture. Any opinions, findings, and conclusions or recommendations expressed in this material are solely the responsibility of the authors and do not necessarily represent the official views of the Utilities Programs.

# The Big Guide for Small Systems: A Resource for Board Members



Rural Community Assistance Partnership, Inc.

1701 K St. NW, Suite 700  
Washington, DC 20006  
202/408-1273  
800/321-7227 (toll-free)  
info@rcap.org

[www.rcap.org](http://www.rcap.org)

# Table of Contents

<b>INTRODUCTION</b>			1
<b>Water and Wastewater Treatment Basics</b>			3
<i>What happens in our facilities?</i>			
Drinking Water Treatment			3
Wastewater Treatment			4
What is Needed to Operate a Water or Wastewater Treatment Plant?			6
<b>Regulatory Responsibilities</b>			9
<i>What are the laws and regulations we must comply with?</i>			
Safe Drinking Water Act (drinking water)	9	State or Tribal Regulations	16
Clean Water Act (wastewater)	14		
<b>Board Business</b>			17
<i>How do we conduct our affairs?</i>			
Legal Authority	17	Project Management	26
Roles of Board Members	17	Planning and Preparing for Emergencies	28
Mission Statement	19	Recordkeeping	30
Rules for Conducting Board Meetings	19	Communications	31
Conflict Resolution	22	Limiting Board Liability	33
Management Duties	23	Bonus section: Good	35
Policies	25	Board Members: Dos & Don'ts	
<b>Financial Duties and Responsibilities</b>			36
<i>How do we keep the financial engine of our system running well?</i>			
Budgeting	36	Facility Master Plan	50
Financial statements	37	Annual Audit	52
The balance sheet	39	How to Succeed at Obtaining Funding	53
The income statement	44	Income Adjustments	54
The cash-flow statement	47	Recordkeeping	56
<b>GLOSSARY</b>			62
<b>APPENDICES</b>			76
A	Example Standard Operating Procedures (SOPs)		
B	Regulatory Process		
C	Maximum Contaminant Levels (MCL) and Secondary Standards For Drinking Water		
C1	Regulated Microorganisms in Drinking Water		
C2	Regulated Disinfection Byproducts in Drinking Water		
C3	Regulated Disinfection Chemicals in Drinking Water		
C4	Regulated Radionuclides in Drinking Water		
C5	Regulated Inorganic Chemicals in Drinking Water		
C6	Regulated Organic Chemicals in Drinking Water		
D	NPDES Permit Testing Requirements for Publicly-Owned Treatment Works		
D1	Effluent Parameters for All POTWs		
D2	Effluent Parameters for All POTWs with a Flow > 0.1 MGD		
D3	Effluent Parameters for Selected POTWs: Total Recoverable Metals, Cyanide, and Total Phenols		

# Table of Contents (continued)

D4	Effluent Parameters for Selected POTWs: Volatile Organic Compounds
D5	Effluent Parameters for Selected POTWs: Acid-Extractable Compounds
D6	Effluent Parameters for Selected POTWs: Base-Neutral Compounds
E	Parliamentary Procedures at a Glance
F	Hiring and Terminating Employees and Sample Job Descriptions
F1	Hiring Employees
F2	Terminating Employees
	Sample Job Descriptions
F3	General Manager
F4	Certified Water Operator
F5	Maintenance Service Technician
F6	Office Manager
F7	Bookkeeper/Operations Clerk
G	Sample Policy Statements
G1	Customer-Service Policy
G2	Customer-Service Policy
G3	Code of Ethics Policy
G4	Cross-Connection Control Policy
H	Emergency-Response Planning
I	Sample Community Confidence Report (CCR)
J	Planning

---

## Introduction

This publication is intended for both new and experienced members of the board of directors of a drinking water or wastewater utility or members of the highest governing board of a system. For new board members, it is an ideal orientation to all of the aspects of your new role. For those with some experience, it can serve as a useful reference guide for your continuing role. Used on a group basis with whole boards, it can help set some standards in your work together, enabling everybody to get on the same page and moving in the same direction.

Regardless of your experience level, as a board member, you have chosen to be responsible for and have been elected to maintain and improve your community's health by protecting its water. It's a big job, and understanding and using this guide can be helpful in performing your duties.



## Sections in this guide

**Water and Wastewater Treatment Basics:** Learn about the treatment steps for water and wastewater; the necessity of written standard operations and emergency-operations procedures; the importance of timely maintenance, certification and safety training, and records retention; and best management practices to keep your facility running smoothly.

**Regulatory Responsibilities:** This section discusses federal regulations for water and wastewater systems, including fulfilling requirements of the Safe Drinking Water Act, the Clean Water Act, the Source Water Protection Program and others. State requirements for testing, monitoring and inspecting may require more than the federal regulations do, so you should consult your state for specific guidance.

**Board Business:** This section talks about behaving like a board and will help you with many aspects of management, including how to run a meeting, establish policies, manage projects and plan for emergencies. Nothing teaches management skills like experience, but these guidelines will assist you in developing standard applications.

**Financial Duties and Responsibilities:** This section is all about money—planning, budgeting, reviewing rates, financial statements and investments. It will help you learn who has money in the forms of grants or loans, how you can get a piece of it, and where you can go for assistance.

**Glossary:** You will notice that some terms appearing in the sections above are printed in bold. The definitions for these terms as used in this guide are found in the glossary at the end of this publication.

**Appendices:** The appendices provide additional and more in-depth information on many topics that are addressed in the main part of the guide. There are many examples of job descriptions, policies and other tools for managing a water system. For these sort of items, when it would be useful to have the text of the examples in electronic form so you can edit it, add to it and adapt it to your system's particular situation, Microsoft Word documents of individual policies, job descriptions, etc., can be downloaded on the RCAP website at [www.rcap.org/boardguide](http://www.rcap.org/boardguide).

*The information contained in this guide is for informational purposes only and is not legal advice or a substitute for legal counsel. As legal advice must be tailored to the specific circumstances of each case, nothing provided in this guide should be used as a substitute for advice of competent counsel. RCAP, Inc., expressly disclaims all liability in respect to actions taken or not taken based on any or all of the contents of this manual.*

# Water and Wastewater Treatment Basics

If you are a new board member of your water system, one of the first things you should do to get oriented with the responsibilities of your role is to complete a walking tour of the water and/or wastewater system for which you are now responsible. Exploring the facilities of your system with the operator will give you an understanding of the immense importance of your new position to community health and safety. Don't hesitate to ask questions until you understand how your system works.

In your role on the governing body of your water or wastewater system, you are expected to help oversee the system and make major decisions about it, some of which will involve large amounts of money. This means you, along with the other leaders, need to know about all of the activities that go on in the system—not with an extensive knowledge of each, but at least with an awareness of what happens and what is required in each.

Treatment of drinking water and wastewater is a complex process that involves knowledge of math, biology, chemistry, physics, as well as state and federal rules and regulations. The central and biggest function of your system is treatment of water and wastewater, so it is to your advantage to understand the basics of these operations. With this bit of knowledge, you can make better and more informed decisions about the operations of these activities in your system because you will know something about what is involved, what is required and why it needs the investment of so much capital. You will also understand what one of your key employees—the operator—must do to keep the system running and why it is a constant job of monitoring and maintenance.

## Drinking Water Treatment

Most small water systems use **groundwater** for their water supply, but some use **surface water**. If your system uses groundwater, the first stop on your tour should be the **well** house or well field. You might see pump stations, or your system might employ submersible pumps to move the water from the source to treatment. You will probably notice the generators or power supply that powers the pumps. Ask your system's operator to point out valves, flow meters, sampling points and other equipment that's used to operate and maintain the wells. Discuss the **wellhead protection plan** or the findings of the **sanitary survey** to better understand how your water supply is protected.

If your system uses surface water, walk around the reservoir near the point at which water is drawn into the treatment system or the point at which water is withdrawn from a river or stream. Many surface water systems use gravity to deliver water from the reservoir to treatment. Ask your operator to point out control valves and overflow gates. Notice roads and fences near the reservoir, and ask your operator about preventing unauthorized access. Talk about how activities (farming, factories, etc.) in the reservoir's **watershed** affect drinking water treatment. Find out if your system requires control for algae,



zebra mussels, snails or other inhabitants of the surface water.

Next, move into your water treatment facility. Drinking water treatment is fairly straightforward. Your system may have a flow-equalization basin, so that changes in flow rates are mitigated. You will probably see an area of the facility dedicated to water-contaminant removal (**turbidity**, metals, arsenic, **pH** adjustment, radionuclides or others specific to your area). You might notice chemical feed systems, coagulation basins or tanks (where the chemicals cause the contaminants to **floc**—clump together—and fall to the bottom of the basin), and **filtration** systems (which remove the floc that doesn't fall). Some small water systems use other forms of contaminant removal, like **ion exchange**, **activated alumina**, **membranes** or **softening**. There may be more than one type of contaminant-removal process used. Ask your operator to explain which contaminants are of particular concern to your system and how the system removes or controls them. Have the operator point out sampling ports and discuss issues that can affect the efficiency of contaminant removal (like high precipitation events, scheduled maintenance activities, or emergencies).

**Disinfection** is the next step in drinking water treatment. Disinfection inactivates biological contaminants in the water (bacteria, protozoa, algae and viruses). Your system may use chemical disinfection, like chlorine, or it may use ultraviolet light or ozone. You may see disinfection contact basins, chemical feed systems, sampling ports, clearwells and pumps. Ask your operator to explain the disinfection process in your system and to discuss issues that pertain to your specific system, like the **disinfection byproducts** that may occur and how operation and maintenance affects them.

Walk a portion of your **distribution system** with your operator. Your system may use a water

tower to provide storage and pressure or may have underground storage tanks for finished water. You may see sampling stations, booster disinfection injection points, shutoff valves and fire hydrants. Find out how often **preventative-maintenance** practices are being performed, such as line cleaning, scheduled replacement of old pipes and fire hydrant valve exercising. Ask if there are areas that pose particular challenges in water distribution, such as dead-end lines, areas that flood frequently, areas that seem to generate excessive customer complaints regarding taste and/or odor, or areas suspected of leakage, and how operations and maintenance address the problems.

## Wastewater Treatment

Wastewater treatment is more complicated than water treatment. Your system may be a **centralized system**, in which wastewater is collected from the community and treated together in one place, or a **decentralized system** (sometimes known as a **septic system**), in which wastewater is collected and treated onsite, near a house or building.

Walk (or drive) a portion of the **collection system** (also called sanitary sewers) with your operator. You may see sampling stations, pump stations, pressure-relief valves, vacuum breakers, manholes and shutoff valves. Ask your operator how well the collection system is documented (maps using GPS notations, electronic records, other) and what preventative-maintenance practices are being followed (cleaning, valve exercising, scheduled pipe replacement). Find out if there are areas that pose particular challenges, like excessive odor complaints from customers, areas suspected of leakage, or areas prone to flooding, and ask how the problems are addressed. Find out if the collection system is a combined-sewer type (carrying both storm water runoff and wastewater),



and identify any special issues that arise from that configuration.

There are three main phases of wastewater treatment in a centralized system:

1. removal of large and floatable material
2. treatment of wastewater
3. treatment of sludge

The collection system often contains cans, plastic, paper, rags, sanitary napkins and other large items, which are removed in the **headworks** of the wastewater treatment system and disposed of in a landfill. Ask your operator how this waste is removed. Some systems clean their **screens** and place the screenings in a dump truck, while others use **comminutors**, **macerators** or **grinders** to reduce the volume of these solid wastes. After passing through the headworks, the wastewater is directed to **primary treatment**.

Primary treatment generally involves the removal of some **suspended solids** and **organic** matter from wastewater. Your system may contain a grit-removal system to protect equipment from abrasion and wear. As the flow of wastewater is equalized, the grit drops out of the waste stream and is removed. You may see large primary sedimentation basins (circular or rectangular) containing skimmer mechanisms on top and **sludge-removal** systems in the bottom. Or you may see **aeration** basins used to remove suspended matter and concentrate biosolids. You may notice chemical feed systems that enhance the operation of these processes. Ask your operator to identify the primary-treatment components of your particular system. The wastewater flows from primary treatment into

## TECHNICAL PROCESSES EXPLAINED IN EVERYDAY LANGUAGE

There is no substitute for an in-person visit to your community's drinking water or wastewater treatment plant. On a walk-through with your system's operator, you can see, touch and learn about your community's particular facilities and what the operator does to keep them running.

To support what you learn and to keep as a reference after your visit, RCAP has produced two publications for members of utility governing bodies like you:

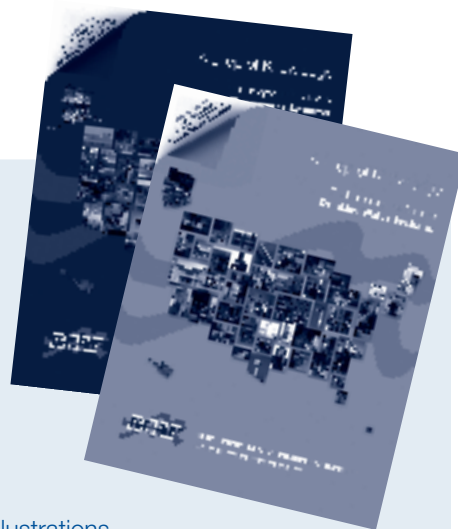
- *A Drop of Knowledge: The Non-operator's Guide to Drinking Water Systems*
- *A Drop of Knowledge: The Non-operator's Guide to Wastewater Systems*

The operator of your system has a technical mindset, but these guides are written especially for people who aren't technically oriented or who have had little or no exposure

to water treatment. These guides provide basic explanations of the treatment processes in plain, everyday language for non-technical audiences. Included are many diagrams, illustrations and photos that explain the treatment steps.

The guides are available in print from RCAP staff in the field or as PDF, which you can view and print yourself on your own computer at [www.rcap.org/commpubs](http://www.rcap.org/commpubs).

There are also multimedia supplements to the publications that can be accessed through the URL above. An animated diagram shows the drinking water and wastewater treatment processes, and video segments explain some of the steps and things that an operator considers in each part.



**secondary treatment**, while the sludge goes its separate way.

The purpose of secondary treatment is to remove biodegradable organic matter, nutrients like nitrogen and phosphorus and suspended solids from the wastewater. There are many different processes that can be used to accomplish this goal: **aerobic** or **anaerobic** digesters, oxidation, membrane filtration, chemical treatment and more. Each of these processes has its own design basis in the constituents present in your system and has its own operational and maintenance issues. Your system may use more than one of these technologies. Talk to the operator to find out how the process works in your particular situation. Find out what affects the operation of your secondary treatment and how the operator compensates for the problem.

Disinfection is considered part of secondary treatment of wastewater. If your system instead uses a form of tertiary treatment, like granular filtration or microscreens, to remove residual suspended solids, then disinfection becomes part of tertiary treatment. As in drinking water treatment, disinfection can be accomplished through chemical, ultraviolet light or ozone processes. Disinfection inactivates biological contaminants in the wastewater (**bacteria**, some **protozoa**, **algae** and **viruses**) prior to discharge of the water back into the environment, usually into a receiving stream. Sometimes a portion of wastewater is reused—generally as **nonpotable** water piped back into the community for irrigating golf courses and public parks, groundwater recharge, or as process water in industrial settings.

The sludge that is removed from primary and secondary treatment processes must also be treated prior to being disposed. Sludge is a combination of solids and **biosolids**. Treatment consists of reducing and inactivating pathogens

(like fecal coliform or *Salmonella*), eliminating offensive odors and removing hazardous or toxic materials. Thickeners may be used to increase the solids content of sludge. Aerobic or anaerobic digesters may be used to reduce volatile solids and to stabilize biosolids. There may be a process to chemically “condition” the biosolids (to improve dewatering), and then the sludge is dewatered prior to disposal. Biosolids may be sent to a landfill or applied to land as fertilizer if they fulfill certain requirements. Ask your operator what makes up the final disposition of your system’s sludge.

## What is Needed to Operate a Water or Wastewater Treatment Plant?

There are certain parts of the operation that are common to both drinking water treatment systems and wastewater treatment systems. Your system should follow best management practices to protect public health and avoid disruption of service. Components of best management practices for water and wastewater treatment systems include :

- a written operations and maintenance (O&M) manual
- a benchmarking program
- a plan for recruiting, certifying and training operators

The **O&M manual** should be written in a way that someone unfamiliar with the system could pick it up, read the appropriate section and know how to run that portion of the system. It should contain a page to identify the system—the system’s name, owner’s name(s), address(es), physical location, phone number(s), design-flow capacity,

# TIP



Know where the O&M manual is kept, and ensure it's kept up-to-date.

type of treatment and water source. It should detail the decision-making chain of command. It should note which activities require qualified and licensed/certified personnel and what licenses and certifications are required for the system. This section should also include the responsibilities of all staff, including the operator, manager and owner/board.

The O&M manual should have a section on system operations. For water systems, this includes the source water and the type of treatment described, principal design criteria, a flow diagram, an analysis of **hydraulic capacity**, pumping stations, storage tanks and the distribution system. For wastewater systems, operations should include the collection system, treatment described, principal design criteria, a **flow diagram**, a **hydraulic analysis**, pumping stations, and where water is returned to the environment. It should also include information on sludge removal, processing and disposal. The O&M manual should include written **standard operating procedures** (SOPs), and written **emergency operating procedures** (EOPs) or **emergency-response plans** (ERPs) for a variety of scenarios. A **vulnerability assessment** (VA) may be included. The EOPs should include personnel assignments, an emergency equipment inventory and emergency phone numbers.

More on some of these items may be found in the appendices:

- SOPs (an example of a set of these): Appendix A
- VAs and ERPs: Appendix H

Your O&M manual should also include information on asset management, preventative maintenance tasks, scheduling and common operating problems.

Laboratory testing procedures should be described in the O&M manual, including:

- sampling locations, time and methods
- collection procedures
- preservation requirements
- safety precautions (some samples require use of chemicals to preserve or stabilize the sample)
- how to interpret laboratory results
- the use of these results to improve the process
- what should be in laboratory supply and chemicals inventory
- recommended laboratory equipment, supplies, chemicals and a list of laboratory references
- instructions for completing worksheets (include examples and sample worksheets)

For tests to be performed by outside laboratories, the name of the laboratory, contact person, telephone number, shipping procedures and method of requesting sample pick-up or schedule for sample pickups should be provided.

The appendices of the O&M manual may include detailed design criteria, shop drawings, as-built drawings, manufacturers' manuals and warranties, valve indices or schedules, piping color codes, copies of system permits, or local drinking water ordinances.

Ask the operator where the O&M manual is kept and how often it is reviewed and updated. Updates should occur yearly at a minimum.

A **benchmarking program** is the process of determining who is the very best, who sets the standard, and what that standard is.

Benchmarking allows you to compare your system with others, to identify comparative strengths and weaknesses, and learn how to improve. It's a way of finding and adopting best practices. Steps involved in benchmarking include:

- identification of problem areas (procurement, customer service, employee relations, or other areas you feel your system should improve upon)
- identification of other industries that have similar processes
- identification of the leaders in other industries
- surveying the leaders for measures and best practices
- visiting best-practice companies for leading-edge practices
- implementing the new business practices
- evaluating how well the new business practices improved the problem areas

Benchmarking is a more structured way to accomplish what you probably already do in your life outside the boardroom—talking to your fellow business owners, coworkers, or parents about problems in your life, exchanging tips on how to do something better, and trying out the tips in your own situation to see if it improves. The difference is in the *measures* of best practices. It's not enough to say, "We must improve customer service." You actually need to quantify the improvements you are looking for and then measure how well a new system works. Example: "We must improve customer service by decreasing wait times by 30 percent ." Find out if your system has a benchmarking program and on what areas it is currently focusing.

Both water and wastewater treatment systems employ operators who are required to have state-regulated training and **certification**. Requirements for certification may be based

on the type of system (groundwater vs. surface water), the type of treatment being used, or the size of the system (based on either the number of connections or the treatment capacity of the system). Find out what level is required for your operators and whether your operators are certified at that level or are working toward certification. Links to websites for state operator requirements and testing are available on the American Water Works Association (AWWA) website at [www.awwa.org/Resources/operator.cfm?ItemNumber=6356&navItemNumber=32937](http://www.awwa.org/Resources/operator.cfm?ItemNumber=6356&navItemNumber=32937). RCAP regional partners in some parts of the country offer operator training as part of their programs. Visit their websites for more information:

- RCAC, the Western RCAP: [www.rcac.org/doc.aspx?58](http://www.rcac.org/doc.aspx?58)
- Midwest Assistance Program, the Midwest RCAP: [www.map-inc.org/solutions\\_training.html](http://www.map-inc.org/solutions_training.html)
- RCAP Solutions, the Northeast RCAP: [www.rcapsolutions.org/trainings.htm](http://www.rcapsolutions.org/trainings.htm)

In addition to the required technical training and experience, operators should have safety training in confined-space entry, trenching, basin safety, chemical and gas handling, lock-and-tag procedures, driving and traffic safety, and heavy-equipment operation. They should also be trained in accident/spill response and in first aid. Find out where the training records are kept, and ask your operator whether he or she thinks the safety training was effective and what additional training might be beneficial to the performance of his/her job.



# Regulatory Responsibilities

In the United States, we enjoy safe and protected public drinking water supplies and effective wastewater treatment technologies. All of us receive benefits from these services every day—and multiple times each day. Every time we drink a glass of water from the tap, it does not taste foul, or when we flush the toilet, we do not have to deal with the waste. On a more basic level, these individual and collective benefits are the result of public drinking water and wastewater infrastructure that protects and preserves public health and undergirds economic vitality in your community.

The number one concern for you as the governing body of your water utility is to protect the public's health while maintaining **compliance** with state and federal regulations. Your certified operator is on the front lines of these protection and compliance efforts, making sure that your treatment facility operates in accordance with state and federal regulations and that all required tests, reports, public notification and recordkeeping procedures are followed. As a board member, it is your duty to support the operator as he or she carries out these functions and to be knowledgeable of the consequences for failing to do so. Board members of water and wastewater treatment facilities are bound by law to follow requirements spelled out in several U.S. Environmental Protection Agency (EPA) regulations. An illustration of how EPA regulations are developed is in Appendix B.

## Safe Drinking Water Act

The **Safe Drinking Water Act** (SDWA) was passed by Congress in 1974 and was amended in 1986 and 1996. It applies to **public water systems** (PWS) serving 15 or more connections or an average of 25 people or more each day for at least 60 days per year. The owner or operator of the water system is responsible for meeting the requirements of the SDWA. There are three types of PWS:

- **Community water systems** (CWS) supply water to the same population of residents year-round.
- **Non-transient, non-community water systems** (NTNCWS) supply water to at least

25 of the same people at least six months each year, but not their residences. Examples of NTNCWS include factories, schools or daycares that have their own water supplies.

- **Transient, non-community water systems** (TNCWS) provide water in a place where people do not live continuously, like restaurants, motels, rest stops or campgrounds with their own water supplies.

Water systems use a “multiple-barrier approach” to protect public health. The first barrier is to have a safe, protected water source. To give water utilities and community members the information they need to decide how to protect their drinking water sources, the SDWA requires that the states develop EPA-approved programs to carry out



assessments of all source waters in the state. The source water assessment is a study that defines the land area contributing water to each public water system, identifies the major potential sources of contamination that could affect the drinking water supply, and determines how susceptible the public water supply is to this potential contamination. Public utilities and customers can then use the publicly available study results to take actions to reduce potential sources of contamination and protect drinking water through use of a **source water protection plan**. The second barrier is treatment of the water source by a certified operator. The third barrier is the proper operation and maintenance of water-storage facilities and distribution systems by licensed operators. And the fourth barrier is providing information to consumers on the quality of the water and health effects.

The SDWA requires water systems to prove that they are using the multiple-barrier approach effectively by mandating water sampling and testing for:

- inorganic chemicals
- microbiological contaminants
- organic chemicals
- radiological contaminants
- turbidity
- unregulated contaminants
- disinfection chemicals and disinfection byproducts

These chemicals and contaminants are assigned **maximum contaminant levels** (MCLs) allowed in drinking water. MCLs are enforceable standards for the highest level of a contaminant allowed in drinking water. If the amount of the chemical or contaminant is technically difficult to measure, or if the cost of the measurement is excessive for small systems, a **treatment technique** (TT)

may be necessary. A TT is a required process intended to reduce the level of a contaminant in drinking water. Examples of TTs are the Lead and Copper Rule requirements and the Surface Water Treatment Rule requirements. Tables that describe MCLs or TTs for the various regulated contaminants are included in Appendix C.

Most water system records are considered public information. Personnel files and information that is confidential due to security concerns are *not* public information. Customers have the right to inspect public water system records, and copies of the records must be provided on demand. Each state has unique “Public Information” laws that dictate what records are deemed public information so it is advisable for you to be aware of these requirements for your state. Providing a comprehensive **consumer confidence report** (CCR) can assist your system in keeping customers informed and confident that their system is providing them with quality service. A sample CCR may be found in Appendix I. The following records must be kept in the water treatment facility:

- copies of laboratory results, including the name of the person who collected the samples
- dates and locations of sampling points
- records of **contaminant level violations** and specific steps taken to correct the violations
- sanitary survey reports
- all other water-quality information and/or operator’s logs

**Public notification** is required by the SDWA when the water system violates any regulation. There are two classifications of violation. Tier 1 violations include maximum contaminant level violations, treatment technique violations, and non-compliance with variance or exemption schedules. Tier 2 violations include non-compliance with monitoring requirements, testing

procedures, or **variances** or **exemptions**. A variance or exemption is a *very* rare occurrence. It is when the EPA or state drinking water regulatory agency allows a drinking water system having extreme technical or financial problems to provide water to the public for a limited time. The supplier must prove that having the variance or exemption poses no threat to public health. RCAP believes that there should be no dual standards—everyone is entitled to universally high standards protective of public health. Variances generally allow a water system to provide drinking water that may contain contaminants at levels above the MCL

on the condition that the quality of the drinking water is still at a level to protect public health. An exemption, on the other hand, is intended to allow a system with compelling circumstances an extension of time before the system must comply with applicable SDWA requirements.

A Tier 1 violation is more serious than a Tier 2 violation. Tier 1 violations may be addressed by your state with civil suits that could cost your water systems millions of dollars or require plant and distribution system improvements. The following table illustrates how public notification is to be performed for various violations.

## Public Notification Requirements

VIOLATION OR CONDITION	REQUIRED NOTIFICATION		
	Mail	Newspaper	Broadcast
Acute violation of MCL (Tier 1)	X	X	X
Non-acute violation of MCL (Tier 1)	X	X	
Failure to follow compliance schedule (Tier 1)	X		
Failure to monitor (Tier 2)	X		
Failure to use approved testing procedure (Tier 2)	X		
System granted a variance or exception (Tier 2)	X		

The SDWA requires the following recordkeeping in support of public information:

- Bacteriological analyses are kept for a minimum of five years.
- Chemical analyses are kept for a minimum of ten years.
- Written reports (such as engineering analyses and sanitary surveys) are kept for a minimum of ten years following completion.
- Variances and exemptions are kept for a minimum of five years following their expiration.
- Actions taken to correct a violation are kept for a minimum of three years after the last action.

Since the last amendment to the SDWA, various federal rules and regulations have been passed to clarify and strengthen the SDWA. Following are brief descriptions of rules and regulations pertaining to water.

Arsenic can enter water supplies from natural deposits in the earth or from agricultural or industrial runoff. If the amount of arsenic in the source water is less than the MCL of 10 µg/L (**parts per billion**, or ppb), the Arsenic Rule requires water systems that have surface water as their source to sample for arsenic once a year, and those that have groundwater as their source to sample once every three years. If the amount of arsenic in the source water is greater than the MCL, the system must sample quarterly until the system is reliably and consistently below the MCL. Plus, if the sample is above 10 µg/L, the system must find alternative sources of water (which could include **blending**) or conduct treatment to remove arsenic to below the MCL. This rule has been in place since 2006.

Inorganic chemicals, synthetic (human-made) organic chemicals, and volatile organic chemicals are regulated under the Chemical Phase Rules. Your water system may have to monitor for these chemicals once every three years, or it may have received a waiver for one or more of the chemicals from your state regulatory agency, based on a determination that your system is not susceptible to contamination or that the chemicals were not used in your area.

The Lead and Copper Rule was enacted in 1991 to protect consumers from metals that leach into drinking water from home plumbing. Water systems monitor lead and copper at consumers' faucets. If lead concentrations exceed an **action level** of 15 µg/L (ppb) or copper concentrations exceed an action level of 1.3 mg/L (**parts per million**, or ppm) in more than 10 percent of customer taps sampled, the system must undergo

additional actions to control corrosion and must rule out their source water as a significant contributor of lead. If the action level for lead is exceeded, the system must also inform the public about steps they should take to protect their health. The system may also have to replace lead service lines under their control. In addition, a CWS or NTNCWS may be required to keep records of all lead and copper results and water quality parameters for at least 12 years.

Vulnerable community water systems had to monitor for radionuclides at each entry point in their distribution systems to get a baseline for the Radionuclides Rule, which originally was passed in 1977 and was updated in 2000. If the samples contain radionuclides equal to or below the MCL, the systems have to be monitored every three, six or nine years (depending upon which contaminant is present and its amount). If the samples contain radionuclides above the MCL, system samples are required quarterly. Your state will be able to provide you with information on if and how often your system will have to monitor for these contaminants.

The Filter Backwash Rule was established in 2001 and is intended to protect consumers from microbial contamination, especially **Cryptosporidium**. Recycled flow from filter backwashing operations, thickener supernatant and liquid from dewatering processes have to re-enter water treatment plants at the beginning of treatment (or at an alternate, state-approved point of treatment).

Groundwater systems may be subject to fecal contamination, which contains microorganisms and viruses (specifically, **rotavirus** and **echovirus**). Such systems are regulated with the Ground Water Rule of 2006. Periodic sanitary surveys of systems require the evaluation of eight critical elements of a public water system:



- source
- treatment
- distribution system
- finished water storage
- pumps, pump facilities, and controls
- monitoring, reporting, and data verification
- system management and operation
- operator compliance with state requirements

Sanitary surveys also require the identification of significant deficiencies (for example, a well located near a leaking septic system). Source water monitoring is triggered when a system that does not already treat drinking water to remove 99.99 percent (also known as 4-log removal) of viruses identifies a positive sample during its Total Coliform Rule monitoring and assessment monitoring (at the option of the state) targeted at high-risk systems. Corrective action is required for any system with a significant deficiency or source water fecal contamination. Compliance monitoring is required to ensure that treatment technology installed to treat drinking water reliably achieves 99.99 percent inactivation or removal of viruses.

The Long-Term I Enhanced Surface Water Treatment Rule (also known as LT1) was finalized in 2002 and applies to both systems that use surface water and systems that use **groundwater under the direct influence of surface water** (abbreviated GWUDI). All small water systems must achieve a 99 percent (also known as 2-log) removal of *Cryptosporidium*. Filtered systems must comply with combined filter effluent turbidity performance requirements to meet the removal criteria, and conventional and **direct filtration** systems must continuously monitor turbidity at each filter. Systems have to monitor their effluent to show that disinfection byproduct (DBP) levels are less than 80 percent of the MCL, or they have to develop a profile of microbial

inactivation levels (a **disinfection profile**) for their treatment process. If a system changes its method of disinfection, the state must give prior approval. New, finished water reservoirs must be covered. If the system is unfiltered, the system's watershed control plan must specifically mention *Cryptosporidium* as a "pathogen of concern."

The Long-Term II Enhanced Surface Water Treatment Rule (also known as LT2), came into effect for small systems in 2008 and improves the control of microbial pathogens, specifically *Cryptosporidium*, ***E. coli***, and ***Giardia lamblia***.

Filtered water systems are classified in one of four treatment categories (called "bins" in the regulations) based on their monitoring results. If your water system was classified in the lowest bin, you have no additional requirements.

Systems classified in higher bins must provide additional water treatment to further reduce *Cryptosporidium* levels by 90 to 99.7 percent (1.0 to 2.5-log), depending on the bin.

Systems will select from different treatment and management options in a "microbial toolbox" to meet their additional treatment requirements. All unfiltered water systems must provide at least 99 or 99.9 percent (2 or 3-log) inactivation of *Cryptosporidium*, depending on the results of monitoring. Systems that store treated water in open reservoirs must either cover the reservoir or treat the reservoir discharge to inactivate 99.99 percent (4-log) virus, 99.9 percent (3-log) *Giardia lamblia*, and 99 percent (2-log) *Cryptosporidium*. Systems must conduct a second round of monitoring six years after completing the initial round to determine if source water conditions have changed significantly.

If your water system uses ultraviolet light for disinfection, or if it has a waiver from your state, you don't have to complete monitoring or treatment to comply with the Stage 1 Disinfectants and Disinfection Byproducts Rule (also known as Stage 1 DBP). Otherwise, small systems have

had to be in compliance with this rule since 2004. If your system adds chlorine, chlorine dioxide, or ozone to disinfect water supplies, the chemicals can react with naturally occurring organic chemicals to produce unintended byproducts that may cause cancer. The maximum residual disinfectant level (MRDL) for each of these chemicals is listed in Appendix C. And conventional water systems are required to remove some of the organic chemicals (known as disinfection byproducts precursors) from their raw water using enhanced coagulation, enhanced softening, or an alternative compliance technology.

The Stage II Disinfectants and Disinfection Byproducts Rule (also known as Stage 2 DBP) applies only to CWS and NTNCWS, not to TNCWS. Compliance monitoring of total **trihalomethanes** (TTHM) and **haloacetic acids** (HAA5) to meet the requirements of this rule begins on October 1, 2013. Small groundwater systems that serve fewer than 10,000 people monitor DBPs at two sites in their distribution systems once each year. Small surface water systems that serve fewer than 500 people do the same. Surface water systems that serve between 500 and 3,300 people are required to take individual samples of TTHM and HAA5 (instead of a dual sampling set) at the locations with the highest concentration of trihalomethanes and haloacetic acids, respectively. Surface water systems that serve between 3,301 and 10,000 people monitor DBPs at two sites in their distribution systems once each quarter.

Effective in 1990, the Total Coliform Rule requires monthly sampling for total **coliforms**. Coliform bacteria may enter water systems through cross-connections, backflow incidents, line breaks or compromised water sources. The EPA uses coliform bacteria as indicator organisms—that is, their presence indicates that the system is vulnerable to pathogens and a warning that your water system may be contaminated with fecal material. The

## TIP



Check the EPA website ([www.epa.gov](http://www.epa.gov)) for new regulations and guidance at least once every six months.

number of routine samples required ranges from one per month for systems serving fewer than 1,000 people to ten samples per month for systems serving 10,000 people. If coliform bacteria are present in a sample, repeat sampling is required.

## Clean Water Act

The Clean Water Act (CWA), originally called the Federal Water Pollution Control Act, was placed into law in 1948, and was the first major U.S. law to address water pollution. It was reorganized and expanded in 1972 and amended in 1977. The CWA amendments in 1977 included:

- establishing the basic structure for regulating **pollutants** discharged into the waters of the United States
- giving EPA the authority to implement pollution-control programs, such as setting wastewater standards for industry
- maintaining existing requirements to set water quality standards for all contaminants in surface waters
- making it unlawful for any person to discharge any pollutant from a **point source** into navigable waters, unless a permit was obtained under its provisions
- funding the construction of sewage treatment plants under the construction grants program
- recognizing the need for planning to address the critical problems posed by **non-point source** pollution

Changes in 1987 phased out the construction grants program and replaced it with the State Water Pollution Control Revolving Fund, more commonly known as the Clean Water State Revolving Fund (CWSRF). This new funding strategy addressed water quality needs by building on partnerships between EPA and states.

The CWA contains several rules and regulations for wastewater treatment plants:

- **National Pollutant Discharge Elimination System** (NPDES) permit program including the Pretreatment Streamlining Rule
- The Biosolids Rule for sludge
- Total Maximum Daily Load (TMDL) and Impaired Waters Rules
- Water quality-based control standards

Publicly owned treatment works (POTW) and other centralized wastewater treatment systems are not intended to handle industrial waste. They are intended to treat conventional household waste and biodegradable commercial/industrial waste. Generally, primary treatment consists of removing solids (cans, paper, plastic, and other items) from wastewater coming into the system, and secondary treatment entails removing organic components from wastewater before returning the cleaned water back into the environment. To ensure that the receiving waters are adequately protected, the National Pollutant Discharge Elimination System (NPDES) requires all entities that discharge into waters to obtain permits, including wastewater treatment systems. Those contaminants specifically required to be removed from POTW effluent are listed in Appendix D.

In the past, many industries treated sewer systems as a convenient receptacle for waste of all sorts. Because of this, industrial and non-biodegradable waste could enter the collection system. This practice led to the formation of

toxic gases, explosions, interference or disruption of the processes used by wastewater treatment systems, or pass-throughs (when a constituent is not removed by primary or secondary treatment and passes through the treatment system, which can cause the POTW to violate its NPDES permit). The Pretreatment Rule (1978) requires industrial and commercial point sources to reduce or eliminate these wastes before discharging their wastewater to any collection system. There are 129 different priority pollutants listed in the Pretreatment Rule.

Because much water contamination comes from non-point sources, such as agriculture, forestry, development activities and road runoff, the EPA has authorized states to develop **water quality-based control standards**. The standards designate for what purpose a body of water is to be used (drinking water, recreation, or fish and wildlife habitat) and the amount of a pollutant that can be assimilated by the water body without impairing its designated use (plus a margin of safety). If no applicable water quality standards exist, the state establishes **total maximum daily load** (TMDL) criteria for a given contaminant.

40 Code of Federal Regulations 503 contains the Biosolids Rule. Biosolids are treated wastewater sludges that are recycled and applied as fertilizer to improve and maintain productive soils and stimulate plant growth. The Part 503 rule governing the use and disposal of biosolids contains numerical limits for metals in biosolids, pathogen-reduction standards, site restriction,

Everybody is downstream from somebody else. Know where your effluent (waste) goes!



crop-harvesting restrictions and monitoring, recordkeeping and reporting requirements for land-applied biosolids, as well as similar requirements for biosolids that are surface-disposed or incinerated. Standards have been proposed to include requirements in the Part 503 Rule that limit the concentration of dioxin and dioxin-like compounds in biosolids to ensure safe land application. About 50 percent of all biosolids are recycled to land, and all 50 states use land application of biosolids.

## State or Tribal Regulations

Individual states and tribes are allowed to impose their own regulations on water treatment and

wastewater treatment. These regulations must satisfy federal regulations at a minimum but may be even more stringent. State and tribal regulatory information is available on the EPA's website at [www.epa.gov/lawsregs/states/index.html](http://www.epa.gov/lawsregs/states/index.html) and <http://water.epa.gov/aboutow/ogwdw/tribal.cfm>. Consult your state regulators to determine if there are other regulations with which you are required to comply. For specific state or tribal requirements, applications, permits, and forms, contact your state, tribal or federal **primacy agency**.

### THE TOP TEN PIECES OF ADVICE FOR BOARD MEMBERS FROM PAT KLINE, WHO AUTHORED AND COMPILED MANY PARTS OF THIS GUIDE

1. Bring snacks to meetings. Food always makes a meeting more bearable (and gets people to come).
2. Befriend regulators. They are not the enemy but are there to assist you in providing for and protecting the public's health.
3. Understand how to compromise effectively.
4. Know the rules under which your board operates, and follow them.
5. Understand your treatment system from start to finish.
6. Show up to every meeting, and contribute regularly.
7. Treat all customers, co-workers, contractors, and employees with respect and dignity.
8. Laboratory analyses, budget line items, the size of your system and what it does—all are described in numbers, and all of the numbers have meaning. Know what the numbers mean.
9. Don't be afraid to ask questions.
10. "Be the change you want to see in the world." (quote by Mahatma Gandhi)

# Board Business

## Legal Authority

The federal government, states or tribal laws can authorize local entities to provide water and wastewater disposal services to the public. In other words, local organizations in the community can provide water/sewer service if they are granted that right by the federal government, state or tribe. You as the board of directors or governing body are directing a system that is given its authority to operate by the state or your tribe. Therefore, the laws of your state or tribe regulate your services. With the authority and responsibilities you as the governing body are expected to carry, you need to know the laws and regulations your board needs to follow.

The legal right to supply public water services can be granted to different types of entities. Some are public entities like municipalities, counties and parishes, or public-service districts (improvement or utility districts). Others are nonprofit bodies, such as nonprofit corporations, including homeowners associations.

The state or tribal laws that grant this authority vary, but most will include at least the following:

- the legal process for forming and governing the entity
- general and specific powers granted to the entity by the state or tribe
- powers or authority prohibited by the state or tribe
- a variety of other special provisions relating to the functioning of the entity, such as legally prescribed methods of operation, recordkeeping, and reporting requirements to specific state or tribal agencies and authorities

It is each board member's responsibility to become familiar with and knowledgeable about:

- state or tribal laws granting that system the authority to operate

- the municipal or corporate charter
- county or municipal ordinances establishing the system
- articles of incorporation and bylaws
- any other documents relating to the organization and structure of the system

Without a full understanding of the authority and responsibility granted to the system, you as a decision maker for that system cannot exercise prudent or proper judgment.

## Roles of Board Members

Who are the members of your board of directors? Many water and wastewater system boards have the following structure:



- Officers: president, vice president, secretary and treasurer
- Other members

The leader of the board may be called the president or the chairperson. He or she:

- ensures that the board is carrying out duties that are mandated by law or board policy
- facilitates meetings to keep them on schedule and on task
- ensures that the board's business gets done between meetings
- appoints board members to committees to accomplish the work of the board
- acts as the liaison between the board and the facility manager (if your facility has a manager) or the operator
- fosters a spirit of teamwork among the board's members

The board's vice president takes over the president's duties when the president is absent. The vice president must know the president's duties and may have other duties of his/her own, like being a committee member.

The secretary of the board takes minutes at the meetings and is responsible for the care and maintenance of historical documents for the board. The secretary functions as the board's "memory" and oversees the information that is kept on the board in the form of paperwork and other records.

The board's treasurer oversees the financial aspects of the board's work, ensures accurate financial recordkeeping, sees that an annual audit is performed, assists in the preparation of the budget, and interprets financial reports.

Even if you don't have a title, you are still a vital part of the board. Your role is to provide guidance and support to the other board members and

employees of the water system. Your presence is necessary at board meetings to make up the board (help meet a quorum), and you should actively participate in the board's activities. Pay attention to the policies, finances and regulatory compliance of your facility. Treat all customers fairly, respectfully and equally when they bring their problems or complaints to the board.

Whether you were appointed, elected, or have volunteered to be a board member, you will find that much of the work is common sense. There will be many different educational and training resources to aid you in applying your common sense. You will, however, have many demands placed on you, and some may compete with each other:

- Your customers want to trust that you can provide clean, good-tasting drinking water on demand and efficient, thorough wastewater treatment for the lowest cost possible.
- State, tribal and federal regulators want monitoring and testing according to the rules.
- Your operators want the tools, equipment and training to perform their jobs efficiently.
- You want to be confident and know that you have made decisions rationally and ethically within your budgetary constraints.

The board is legally and morally responsible for all aspects of the water or wastewater system, including employee supervision, finances, operation and maintenance, planning, and complying with regulations. Keeping that in mind, how do you satisfy everyone?

The first step in working efficiently together as a board is to ensure that you are following the rules. If your system is structured as a private entity, the rules may be different from those followed by one that is structured as a public or nonprofit entity. State, tribal and federal laws that grant the authority to provide water and wastewater services typically spell out:



- procedures for purchasing and procuring goods and services
- freedom of information and open meeting laws
- procedures for accounting and auditing financial records
- ethics standards applicable to boards and council members
- insurance and bonding for public facilities and public officials
- laws affecting the ability to incur debt by the entity
- rights of eminent domain and property acquisition
- laws regulating service areas or establishing service boundaries
- laws dealing with sales taxes, use taxes, franchise taxes, and income taxes
- labor relations statutes of all types
- laws affecting the frequency, form, and general conduct of the meetings of boards of directors
- contracts and contracting for services and/or construction activities
- proper recordkeeping and reports relating to system operation and management

Know what rules and laws pertain to your business and follow them.

## Mission Statement

If the board hasn't done so already, it may want to write a mission statement (sometimes called a statement of purpose). A mission statement spells out what your system is working to achieve. It gives your system focus and points everybody's efforts toward a common purpose. Consider the following questions:

- Why does your system exist?

- What is your general plan for setting rates?
- What are your service-provision goals?
- In what way will your business operate?
- Whom should you seek to serve?

When you come to a statement for each of the above questions that the entire board can agree to, write it down. The discussion process that comes from developing a statement of purpose can give board members the chance to develop closer ties, share plans for the future, and better understand differences of opinion. Having a clear statement of purpose is like using a compass—it helps keep all the day-to-day and long-term decisions pointed in the right direction.

This is a recommendation for your overall system to have a mission statement—to determine and share, especially with customers, what the system's business mission is. You could also consider having an internal mission statement for the board of directors only that would address how it wants to lead or govern the system. Such a mission statement would be a very useful tool in helping board members focus their work in their roles because it would be specific to a certain group of people.

## Rules for Conducting Board Meetings

Do you feel like your board meetings are disorganized, run too long, waste time, or avoid important discussions? For these reasons, among others, the rules for conducting meetings should be in writing and followed at each meeting. The rules for conducting your board meetings may be driven by state statutes depending upon the organization of your board (mutual domestics, nonprofit corporations, special districts, city or town utilities), so understand where your rules originate, and follow them. At a minimum, your



board's rules for conducting meetings should include:

- the procedure for scheduling meetings and notifying board members and the public
- what items are to be included in the written agenda
- how minutes are to be taken
- the rules for making motions
- any other rules that will make doing business easier

Meetings should be scheduled for the same week during each month and for the same day during that week (the third Tuesday of each month, for example). Being consistent like this makes it easier for board members to schedule their personal and professional lives around the meetings. Try not to miss a meeting unless you are sick or a true emergency arises. Many boards find it effective to remind members by email a week before the meeting occurs and then follow up with a phone call a few days prior to the meeting.

A written agenda covers the business to be discussed and should be sent to the board members with the mailed meeting reminder. An agenda should contain the following items:

- call to order and proof of quorum
- evidence of notices of when the meeting is held
- reading and acceptance of the previous meeting's minutes
- board officer, committee, financial and manager/operator reports
- election and voting results (if applicable)
- unfinished business (if applicable)
- new business
- adjournment

Agendas should be specific enough that every board member knows what is to be discussed but not so detailed that the agenda takes up more than one page. Proof of a quorum at the meeting can be as simple as a sign-in sheet or as formal as a roll call. Reading and acceptance of the previous meeting's minutes should be taken very seriously. Minutes are the legitimate record and legal proof of the board's business decisions. Unfinished business is required to be discussed and voted upon before new business can be brought up. The new business element should contain enough information so that board members can think about the topic, obtain information about it, and be prepared for the meeting.

To speed up the agenda a bit, your board may want to use a **consent agenda** for items that need to be voted upon but do not need further discussion. Common items on a consent agenda are approval of meeting minutes and acceptance of reports that are attached to the minutes, all in hard-copy form. A consent agenda prevents wasting time on matters that have already been discussed, reported, and evaluated. If a board member wants to discuss an item on the consent agenda, he or she can always move that the item be placed on the regular agenda.

Because minutes are the legal record for board actions, accuracy is of the utmost importance. Copies of the minutes should be distributed to the board as soon as they are developed from the notes and as soon after the meeting as possible to give the members time to comment on them while their memory of the meeting is still fresh. After the minutes are accepted and finalized (with any changes that need to be made), they should be redistributed to the board for acceptance. Minutes should include:

- the purpose of the meeting (regular, special, emergency, annual)
- time, date and location of the meeting



- the names of board members in attendance and names of those absent
- the matters discussed, actions taken, and votes on actions (in order of occurrence)
- precise wording of the motions made, who made the motions, who seconded the motions, and how each board member voted (yea, nay or abstain)
- time, date and location of the next meeting
- the time the meeting was adjourned

Many boards use *Robert's Rules of Order*, a comprehensive guide for meetings of any type, as their basis for business. Appendix E contains two tables of parliamentary procedures that are condensed from this reference. Being knowledgeable about the entire contents of *Robert's Rules of Order* requires a lot of study, and most small board members don't have the time to study them. Instead, they use their own short set of rules of conduct, which are not allowed to conflict with *Robert's Rules of Order*. If your board doesn't have a short set of rules, it may want to consider adopting the example below.

## Example Short Set of Rules for Conducting Board Meetings

1. The chairperson is responsible for presiding over business meetings and following the rules of conduct.
2. A member is recognized by the chairperson when no other business is "on the floor" (currently under discussion). The member then presents the motion.
3. Another member seconds the motion. If there is no second, the motion dies.
4. If there is a second to the motion, the chairperson restates the motion either as written by the member or as written by the secretary. All motions made and seconded must be written to ensure accuracy. The motion should include what is to be done, who is to do it, how much is to be spent, and when it is to be done.
5. The chairperson calls for discussion. The board member who made the motion is entitled to be recognized first. Each member may comment on the motion twice, but the second comment may be stated only after *all* board members have made a first comment. Discussion is limited to 3 minutes per comment, unless the chairperson decides that discussion should be extended. If there is no discussion, or after the discussion has ended, the chairperson calls for a vote on the motion.
6. A written amendment to the motion can be made when a member is recognized by the chairperson and another member seconds the amendment. If there is no second, the amendment dies. If there is a second to the amendment, the chairperson restates the amendment, either as written by the member or as written by the secretary. The chairperson calls for discussion of the amendment, following the same steps as in 5. The chairperson calls for a vote on the written amendment. If the amendment is adopted, the chairperson calls for a vote on the amended motion. If the amendment is *not* adopted, the chairperson calls for a vote on the original motion.
7. When a vote is called for, the vote is announced, and the exact wording of the motion and the vote of every member is recorded in the minutes.
8. If a member is disruptive, abusive or refuses to follow the rules, that member may be asked to leave. If the member refuses to leave, charges of disturbing the peace may be brought against him or her.



9. If the chairperson does not follow the above rules as prescribed in the policy of the board, members may ask for a procedural explanation from the chairperson. The chairperson (or parliamentarian, if your board has designated such a person) is responsible for ensuring that a copy of the rules is available at every meeting.

Other rules that your board may want to implement for efficient meetings are:

- posting the time, date and location of regular board meetings in a publicly accessible place (on your website, on the community bulletin board at the grocery store, etc.)
- non-board members (such as customers) must submit requests for agenda items to a board member
- making distribution of the meeting minutes within one week of the meeting mandatory
- making contact with the chairperson mandatory for discussion of new problems or issues a minimum amount of time prior to the meeting (the chairperson has final say over whether the problem or issue is included on the agenda for the meeting)

You will need to know whether state statutes regarding your board's legal configuration require the board to establish rules for **proxy voting**, definitions of "attendance" (that is, does the member have to be physically present at the meeting to vote, or is phoning in a vote allowed?), or other special situations.

You can see that working together as a team is quite important for your board to function well. To encourage teamwork, actively listen to other members of the board, and try to understand their perspectives and positions. Each board member brings his or her unique experiences, knowledge and feelings to the meetings, and that is often the beauty of a board. Rather than one person

making decisions, a board can collectively make a decision (many heads are better than one), and boards are often composed carefully so different expertise and perspectives are brought in. One member might be an accountant, while another knows what it's like to run a business. Treat each other with respect and courtesy, and reach consensus where possible. Be supportive of the board and the decisions it makes, even if a vote doesn't result in favoring your position. If this doesn't happen, conflicts can arise, and this works against the efficiency of a board and can lead to worse things.

## Conflict Resolution

Conflict resolution is a big part of a board's business. Conflict occurs because individuals have different values, goals, positions and perceptions. Conflict can actually be a good thing. When it leads to open discussion and debate of issues, you hear points of view you may not have considered when forming your own opinion. Many people avoid conflict, however, because of the potential for problems. Belittling comments, carrying anger from one issue to another, and raised voices can make conflict stressful or unpleasant. Failure to agree on an issue doesn't mean the end of the world. Look for ways to compromise. Here are some tips on conflict resolution:

- Listen to the other members of the board, and try to understand their perspectives and positions.
- Ensure that each board member has individually expressed his/her opinion; don't let one board member dominate the discussion or assume he or she is speaking for others.
- Look for common ground and/or break up the conflict into smaller issues that can be resolved one by one. Be prepared to concede

on some of the component issues if it allows for consensus on the primary issue.

- Allow each issue to stand on its own merits. Do not allow a disagreement on one issue affect your decision on other issues.
- Leave any disagreements with other board members at the meeting. Remember that you will be working with these board members for quite a long time.
- Work toward consensus on all board decisions; avoid the appearance that the board is split on every important issue facing the system.
- When discussing agenda items, state opinions clearly in a courteous and respectful manner. Remember that your customers elected *all* the board members, and each brings his/her own expertise and experience to the discussion.
- If you agree with others' opinions, say so. Be supportive whenever possible. If you disagree, do so in a cordial and respectful manner. Speak for yourself only, and use statements that begin with "I" ("I believe..." or "I feel..."), rather than attacking someone else's opinion (not: "He doesn't believe...").
- If board decisions result from a split vote, accept and support the majority decision.
- Seek out training or education sessions on conflict management.
- When a vote is taken, move on to the next issue with an open mind, whether you were in the majority or minority.
- Never take boardroom disagreements outside the boardroom. Don't look for agreement on your viewpoint with non-board members.
- Compromise is not defeat. Look for ways to compromise.
- Express your viewpoint and respect the viewpoints of others. Accept the fact that

others will not always agree with your viewpoint.

Remember the goal is to seek consensus on the issues, not simply majority votes.

## Management Duties

If your system is able to hire a manager, your board will rely on him/her to perform the following tasks and require him/her to report on those tasks to make its decisions. However, many small systems don't have the budget to hire a manager, so the board performs management duties. Management of a water or wastewater treatment facility (distinct from the functions at the level of a board of directors) requires attention to all of the following:

- employee and customer relations
- financial operations and management
- operations and maintenance of the facility and infrastructure
- planning and development
- regulatory compliance

It's nearly impossible to make good decisions on these matters when you are unfamiliar with your system. A simple way to share responsibility is to split oversight of these duties among the board members. Each member of the board may have a talent or interest in one of the specific categories above, or the duties may be rotated every few months. If your board has more than five members, you might assign small committees of board members to each of the categories.

After the board member or committees have an assignment, they are responsible for that assignment, including fact-finding, setting and implementing objectives, oversight and reporting to the full board. The fact-finding step exists to determine what is currently being done, what should (or should not) be done, and things that

should be done better. Setting objectives for the future is fairly self-explanatory, but implementing the objectives is a little harder—there may be several ways to implement the objective, and the member/committee should detail pros and cons for each method. A report to the full board from the member/committee should be required at each board meeting.

If your system has a manager, let him/her do the job of managing. There is sometimes a fine line, but a line nonetheless, that boards of directors should abide by that separates the responsibilities of a board and those of a manager. Boards should focus on higher-level issues of strategy and policy and set larger goals and directions for the system, while managers implement these desires. One school of thought on this division of roles relates the board to the legislative branch of a government, while the management is like the executive branch. The board establishes the rules and sets parameters for operating a system, while the management enforces the rules and carries out the day-to-day tasks to run the system.

Many boards begin losing their efficiency when they start taking on management responsibilities. This is an easy trap to fall into. A manager comes across many problems in the day-to-day management of a system, and many are challenges that arise in every typical office environment. It is then tempting for individual board members or the board as a whole to get involved and want to fix a problem. It is also sometimes challenging to know when a problem rises to the level that warrants board consideration. A board chair with experience working with management and with good discernment skills can navigate these situations well and can know when to bring an issue before the board or let management resolve it on its own. Boards and managers that have a good working relationship and trust each other will be able to keep these functions separate and complementary rather than mixing them.

## Example Member Assignment

Jerry is a new volunteer board member who owns a hardware store and is also interested in customer service. In fact, he volunteered to be a board member because he was unhappy with how a friend's service complaint was handled. He decides to take responsibility for the system's employee relations and customer service.

Starting with the fact-finding step, Jerry investigates how customer complaints are currently being handled. He finds that customers phone in to complain and leave a message on voicemail. The secretary checks the voicemail once a day and passes any messages to the operator, who will drive to the customer's home to explore the problem. The operator may need to return later to fix the problem, but sometimes this process takes several days. Delays in repairs are mainly due to a lack of spare parts, which have to be ordered and shipped from the nearest city. Sometimes the delay is caused by the method in which the message is received—the secretary works only part-time, so if a call comes in after he leaves, it doesn't get forwarded until the next day. Jerry believes that a realistic goal for customer service would be a maximum of 48 hours for resolution of customer complaints.

Jerry realizes that there are several ways to cut the average time to address customer complaints. These methods include:

- purchasing a cell phone dedicated to customer service, which the operator on duty answers directly
- having the operator call the customer back to get a better idea of the issue before making the initial trip
- keeping an inventory of the most commonly used spare parts and pipe repair kits on hand

Each of these has an associated cost—a dedicated cell phone costs money for the initial purchase and monthly plan, changing the service call number on stationery, billing and your website will cost money and time, and keeping an inventory involves the initial purchase cost and associated storage and tracking costs. Jerry does some research to determine these costs and estimates the time saved by adopting each method. He presents his time-savings methods to the board at the next meeting and it votes on whether to adopt them. Then Jerry tracks the changes and how they affect actual customer response time to see how well his ideas work.

## Policies

Policies are documents created to clarify intent and describe how regular functions of the system are administered. They are used to protect the board from misunderstandings that might lead to unauthorized behavior or lawsuits. A written policy helps to ensure that everyone is treated equally by the board. Policies ensure consistency and help credibility.

The first part of each policy statement should be an overview, including why the policy was created. The second part should explain who the policy applies to, who has authority to determine whether the policy is being adhered to, and how and to whom appeals should be directed if there is a dispute. The last part of each policy gives details on what is required, who is exempt from the policy, how misunderstandings and deviations are to be handled, and how long the policy remains in effect.

There are three main categories of written policies that your board should have in place:

- personnel policies
- customer service policies
- billing and collection policies

Personnel policies are very important. They spell out exactly what are the roles and responsibilities of both the employee and the employers. If you as a board hire people, then it is an employer, and all employers should have personnel policies. If your board has never created personnel policies before, you should contact your state's Department of Labor. It can help you get started with templates for:

- job descriptions and requirements (see the appendices for examples), including operator classes
- compensation and pay periods
- benefits, including vacations, sick leave, insurance, and retirement funding
- training and educational assistance
- shift scheduling
- performance evaluation procedures
- hiring and firing procedures
- grievance procedures
- Equal Employment Opportunity Commission (EEOC) rules (see also the EEOC website at [www.eeoc.gov](http://www.eeoc.gov))
- safe and respectful work environment
- conflict of interest and ethics codes

Customer-service policies have an important role too. Have you ever heard one of your customers claim they were treated unfairly? If you have written policies in place, everybody should be treated the same, and you can point to the policies for justification. Customer-service policies should include:

- service rules and regulations
- rates and service fees
- water-demand management
- non-standard service requirements
- service agreements



Billing and collection policies include:

- routine billing and collection procedures
- late payment procedures
- cessation of service procedures (discontinuance, shutoff, non-payment)
- procedures for re-establishment of service
- procedures for new service connections

Other policies that could be useful to your board include:

- asset-management policies
- conflict of interest policies
- financial or accounting policies
- investment policies

Policies should be established only after considering the recommendations of staff and possibly consultants, studying the issues and needs of your customers, gathering facts, and discussing options. But policies are not static documents that are done once and then blindly adhered to. If situations change, it's okay to change policies as well. A review of policies should be an ongoing process. Instead of reviewing all the policies your board oversees at once, consider reviewing a few at each monthly meeting, with the goal of an annual review of each. Example policy statements can be found in Appendix G.

## Project Management

Replacement of equipment, upgrading or changing treatment, service for new residential or commercial developments—all of these things and more call for skills in project management. Project management means planning, organizing and obtaining resources and personnel to bring about the successful completion of specific objectives. Depending upon the size and complexity of your project, your board may be justified in hiring a

## Have a big project to manage? RCAP has help for managing large infrastructure-construction projects

RCAP has produced a companion to this guide—*Getting Your Project to Flow Smoothly: A Guide to Developing Water and Wastewater Infrastructure*—to

assist small communities in carrying out large infrastructure construction projects, such as constructing a drinking water treatment plant or installing a wastewater collection system.

The guide is comprehensive and detailed and walks project owners—boards of small systems—through all the steps of the planning, design and construction phases of a project. It discusses funding possibilities for each of the phases, hiring an engineer and many other matters to consider in the process. The guide helps owners avoid the common pitfalls seen in many community projects.

The guide is available from RCAP technical assistance providers in the field or as a PDF at [www.rcap.org/commpubs](http://www.rcap.org/commpubs)



consultant to carry out project management. Smaller projects may be handled by the board.

Project management requires organization, time management, and knowledge of the law.

Project-management activities can be grouped into the following steps:

1. initiating
2. planning
3. executing
4. monitoring and controlling
5. closing

A project is *initiated* when a need is discovered. For example, a wastewater pump starts to fail regularly, and despite the best efforts of your operator and the vendor to keep it running, it is finally determined that the pump needs to be replaced. So a project to replace the pump is initiated when the operator (or facility manager, if you have one) approaches the board to tell it a new pump is required. Initiation also includes figuring out who will do what in each of the following steps of project management.

*Planning* the project takes quite a bit of thought. This step should not be rushed. Going through the planning phase carefully and thoughtfully will save both time and money later. Integration of different department functions, costs, human-resource requirements (will you have to hire outside help for installation, or pay for overtime for existing personnel?), scope of the project, quality control (how will you know the pump is functioning according to the design?), communications, time, procurement procedures and risk management all must work together to produce the end result of a reliable pump installed in your facility.

Some of the considerations that must be addressed for the pump project are:

- Should the pump be replaced with the same

type, size, and manufacturer, or should a different type, size, or manufacturer be used? How will you decide which vendor is the best—cost, reliability, ease of repair, availability of parts, other?

- What bidding and procurement laws govern the purchase of a new pump for your particular situation? Do you have to accept the lowest bid, or is there a different method you are allowed to use? How will you pay for it?
- How long will the old pump last, and how long will it take to get a new pump installed? What will your system do if the old pump quits for good before the new one is ready?
- What training will your operators need for the new pump? Will the new pump be compatible with the other equipment in your facility?
- How will you communicate with your customers, the vendor, and your regulators while the pump is being installed? Will the installation cause sampling or effluent changes? What will you do if there are problems with the new pump?
- How long will each step in the project take?

As with any major undertaking, it's best to figure out the answers to the above questions (and many others you can probably think of for your specific project/situation) before the pump is purchased, rather than doing it as you go. Once the board agrees on the steps and timeline, a project plan can be finalized. Planning a project, even a relatively straightforward one, generally takes the longest time in project management.

After you've established a plan for replacing the pump, chosen the vendor and obtained funding for the project, it's time for *executing* the project by alerting the vendor to manufacture the pump, letting your stakeholders know the project has started, and making sure your operators are aware of who is allowed access to the site for

the project. Your board might want to think about investing in project-management software for this step. Software is handy for tracking the availability of people, materials and equipment that are essential for getting the project to completion. There are some project-management software packages freely available on the internet, and some cost less than \$100 per person to license.

You can see from the previous list of questions that some tasks need to be performed in a certain order while others can happen before, during or after the installation of the pump. This is where *monitoring and controlling* come in. It's important to know if the tasks associated with the project are being completed on time and within the budget for the project. And if the tasks are not being completed on time or are costing too much, you can spot that and find out why.

Once the pump has been installed, the operators trained and the vendor is paid, it's time to *close* the project. During this phase, you can depend on your project-management software to provide detailed summary reports of everything from missed timelines to the amount of money spent during the project and how that information matches up with the original project plan. The summary reports can help you assess progress as well as help streamline future project-management assignments. The *sign-off* is probably the single most important closing document. Getting sign-off on a closing document formalizes the end of the project. This doesn't mean changes or enhancements can't still be made, but if they didn't fall under the original project scope, those changes become their own project.

## Planning and preparing for emergencies

The saying goes that the time to fix the roof is not while it's raining. This saying couldn't apply

## TIP



Sticky notes are a really useful tool when planning. Each step can be written on a sticky note, and then the notes can be moved around to generate a timeline for the project.

more to water and wastewater systems. These systems are vital to a community's residents, and so being prepared for a natural or human-caused emergency is key to ensuring the continual quality of your service to your customers.

The Environmental Protection Agency has identified program that can help you develop an effective preparedness program for your system. The EPA uses the term "protective program" to encompass preparation for and responses to natural disasters (like hurricanes or earthquakes), malicious acts, accidents, and other incidents that would adversely affect the operation of your system. There are ten separate features of programs that are recognized as "active and effective," regardless of the size of the system.

1. Daily business operations should foster a protective culture throughout the organization to ensure continuity of your services. Make sure that operators and managers (if your system employs those) are encouraged to bring concerns or ideas for improvement to you or other board members.
2. Protective program priorities and resources should be identified and reviewed at least annually, supported with utility-specific measures and self-assessed using these measures to understand and document program progress.
3. Protocols for detection of contamination



should be used, while recognizing limitations in current contaminant detection, monitoring and public health surveillance methods.

4. Risks and **vulnerability assessments** should be reviewed annually by the board to reflect changes in potential threats, vulnerabilities and consequences. Detailed information on performing vulnerability assessments may be found in Appendix H.
5. Access should be restricted only to authorized individuals, and you should be able to detect unauthorized physical and cyber intrusions. Access controls can be physical (like fencing, lighting, locks or alarms) or procedural (requiring employees to wear identification badges).
6. Incorporate protective program considerations into procurement, repair, maintenance, and replacement of physical infrastructure decisions. Have a plan that includes alternate vendors, an adequate supply of replacement parts and treatment chemicals and emergency power backup.
7. Prepare **emergency response**, recovery, and **business continuity plans**; test and review plans, and regularly update plans annually or more frequently to ensure National Incident Management System (NIMS) compliance and to reflect changes in potential threats, vulnerabilities, consequences, physical infrastructure, utility operations, critical interdependencies and response protocols in partner organizations.
8. Forge reliable and collaborative partnerships with first responders, managers of critical interdependent infrastructure, other utilities and response organizations to maintain a resilient infrastructure.
9. Develop and implement strategies for regular, ongoing communication with employees,

customers and the general public to increase overall awareness and preparedness for response to an incident. This step may entail pre-written press releases, updates to your website, or other methods.

10. Monitor incidents and available threat-level information, and use protective procedures in response to relevant threats and incidents.

The short version of these ten features is: Know your system, be prepared for emergencies ahead of time, and know where to get help if you need it.

One place you can get help in an emergency is a WARN, which stands for Water/Wastewater Agency Response Network. A WARN will help you to prepare for emergencies that affect your system, organize your system's response to emergencies using established requirements, and share personnel and equipment statewide by written agreement. While this sounds much more formal than simply lending a helping hand, a WARN is designed to allocate resources efficiently and to protect your bottom line in terms of paying you for assistance you may give to another system.

If your closest neighbors in times of need are located across state lines, an **Emergency Management Assistance Compact (EMAC)** is the most reliable option. All 50 states participate in EMAC. Even if your system is not a public utility, your state may have mechanisms in place that will allow your participation in an EMAC.

There are eight basic elements of emergency-response plans:

- Know your system's information.
- Establish roles and responsibilities.
- Establish and use communications procedures.
- Make sure your personnel are as safe as possible.



- Identify alternative water sources.
- Plan for replacement equipment and chemical supplies.
- Protect your system's property.
- Perform water sampling and monitoring.

Under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, emergency-response plans are required for systems that serve more than 3,300 people. Some states require emergency-response plans no matter what size the system is, and some funders require them as a condition under their loan programs. Regardless of any regulatory or financing requirement, planning for an emergency is common sense for all water or wastewater systems, no matter what the size.

Once you have created an emergency-response plan for the different situations that your system may face, you need to evaluate it. Choose one weather-related emergency, and run a drill to see how well your plan works. It's preferable that the drill be performed with your workers using the **Incident Command System (ICS)**, activating your emergency communications chain and going out into the field to perform emergency shutdowns and re-starts of equipment. However, if this is not practicable, a tabletop drill should be done. If problems arise that you haven't foreseen, change the plan, run the drill again, and evaluate it once more.

More information on emergency-response planning can be found in the appendices.

## Recordkeeping

Documents that pertain to the origination and/or incorporation of the legal entity authorized to operate your water or wastewater system are *extremely* important. These documents must be kept in the system's permanent records. They

form the legal basis for the system's existence and detail the conditions under which the system must operate. They should be kept in a safe place and reviewed by the board periodically. These documents include:

- articles of incorporation
- petitions to courts, court orders, resolutions and judgments
- bylaws
- certificates of operating authority
- certificates of public convenience and necessity
- public-trust **indentures** or agreements
- local ordinances and acts
- state or local enabling legislation
- municipal charter
- agreements with other entities or agencies

Other financial and legal records to be kept permanently include:

- audit reports
- capital stock and bonds records
- cancelled checks for important purchases (property or special contracts)
- contracts, mortgages, notes and leases
- grant and loan agreements from state and federal funders
- correspondence concerning legal and important matters
- depreciation schedules
- year-end financial statements
- insurance records, accident reports, claims and policies
- minutes of board meetings



- tax returns and other documents relating to the determination of tax liability
- rights of way and easements
- trademark registrations and copyrights

Other important records have various retention times dictated by federal regulations, from six months to more than 30 years. Records on **asset** purchases ranging from land and buildings to equipment should be kept for the life of the asset or until six years after asset is disposed of in order to satisfy taxation requirements on recordkeeping. Personnel records should be kept for an additional three years beyond when an individual is employed. If a worker is injured on the job, then his or her personnel records should be kept for 30 years. Laboratory testing data should be kept for ten years. State Revolving Fund records should be kept for 20 years after the funding has been received.

Examples of records to keep for seven years are:

- accident claims and reports that have been settled
- cancelled checks (except for those listed in “permanent records”)
- donations
- expired contracts and leases
- invoices from vendors to the system
- payroll records and summaries
- cancelled stock and bond certificates
- subsidiary ledgers
- withholding tax statements

The following records should be retained for at least three years:

- bank statements
- internal audit reports
- bank reconciliations

- employment applications
- miscellaneous internal reports
- general correspondence

And keep correspondence with customers and vendors for at least two years.

Your state or tribe may have its own guidance on retaining records that differs from federal regulations. A good rule of thumb is: Before destroying any financial records, contact your system’s accountant, and before destroying any legal records, contact your system’s attorney.

## Communications

Water treatment, distribution and wastewater collection and treatment are vital community services. But do your customers value the community’s water and wastewater systems? Developing a sense of value within your community is not something that happens overnight. It is the result of not only providing effective, reliable service, but also effective, ongoing communications. Once you have your community’s support and approval, it’s easier to get support for new projects and rate increases. With customers on your side, they will trust your system in times of crisis or disaster, and negative news doesn’t affect the system’s reputation as severely.

When your board is establishing a communications strategy, it should begin with the end in mind. Think about the system’s goals and objectives, and consider what the public wants from its water and wastewater systems. To gain public confidence in your system, you must show that:



## TIP

Proactive communication is far better than reactive confusion.

- your treatment meets or exceeds all standards
- your service is reliable
- your employees are qualified, knowledgeable, competent, friendly and polite
- the board of directors operates the system in a responsible manner
- their bills are accurate and equitable
- your system is trustworthy

Appoint a spokesperson for your system to avoid conflicting messages coming from different individuals. The spokesperson should have excellent speaking and writing skills and be friendly, knowledgeable, professional and trustworthy. He or she should obviously not be afraid of speaking in public, appearing on camera, or speaking to the media. This person is representing your system, and it's your system's credibility and image at stake. You want the best person you can find. If a board or staff member does not fit the above criteria, perhaps you could look for a volunteer spokesperson within community civic groups or churches.

Your spokesperson will have different communication styles for different audiences. Imagine what target audience your spokesperson will be addressing:

- decision makers, such as the health department, regulatory agency representatives or government officials
- the media (newspapers, TV, radio); informal or social media, such as customers who blog or post to listservs, produce community newsletters or post to their Facebook pages
- customers
- internal audiences, such as board members or system employees

Then think about what the audience has on its mind. Are they worried due to a natural disaster? Are they angry because of a rate hike?

Perhaps the audience just wants information or to be reminded that they can trust their system. Although brand-awareness campaigns or messages may not seem to produce any tangible or immediate results, they are still helpful and serve a certain purpose.

It is worth taking the time to write some scripts (also put in the form of a written news release) for different scenarios, so that the spokesperson doesn't have to improvise under pressure. Events like water main breaks or construction activities, or even natural disasters that happen fairly regularly (like flooding or power outages) can be described in a script ahead of time. Leave blanks in the text for the type of problem, the area affected by the problem, and how the public will be affected. The spokesperson can fill in these blanks when the event occurs.

Your system's website and social media, including Facebook, Twitter and others, are very effective ways of getting your message out. Ensure you have adequate cyber security in place to help prevent your utility's information systems from getting hacked. Other security tips include requiring strong passwords (at least six characters long, including a number, symbol and one capital letter) that are unique for each social media website, not linking social media accounts together, denying use of all applications offered, learning what sensitive system data is and not posting it, not identifying workers by name, not "friending" people who aren't identifiable customers, not chatting and not answering surveys that pop up. Finally, remember that whatever you post on a social media outlet could be online forever. People can save pages or cut and paste any type of post made and redistribute it very easily.

Crisis communication is a special type of communication and should be considered very carefully. It may seem that the best course to take

in a crisis is to remain silent. This is not always the case. It is very easy for rumors to fly among customers, and people's minds often gravitate to the worst-case scenario in a situation. A rule of thumb to remember is that just because you release information does not mean you will lose control of the situation. In fact, becoming an authority in a crisis and taking charge with the information will actually give you a degree of control of the situation with the public. In some cases, but not all, being honest and upfront with information, such as admitting wrong-doing and apologizing, is the best course of action and a way to get through a crisis more quickly. If this is done quickly, be sure to then take command of a situation and communicate how you are correcting a problem.

**Consumer confidence reports** (CCRs) are a part of communications that are driven by law. The Safe Drinking Water Act Amendments of 1996 require that water systems send out CCRs annually, no matter what population they serve. CCRs must contain the following components:

- information on the water source
- a list of all contaminants that the system tests for
- a list of the maximum, minimum and average results of the contaminant tests
- any violations of contaminant levels
- the health effects of the contaminants
- definitions of terms (like MCL, mg/L, TT, or any others that an average person wouldn't be familiar with)

The CCR can also contain information on upgrades, new projects, the goals of the water system, and other items that can strengthen relations with the community. Because your system is required by law to create a CCR anyway, you might as well make it work as a

public relations tool for your system.

An example of a CCR may be found in Appendix I.

## Limiting Board Liability

As the governing body for your utility, there is potential liability for actions you take as a board member, as well as actions taken by others (that is, staff), on behalf of the utility. Historically, public officials from municipalities and districts have not been held personally liable for good-faith acts performed within the scope of their duties as directors. However, a board member may be liable for any act or action that is beyond his/her authority, that is performed in bad faith or malice, that involves intentional misconduct, or is a known violation of the law. There is no way to completely shield you or other board members from lawsuits. However, there are actions that you can take to minimize risk. These include:

**Insurance:** The utility should maintain a directors and officers policy to cover the actions of the board. In addition, it is advisable to obtain a general or professional liability policy for the utility to cover other acts or omissions that might be attributable to the utility generally or its staff.

**Attend meetings:** How can you be sure that your utility is operating correctly unless you attend meetings and actively participate in the discussions and decisions being made? It is possible that you could be responsible for actions taken by the board, even if you were not present when decisions were made. Make a point to attend all board meetings and do your part to exercise good judgment in making decisions on behalf of the utility. If you need the advice of experts (attorney, engineer, technical assistance provider), a board meeting is the best time to present this help so that all board members can benefit from their expertise. Ensure that accurate minutes are kept for every board (and committee) meeting. You



should review these minutes for accuracy and, if necessary, register in writing any disagreement you might have with their adoption. The minutes are an important legal record of the utility and should be treated as such. Also, require your manager and/or operator and/or bookkeeper to provide written reports on their activities during the preceding month. Review these reports, ask questions, and ensure that you understand the current financial and operational status of your utility.

### **Know your policies and governing**

**documents:** Board members must be aware of both their governance documents and the policies adopted for the actual operation of the utility. The failure to adopt policies where policies are needed, the failure to abide by adopted policies and/or the failure to apply policies consistently can lead to appeals to state regulatory authorities or even litigation. Review your policies every year and ensure that they stay current with ever-changing state rules and regulations.

**Avoid conflicts of interest:** While systems are covered by statutory requirements regarding conflicts of interest, it is a good policy to adopt a separate conflict of interest policy. Having and abiding by a reasonable conflict of interest policy assures your customers that you are acting in the public's interest and not for any personal financial gain.

**Advice from experts:** Ensure that you are getting the expert advice you need from attorneys, accountants, engineers, regulatory agencies and technical assistance providers. You are not expected to know everything about the operation and management of your utility, so use these professionals to provide guidance and support where needed. However, do not let these experts make the decisions for you. You must consider their advice, then, based upon your own experience, the collective expertise and experience of the board, and most importantly, a healthy dose of common sense, decide what is best for the utility.

**Abide by legal requirements:** Not only must you ensure that you comply with state primacy agency and EPA regulations, you must also comply with other rules, such as IRS rules (for example, withholding taxes and operation of the utility in compliance with your nonprofit status) and Department of Labor requirements, especially involving employee safety.

**Financial management:** This can be a board's greatest potential liability. For example, failing to maintain financial controls, wasting system assets, and misrepresenting financial conditions are all ways of neglecting your financial responsibilities as a board member.

# GOOD BOARD MEMBERS: DOs & DON'Ts

## GOOD BOARD MEMBERS DO:

1. Recognize that their responsibility is not to directly manage or operate the system, but to ensure that it is being well-managed and -operated.
2. Work through properly adopted administrative procedures.
3. Function as part of a policy-making and control group rather than as part of an administrative board.
4. Understand the mission of the organization and keep their activities directed at fulfilling that mission.
5. Familiarize themselves in a broad and non-technical manner with problems and issues confronting the system.
6. Attend all board meetings or show a valid reason for any absence.
7. Voice opinions frankly in board meetings and vote for what seems best for the organization as a whole.
8. Recognize that the organization's manager is responsible for carrying out board policies and directives in accordance with applicable state and federal regulations.
9. Frame policies and plans only after considering the recommendations of pertinent employees and consultants (manager, operator, accountant, lawyer, engineer, etc., as appropriate) together with the reasons for such recommendations.
10. Require regular oral and written reports to keep themselves properly informed on matters of importance to the organization.
11. Give authority which is commensurate with responsibilities.
12. Wherever possible, maintain harmonious relations with other board members when such relations are consistent with their obligations as individual members of the board.
13. Establish written criteria for evaluating employees.
14. Support and protect other board members and employees in the performance of their official duties.
15. Give friendly counsel and advice to employees.
16. Understand their legal and ethical responsibilities as board members.
17. Plan ahead to meet future growth demands and other system needs.
18. Seek to promote a positive image of the system among its customers.
19. Treat all customers fairly and equally when complaints and problems are brought to the board's attention.
20. Attend regular training sessions concerning the duties and responsibilities of their system and their role as a member of the board.
21. Refrain from any activity that would result in a monetary profit, unless such activity is expressly provided for in the system's regulations, bylaws or policies (such as reimbursement for training).

## GOOD BOARD MEMBERS DO NOT:

1. Interfere with the day-to-day routine of operating, managing and administering the system.
2. Refuse to support worthwhile programs, other board members or employees because of personal conflicts.
3. Make promises and commitments before the questions and issues are fully discussed at board meetings.
4. Form or join a clique to control board actions.
5. Use board membership for political or business advancement.
6. Indulge in petty criticism of the administration (that is, employees).
7. Divulge confidential information.
8. Assume undelegated authority in matters when the board is not in session.
9. Accept gifts from suppliers or contractors.
10. Use their positions to obtain favorable treatment from the system.
11. Ask the manager or employees to violate or ignore any regulatory requirement.

# Financial Duties and Responsibilities

If you have not worked with financial documents before or don't regularly work with a financial mindset, one of your most difficult duties as a board member may be understanding your financial responsibilities. Budgeting, audits, finding funding, raising rates, and keeping financial records are all a part of being a board member for a small water system.

You already know how central financial resources are to the operation of any business or enterprise that provides a product or service. Your enterprise can sink or swim based on its financial standing. You also know how essential drinking water and wastewater treatment is not only to a city or a community, but to even a single household. So in addition to the responsibilities you were elected to take on in overseeing the financial management of your utility, you probably understand that you have a deeper obligation to ensure that your utility's finances are managed properly because they are the main resources that support the continual provision of essential water-related services where you live.

Every board member should understand how to budget, how to read financial statements, what funding sources are available, and how to adjust rates. The more members who know what is going on financially in the utility, the better able they are to check each other and to plan for the future. Remember: Whether your system is a not-for-profit, municipality, district, manufactured home park, etc., it is supposed to run like a business. This means that the full costs of providing service should be shared by the customers.

As a board member of a small water or wastewater system, your aim is to make your system sustainable. **Sustainability** is your system's ability to provide safe, high-quality drinking water or waste-disposal systems to your customers while meeting your regulatory responsibilities. If your system is **financially sustainable**, it means that your system provides water or wastewater-treatment services to your customers at a rate that consistently generates enough revenue to meet all of your expenses, both in the short- and long-term. The trick is being financially sustainable while providing services at an affordable and fair cost.

## Budgeting

Planning and budgeting are essential functions of any board of a water or wastewater treatment facility. Budgets are plans using dollar values. Your board should prepare an annual budget. In fact, many lenders require the submission of an annual budget and cash-flow projections for each fiscal year. Projected planning budgets, or budgets that predict future revenues and expenses, can be developed for any time period: three years, five years, ten years, or whatever span of time makes the most sense to your board. Budgets provide the following information:

- what is planned
- what it is expected to cost
- source and amount of revenues
- the expected financial position of the water or wastewater facility

Budgeting should be a team activity. The budget for the previous year should be reviewed and analyzed prior to generating a new budget. To budget effectively, you should understand the amounts



and the reasons for each expenditure from the previous year, the needs of your system, including any substantive changes since last year, and how to prioritize projected needs given available revenues.

Think about how an increase or decrease in your service area would affect your system's financial stability. Factor into your thinking economic trends and employment levels in your service area. Examine trends related to the cost of materials and services. Consider whether your system should focus on paying off debt or on expansion and upgrading treatment or both. Take into account costs that cannot be controlled, and minimize expenses as much as possible. For instance, petroleum costs might be fluctuating. That's a cost you can't control. But using plastic pipe, which is manufactured using petroleum, for replacement or repair might be purchased when the cost of petroleum is down. That's a cost you can control.

Five main financial areas should be examined when generating a new budget:

- loan payments and debt-service reserve required by your lenders
- financial reserves required by your system
- the full cost of operating your system
- system revenue from water sales or wastewater treatment
- adjusting your revenue to cover your anticipated expenses

Debt-service reserve is money required by lenders (and sometimes mandated by state statute) in addition to the principal and interest. This reserve ensures that you can make your loan payments on time even if an emergency occurs. Frequently, the level of this reserve will be set at one year's principal and interest payments. Most lenders forbid withdrawals or transfers from a debt-service reserve account without prior approval by the lenders. So debt-service reserve is known as a "restricted" cash asset.

Equipment wears out or breaks, treatment requirements change, and emergencies happen. For these reasons, your system should have system financial reserves. These reserves can be placed in an interest-bearing account and are cash assets. Work with your operator to determine the lifespan of the equipment in your facilities and the costs of repairing it. Review what emergencies took place during the past two years and the costs associated with resolving the emergencies. Estimate the cost of future upgrades and expansion that the board has committed to, and decide how much of that cost will be paid for out of the reserves and how much will be financed. An example worksheet for calculating system financial reserves may be found on page 38.

**Full-cost pricing** means that your rates reflect the true cost of producing and selling water or of treating and disposing wastewater, including all operating expenses, debt service, and funding reserve accounts for equipment replacement and future improvements and expansions. How do you determine whether your system's rates reflect full-cost pricing? The financial statements produced by your bookkeeping staff or accountant can help you determine if your rates will cover the full cost of providing service. Financial statements and how to read them are covered in the following sections.

## Financial Statements

There are three major financial statements that all business operations should produce:

- The *balance sheet* shows how much your system is worth at a point in time.
- The *income statement* shows how much revenue the system has earned versus the amount of expense it has incurred.
- The *cash-flow statement* breaks down all of the financial transactions of the system in terms of how they affected cash.



## FINANCIAL RESERVES WORKSHEET

### PLANNED EQUIPMENT REPAIRS AND MAINTENANCE

Annual budget amount = replacement cost of equipment/years of remaining life

Major equipment	Replacement cost	Years of remaining life	Annual budget
1.	\$		\$
2.	\$		\$
3.	\$		\$
<b>TOTAL:</b>			\$

### EMERGENCY REPAIRS

Potential emergency	Annual budget
1.	\$
2.	\$
3.	\$
<b>TOTAL:</b>	\$

### PLANNED SYSTEM EXPANSION OR IMPROVEMENTS

Annual budget amount = self-financed amount/years until start of project

Capital projects	Self-financed amount	Years until start of project	Annual budget
1.	\$		\$
2.	\$		\$
3.	\$		\$
<b>TOTAL:</b>			\$

## FINANCIAL BASICS EXPLAINED

The detailed explanations of balance sheets, income statements and cash-flow statements in this section are taken directly from another guidebook published by the Rural Community Assistance Partnership (RCAP)—*The Basics of Financial Management for Small-community Utilities*. This primer on financial management and its tools is another guide, like this one, that is an ideal orientation for new board members or background for experienced board members on this topic.

*The Basics* guide covers these key parts of financial reports and a lot more. It discusses the importance of solid, effective financial

management of a utility—developing a system that is financially sustainable.

The guide is available in print from RCAP staff in the field or as PDF, which you can view and print yourself on your own computer at [www.rcap.org/commpubs](http://www.rcap.org/commpubs).

There are also multimedia supplements to the guide that can be accessed through the URL above.



# The Balance Sheet

The **balance sheet** has three components:

- **assets**
- **liabilities**
- **equity**

The heading of the balance sheet includes the date—the point in time for which the balance sheet is relevant. The heading of Table 1: Sample Balance Sheet, below, shows the date December 31, 2010, and compares the numbers for 2010 to those of the previous year.

## TABLE 1: SAMPLE BALANCE SHEET

DECEMBER 31, 2010

ASSETS	2010	2009
<b>CURRENT ASSETS</b>		
Cash & cash equivalents	496,474	253,573
Accounts receivable	60,026	65,040
Prepaid expenses	4,982	4,957
Short-term investments	2,219	0
Inventory	14,248	15,302
Total Current Assets	\$577,949	\$338,872
<b>FIXED ASSETS</b>		
Land	6,950	6,950
Property, plant & equipment at cost	2,915,599	2,915,599
Less accumulated depreciation	-1,636,060	-1,523,462
Total Inventory	1,286,489	1,399,087
<b>LONG-TERM ASSETS</b>		
Investments	86,660	186,660
Total Long-term Assets	86,660	186,660
<b>TOTAL ASSETS</b>	<b>\$1,951,098</b>	<b>\$1,924,619</b>
<b>LIABILITIES AND NET ASSETS</b>		
<b>CURRENT LIABILITIES</b>		
Accounts payable	8,452	7,987
Current portion of long-term debt	56,123	54,238
Withheld & accrued payroll taxes	3,158	3,479
Accrued interest	13,335	0
Meter deposits	43,504	44,602
Other accruals	1,425	1,335
Total Current Liabilities	125,997	111,641
<b>LONG-TERM LIABILITIES</b>		
Long-term notes payable	1,297,938	1,354,061
Total Long-Term Liabilities	1,297,938	1,354,061
<b>EQUITY</b>		
Contributed capital (membership)	56,415	56,415
Donated capital (govt. grants)	1,720,300	1,720,300
Retained earnings	-1,249,552	-1,317,798
Total Equity	527,163	458,917
<b>TOTAL LIABILITIES &amp; NET ASSETS</b>	<b>\$1,951,098</b>	<b>\$1,924,619</b>



It is called a “balance sheet” because the numbers on the sheet must be in balance. This means the total assets must equal the total liabilities and equity:

$$\text{liabilities} + \text{equity} = \text{total assets}$$

What if the liabilities of your utility are more than its assets? In that case, your system has what is called “**deficit equity**.” Deficit equity occurs when the system has incurred more in net losses over the life of the system than net income. Deficit equity will typically be noted by parentheses around the numbers in the equity section of the balance sheet. Particular care should be taken when reviewing the balance sheet of a system with deficit equity. Questions should be asked to determine how the system got into a deficit position, and a plan should be formulated for moving the system back to a stable, or “positive-equity,” position.

## Assets

Assets are the total economic resources of a system that are expected to provide benefits to the system in the future. Assets are normally listed in **liquidity** order, which means they are listed based on how easy they are to convert to cash. So naturally, the first item listed will be cash and cash equivalents. The assets section is also broken down into:

- current assets
- long-term assets
- property, plant and equipment

### Current Assets

Current assets are items that can be converted into cash within one year of the date of the balance sheet. Current assets include cash and cash equivalents, accounts receivable, inventories, short-term investments and prepaid assets.

**Cash and cash equivalents** include the amount of money currently available in the system’s demand accounts. Cash equivalents include any security that has a maturity date of less than 90 days. The sample balance sheet includes a certificate of deposit in the cash and cash equivalents line that will mature on February 28, 2011, less than 90 days from the balance sheet’s statement date of December 31, 2010.

**Accounts receivable** is money owed to the system. This includes things like outstanding water bills, connection fees owed to the system, and reconnection fees.

**Prepaid expenses** are expenses paid in advance; for example, an insurance policy that is purchased, and its annual premium is paid up front. The value of the insurance premium will be recorded as a prepaid asset until the premium is used. In the balance sheet example, prepaids of \$4,982 are listed, which is the result of a property insurance premium paid on December 15, 2010. The insurance policy is effective from January 1, 2011, through December 31, 2011. Because the system will receive the benefit of this policy during the next **fiscal year** (2011), the amount paid is considered an asset on the effective date of the example balance sheet—December 31, 2010.

**Short-term investments** include investments with maturities more than 90 days from the balance sheet’s date but less than one year from the balance sheet’s date. On the sample balance sheet, the short-term investments include certificates of deposit with maturity dates of July 8, 2011, and December 26, 2011.

**Inventory** includes the value of products related to the business that are, or will become, available for use or sale within the next year, such as new meters, pipe, equipment, and replacement parts.

## Fixed Assets

**Fixed assets** are the land, buildings, furniture and fixtures that the system owns and uses in day-to-day operations. On the sample balance sheet, fixed assets are broken down to show the value of each category. The amount of accumulated **depreciation** is then subtracted to “net down” to the book value of the assets. Some systems may choose to show only the book value of the assets on their financial statements. Both presentations are acceptable.

What does depreciation mean in terms of fixed assets? Over time, the value of fixed assets is “used up,” and you must account for the decrease in value of these assets from the normal wear and tear due to age and typical use. This is done by recording depreciation.

There are several methods for calculating depreciation. Under all methods, the system's managers must determine the lifespan of the asset, or how long they expect to be able to use the asset.

The easiest method of calculating depreciation is the straight-line method. For example, the normal lifespan of a building is 30 years. If a building initially costs \$100,000 and has a life of 30 years, it will depreciate \$3,333 (\$100,000/30 years) per year. The building will “use up” \$3,333 in value each year; so this year it is worth \$3,333 less than last year, and next year it will be worth \$3,333 less than this year, and so on. The amount of what is used up is tracked and added together in the accumulated depreciation account.

The accumulated depreciation is separated from the original cost in order to see what was paid originally for the asset and how much of the asset has been used up. The net value of the asset (or book value) provides the utility's management a current estimate of the value of the plant, property or equipment. Land value does not depreciate.

## Long-term Assets

Long-term assets include items that cannot be converted to cash within one year of the date of the balance sheet. Common examples of long-term assets include investments with maturity dates more than one year. In the sample balance sheet, the utility has a certificate of deposit with a maturity date of January 2, 2012 – two days longer than one year.

## Total Assets

Adding current assets to fixed assets and long-term assets provides the **total assets**.

$\text{current assets} + \text{fixed assets} + \text{long-term assets} = \text{total assets}$

The next step is to determine your system's **liabilities** and **equity (net assets)**, or what your system owes and what it is worth.

## Liabilities

**Liabilities** are what your system owes to others. The liabilities section of a balance sheet is divided into two components—current liabilities and long-term liabilities.

## Current Liabilities

**Current liabilities** include current maturities of long-term debt, accounts payable, accrued liabilities, and other short-term notes to be paid. Long-term liabilities are loans expected to be paid back over several years.

On the sample balance sheet, the current liabilities are broken down into:

**Accounts payable:** what the system owes for the normal operations of business, such as utility (electricity, etc.) bills, office supplies, and reimbursement to employees for travel expenses.



**Current portion (maturities) of long-term debt:**

This refers to the principal amount the system will be required to repay on long-term loans during the next twelve months. This figure does not equal the total payment amount, as that includes both the interest and the principal. The current maturities line item records only the principal that is being repaid. This amount can be obtained by reviewing the payment schedule of each outstanding loan and adding up the principal portion of each monthly payment for the next twelve months.

**Accrued liabilities** are basically the same as accounts payable, in that they represent what your system owes to others. However, the difference between accrued liabilities and accounts payable relates more to whom the amounts are owed. Accounts payable usually refers to items the system has purchased in the normal course of operations to support the ongoing activities of the system. Accrued liabilities are typically items that would be owed to employees, such as salaries, unpaid vacation/sick time, and payroll taxes withheld from employees' checks but not yet remitted to the taxing agency. Accrued liabilities also include security or meter deposits from customers (these are considered liabilities because the expectation is that the system will have to return them to the customer).

**Accrued interest** is the interest that has been incurred but not paid. For example, many systems have long-term loans or bonds that require only annual or semi-annual payments. Even though the system has not paid interest during the months between payments, it still has incurred the interest and owes it to the lender. The system will be required to pay this incurred interest with the next regular payment. The system should record the interest as it is incurred on its balance sheet as an accrued, current liability.

## Long-term Liabilities

**Long-term liabilities** include investments and the portion of payments to be made over the next several years that are not included in the current liabilities. For example, if you took out a capital-improvements loan that you were scheduled to pay back over the next five years, the principal amount to be repaid within the next year would be recorded in current liabilities, and the remaining principal scheduled to be paid back in years 2 through 5 would be listed as a long-term liability.

## Equity

The final section of the sample balance sheet covers equity (or net assets). Depending on the legal structure of your system (for-profit vs. governmental unit vs. nonprofit), this section will have various names. Other names include: net assets, fund balance, or owner's equity.

**Equity** is the net value of the system over time. Equity is what would be left if the utility closed its doors, paid off all of its outstanding bills, collected everything that it was owed, and sold all of its assets for exactly the same prices as they were recorded in the financial statements. The system increases its equity each year it earns a net income—or has more revenue than expenses. In turn, a system decreases its equity each year it incurs a net loss—or has more expenses than revenue. Equity increases are easiest to see using the income statement, which is examined later.

Looking at the sample balance sheet, you will see that if the system ceased operations on December 31, 2010, paid its outstanding liabilities, collected the accounts receivable, and sold the inventory and fixed assets for the amounts listed in the financial statement, it would have cash in the bank of \$527,163.

Equity increases for each year that a net income is recorded.



## Reviewing the Balance Sheet

Now that you know the components of the balance sheet, it is time to put this knowledge to use.

### First, look for changes

Look for significant changes from one year to the next on a comparative statement. It is important to know why changes are taking place so that you will know if corrections need to be made immediately to keep the system in the black.

Questions to ask include:

- Why did the value of fixed assets increase or decrease?
- Was new equipment purchased and installed?
- Was equipment sold or otherwise disposed of?
- Why did account receivables rise or drop dramatically?
- Was there a breakdown in bill collections or an increase in efforts to collect outstanding bills?
- Were new customers added, or were large water consumers lost?

### Second, calculate important ratios

Calculating a few common ratios can also provide a better picture of the system's overall financial health. The two most important are **liquidity ratios** and **leverage ratios**.

#### **Liquidity Ratio or Current Ratio**

The liquidity ratio (or **current ratio**) measures a system's ability to pay off current liabilities. Systems with less than a 1.5 liquidity ratio are considered to be in financial distress. To calculate the liquidity ratio, simply divide the balance sheet's current assets by the current liabilities:

$$\text{current assets} \div \text{current liabilities} = \text{liquidity ratio}$$

On the sample balance sheet (for 2010):

- Current assets: \$577,949
- Current liabilities: \$125,997

Using the formula above to calculate, you will arrive at a liquidity ratio of 4.59:

$$\$577,949 \div \$125,997 = 4.59$$

Judging from this liquidity ratio, the sample rural water system is in safe financial waters.

#### **Leverage Ratio**

The leverage ratio measures how much the system relies on debt. A leverage ratio below 0.30 indicates that the system may be in financial distress. The leverage ratio is determined by dividing the equity by total assets:

$$\text{equity} \div \text{total assets} = \text{leverage ratio}$$

On the sample balance sheet (for 2010):

- Total equity: \$527,163
- Total assets: \$1,951,098:

Using the formula above to calculate, you will arrive at a leverage ratio of 0.27:

$$\$527,163 \div \$1,951,098 = 0.27$$

The utility has a heavy debt load compared to actual value, which means that this system could be considered to be in financial distress. Keep in mind, however, that these ratios are only indicators. They should be used as tools to help guide the review of financial statements and not as anything absolute. One ratio alone will not determine the financial health of a system. These and other ratios should be considered together.

Throughout the remainder of this section you will learn to use different tools and to look at all of the numbers and ratios available to you in order to develop a true understanding of your utility's financial health.



## The Income Statement

The balance sheet provides a good snapshot of where the system stands at a particular point in time. But what about over a longer period of time? Are budget goals being met? Is equity growing or shrinking?

The best way to answer these questions is with the **income statement**. Sometimes referred to as the statement of activities, the income statement shows the results of operations over a specific period of time, much like a scoreboard does during a single football game. Just as you clear the scoreboard at the end of the game, the income statement starts over at the end of a set time period, such as at the end of a fiscal year.

The income statement shows how much revenue a water system has earned and how much expense it has incurred during the specified period. Income and expenses are broken down by type to provide a better understanding of how the system generates revenue and how it spends it.

Generally, the income statement tracks revenue and expense on a 12-month basis. This period is called the system's **fiscal year**. For the example utility used in this section, the fiscal year coincides with the calendar year—January 1 through December 31. Some systems may have fiscal years that begin at a different point during the calendar year, such as July or October. At the end of the fiscal year, all revenues and expenses incurred during that year are moved to the equity section of the balance sheet.

### Reading the Income Statement

To understand the income statement, the best place to start is at the very top. Look at Table 2: Sample Income Statement on page 45. The heading provides valuable information, including

the name of the system and the time period covered by the statement.

A heading that reads, for example, “for the month ending June 30, 2010” means the statement shows revenue and expenses incurred during June 2010 only. A heading that reads, for example, “for the quarter ending June 30, 2010” indicates that the document covers revenue and expenses incurred from April 1 to June 30 of 2010. A heading that reads, “for the year ending June 30, 2010,” would cover the entire fiscal year, which in this case takes place from July 1, 2009, to June 30, 2010.

The time frame indicated in a statement's heading is important because it lets you know when the revenue listed has been earned and when the expenses have been incurred. It is important to stress earned and incurred because the system may not have collected or paid the cash as of the date of the income statement, but it is entitled to the revenue and is obligated to pay the expenses. It is common to have a time difference between the date you record the financial information and the date you actually collect the money or pay the expense.

Revenue recorded on the income statement may not correspond exactly to deposits made to the system's bank account, nor will expenses tie directly to checks written by the system. Those deposits may be made or checks may be written after the period listed on the income statement, but the obligation to make those deposits or write those checks takes place during that period, and therefore must be logged.

### Accrual Accounting

Most utilities record financial activities on the **accrual basis of accounting**. Under this type of accounting, the system must record revenue when it is earned or when the system is entitled to the



## TABLE 2: SAMPLE INCOME STATEMENT

FOR YEARS ENDING DEC. 31, 2010 AND DEC. 31, 2009

REVENUE	2010	2009
Water Sales	661,363	665,091
Misc. Construction & Meter Conn.	19,293	10,831
Membership Fees Received	1,200	1,305
Total Revenue	\$681,856	\$677,227
OPERATING EXPENSES		
Salaries & Fringe Benefits	180,381	153,700
Depreciation Expense	112,598	118,338
Service Supplies	61,460	70,555
Electricity & Utilities	45,647	40,634
Insurance	40,786	33,702
Contract Labor	35,545	29,484
System Repair & Maintenance	24,816	19,498
Taxes & Licenses	16,696	17,482
Fuel & Oil	13,408	11,990
Telephone	9,701	7,761
Bad-debt Expense	6,646	2,663
Legal & Accounting	4,829	5,585
Miscellaneous	4,385	4,294
Postage	4,374	4,659
Office Expenses	3,320	3,699
Continuing Education	2,913	3,603
Uniforms	2,841	3,226
Testing & Analysis	2,662	2,941
Truck Expense	2,094	4,452
Bank Charges	132	90
	\$575,234	\$538,356
NET OPERATING INCOME (LOSS)	\$106,622	\$138,871
OTHER INCOME & EXPENSES		
Interest Income	20,000	12,230
Gain on Sale of Equipment	13,295	0
Interest Expenses	-71,671	-75,113
Total Other Income & Expenses	-38,376	-62,883
NET INCOME (LOSS)	\$68,246	\$75,988

money. It also must record expenses when they are incurred or when the system is legally obligated to pay the debt. It doesn't matter when the system actually collects the money or pays the cash.

An example: A water system prepares water bills for customers' water usage in May on the last day of that month and puts those bills in the mail. The system records a **receivable** at that time for

what customers owe for May water usage, even though the money won't actually be received until around the due dates in mid-June. This increases receivables on the balance sheet and increases revenue from water sales on the income statement. The same is true of expenses. If the system receives a bill on May 31, it is recorded then, even though the bill may not be paid until sometime in June.



## Understanding Details

Now that you know the basic function of, and information found on, an income statement, you will more easily understand how to review each section. There are three basic elements of an income statement: revenue, operating expenses, and net operating income (or loss).

- **Revenue** is income that has been earned by the system. Examples include water sales to customers, late charges, and service charges.
- **Operating expenses** are incurred during the system's normal operation. This can include salaries, fringe benefits for employees, utility bills, insurance, and water purchased for resale.
- **Net operating income (or loss)** is determined by subtracting operating expenses from revenue. If the system has more revenue than expenses, it is operating with a net income. If operating expenses are greater, the system is operating with a net loss. This is a very important number because you want to make sure your system is charging enough to cover the full cost of providing water.
- Other income and expenses is the category where you list interest income, interest expense, and any gains or losses on sales of equipment. It also will show items that are unusual in nature, such as things not related to the operation of the system. Unusual items are hard to define, but as the saying goes, "You'll know them when you see them." They are sometimes items that do not occur on a monthly basis, such as regulatory expenses, consultants (an engineer), or fines. Be careful about putting items in this category, however.
- **Final net income (or loss)** is the last line on the statement. To determine the overall net income, add the net operating income to other income and expenses (or subtract if it's a loss). This gives you the final net income (or loss)

for the period listed on the income statement, such as the fiscal year.

$\text{net operating income} + \text{other income and expenses} = \text{net income for statement period}$

or

$\text{other income and expenses} - \text{negative operating income} = \text{net income for statement period}$

The income statement in Table 2 is a comparative income statement because it shows figures for both 2009 and 2010. Comparative income statements provide an idea of how the system is progressing: Are revenues up or down? Do the revenue changes make sense? Why are water sales way up over the same period last year? Are there more customers, or did the system implement a rate increase? Is revenue down, if so, why? Are expenses up or down? If so, again, why?

Any changes from one year to the next should make sense to you. Don't be afraid to question employees, such as the operator, bookkeeper, accountant, or the utility's auditor, until the answers make sense and until you receive an explanation you can understand.

## Calculating Income-Statement Ratios

In the balance sheet section of this guide, we learned how to calculate the liquidity and leverage ratios to check the system's fiscal health. Calculating ratios from the income statement is also an effective way to check the overall fiscal health of a system. The two most important ratios to calculate on the income statement are the operating ratio and the debt-service ratio.

### Operating Ratio

The **operating ratio** is a simple calculation used to measure the profitability of a system. Normally,



a water utility that has an operating ratio of less than 1.0 is considered financially distressed. The formula for calculating the operating ratio is:

$$\frac{\text{operating revenues}}{\text{operating expenses}} = \text{operating ratio}$$

On the sample income statement (for 2010):

- Total revenue: \$681,856
- Total operating expenses: \$575,234

Using the formula above to calculate, you will arrive at an operating ratio of 1.19:

$$681,856 \div 575,234 = 1.19$$

The system appears to be financially viable.

## Debt-Service Coverage Ratio

The **debt-service coverage ratio** measures a utility's ability to pay its debt. The adequate debt-coverage ratio will vary from system to system, depending upon the requirements of each lender or, in some cases, state statute.

The Rural Utilities Service (of USDA Rural Development) Water and Waste Disposal loan program is a major federal lender for small and rural utilities. The RUS prefers a minimum debt-service coverage ratio of 1.1 or higher, as calculated by the following formula:

$$\frac{(\text{net operating income} + \text{depreciation})}{\text{total debt service}} = \text{debt-service coverage ratio}$$

Total debt service refers to the total annual payment made during the year on funds borrowed by the system, including principal, interest, and any debt-service reserve deposits that may be required. To calculate the example utility's total debt service for 2010, first locate the line item "Current portion of long-term debt" in Table 1: Sample Balance Sheet on page X. The current portion of long-term debt for this utility for 2010 is \$56,123 and represents the system's principal payments. Add this amount to the line item "Interest expense" from Table 2.

This gives us a total debt service for the sample utility of \$127,794 (principal payment of \$56,123 + interest expense of \$71,671 = \$127,794).

Now add the "Net operating income" from Table 2 of \$106,622 to the "Depreciation expense" from Table 2 of \$112,598 to obtain the sum of \$219,220.

Divide this sum, \$219,220, by the total debt service of \$127,794 to arrive at a debt-service coverage ratio of 1.71 according to the above formula:

$$\frac{\$219,220}{\$127,794} = 1.71$$

With a debt-service coverage ratio of 1.71, the example water utility is able to meet its annual debt-service payment requirements and would not be considered in financial distress.

## The Cash-Flow Statement

The **cash-flow statement** shows how all of a utility's financial transactions during the year increased or decreased the available cash. It also shows how much cash is available at the end of the year after all of the transactions are tallied. The cash-flow statement breaks down transactions into three areas—financing, investing and operation:

- **Financing activities** are transactions resulting from actions to attract investors or creditors. Examples include loans for purchases of assets or major improvements to the system.
- **Investing activities** are transactions made to obtain the property, plant and equipment needed to run the organization. They also include transactions associated with the investment of idle cash, such as purchasing stocks or bonds. Another example is purchasing a new building or new equipment.
- **Operating activities** are the required transactions for the system to perform its function of providing safe drinking water to customers. Operating transactions can include employee salaries, office supplies, minor



## TABLE 3: SAMPLE STATEMENT OF CASH FLOWS

FOR YEARS ENDING DEC. 31, 2010, AND 2009

<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>	<b>2010</b>	<b>2009</b>
Net Income (Loss)	\$ 68,246	\$ 75,988
<b>ADJUSTMENTS TO RECONCILE CHANGE IN NET ASSETS TO NET CASH</b>		
Provided by Operating Activities:		
Depreciation	\$112,598	\$118,338
(Increase) Decrease in Accounts Receivable	5,014	(7,395)
(Increase) Decrease in Prepaid Expenses	(25)	(1,485)
(Increase) Decrease in Interest Receivable	0	(3,053)
(Increase) Decrease in Inventory	1,054	6,938
Increase (Decrease) in Accrued Expenses	90	870
Increase (Decrease) in Payroll-Tax Liabilities	(321)	624
Increase (Decrease) in Accrued Interest	13,355	10,243
Increase (Decrease) in Meter Deposits	(1,098)	0
Increase (Decrease) in Accounts Payable	445	28
Net Cash Used in Operating Activities	\$199,358	\$201,096
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>		
Purchase of Property & Equipment	0	(19,857)
Net Cash Used in Investing Activities	0	(\$19,857)
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>		
Retirement of Long-term Debt	(54,238)	(37,106)
Purchase of Securities	(2,219)	0
Sale of Securities	100,000	0
Net Cash Used in Financing Activities	\$43,543	(\$37,106)
Net Increase in Cash	\$242,901	\$144,133
Cash Balance, Beginning of Year	253,573	109,440
Cash Balance, End of Year	\$496,474	\$253,573

*(Dollar values are for illustration purposes only.)*

repairs to the system, and the purchase of water from other systems.

## Why is the Cash-Flow Statement Important?

The cash-flow statement is often the most overlooked of the three main financial statements. It is also the most difficult to read and understand. It is sometimes thought of as the least important of the three statements. This isn't the case.

The lack of cash flow can kill a company faster than operating at a net loss every day. Even if a system shows more assets than liabilities and shows a net income, it still could be in serious financial distress if the cash flow isn't sufficient to meet obligations. Many organizations that file for bankruptcy have more assets than liabilities on their balance sheets and show a net income on their income statements. However, a review of their cash-flow statements often shows that in the months or years prior to the bankruptcy, they did not have sufficient cash resources to meet their obligations.

An organization that does not have the cash available to pay operating expenses can spiral quickly into financial distress. A negative cash flow can create a chain of events that will destroy your utility:

1. Without available cash in the bank, bills go unpaid or are paid late. Not only does this damage the system's reputation with the party to be paid, but it also can lead to late fees and interest penalties. These must be added to the system's operating costs.
2. Late or missed payments can damage the water system's credit rating. As a result, the system may be required to pay cash for supplies and services. Because cash is already limited, the system may be unable to obtain necessary supplies and services.

3. Without necessary supplies and services, the system must delay or forego necessary maintenance or repair to the system.
4. Without necessary repairs, supplies and services, the quality or quantity of water produced may suffer. The system's reliability can be affected, and service can be disrupted.
5. Eventually the utility may be forced into making emergency repairs or be cited for operational deficiencies by regulatory agencies—or both.

The cash-flow statement can alert you to a possible scenario like the above example because it shows how the accounts on the balance sheet have changed from one year to the next.

There are three areas on the cash-flow statement that are of particular importance in providing a snapshot of your system's fiscal health: accounts receivable, accounts payable and long-term debt.

## Accounts Receivable

The first item to check in your cash-flow statement is the line item "(Increase) Decrease in accounts receivable." In Table 3: Statement of Cash Flows, you will find this line item under the heading "Adjustments to reconcile change in net assets to net cash." As previously discussed, **accounts receivable** are payments owed to you by vendors or customers. An increase in accounts receivable from one year to the next means that the system was owed more at the end of the current fiscal year than it was owed at the end of the last fiscal year. This could be a warning sign, and it's important to determine why the system was owed more this year than last. One possible explanation is simply system growth—more customers means more receivables. However, it also could mean that the system isn't actively pursuing unpaid water bills.

When the system records the amount due from customers, it increases both revenue and assets. The system shows a healthy revenue and net



income as well as increased assets. Everything looks good when the amount due is recorded.

But what happens if the customers don't pay what is actually owed?

The system is out the cost for providing the water services and doesn't have the cash to pay the costs of future service. The problem becomes worse the longer the system allows customers to use its services without paying for them. The system must continue to cover the costs of services for which it is not getting paid. What if other customers stop paying? That means more costs for the system to cover. Although assets and net income may show that the money is expected to come in, without pursuing delinquent accounts, the cash won't actually be there when it's needed. Bottom line: Keep a handle on delinquent accounts.

## Accounts Payable

The next thing you want to examine in a cash-flow statement is the line item "(Increase) Decrease in accounts payable."

To review, accounts payable is just the opposite of accounts receivable. Accounts payable is money your system owes to vendors.

Look again at the sample statement in Table 3. In comparing the accounts payable of the two years listed (2009 and 2010), what do you see? Did this line item increase or decrease? Similar to receivables, an increase in payables simply can be the result of a system experiencing significant growth, but it could also be the result of delaying payments to vendors.

## Long-Term Debt

Sometimes also called "notes payable," long-term debt is a tell-all on the cash-flow statement. This line item can be found in Table 3 under the heading "Cash flows from financing activities." It is

listed as "Retirement of long-term debt."

Compare your debt-retirement activities from the previous year to the current year. Were you able to reduce the long-term debt, or did your debt actually increase? If debt increased, make sure there is a reasonable explanation for the increase. Was it from growth, such as borrowing money to extend lines, upgrade the facility, or purchase equipment? Without a reasonable explanation for increased debt, an increase in this line item from one year to the next is a good indicator that you are not able to keep up with your system's cash-flow requirements.

## The Bottom Line—Literally

Finally, look at the bottom of the cash-flow statement. In Table 3, the bottom shows the "Net increase (decrease) in cash." Is there more or less cash at the end of this year than at the end of the previous year? An increase in receivables, along with an increase in payables and a decrease in cash, could be the result of normal operations. But it also could be worth questioning.

## Facility Master Plan

Your board should produce a facility master plan (often called a capital-improvement plan) for your system, generally encompassing five years. This plan identifies expansion of your service area, treatment upgrades, and replacement of worn-out equipment that will be started within a five-year period. The board should add to the plan each year. Input to the facility master plan should be solicited from your system's bookkeeper or accountant, the operator(s), the administrative staff and a consulting engineer, as well as from all members of the board. Include the rationale behind each expansion, upgrade and replacement. Factors that influence the facility master plan include:



- growth in demand near your existing service area
- deterioration of major system components
- results of sanitary surveys
- local economic and demographic conditions
- compliance with federal and state regulations
- requirements for low-interest capital loans

## PROJECTED FUNDS AVAILABLE FOR CAPITAL-IMPROVEMENT PROJECTS OVER FIVE YEARS

	Current Year (\$)	Year 2 (\$)	Year 3 (\$)	Year 4 (\$)	Year 5 (\$)	Year 6 (\$)	Total (\$)
1	Projected total annual revenues (Current amount projected at 0.005/year)	83,500	83,938	84,358	84,779	85,203	421,778
2	Projected total operating & debt service expenses (Current amount projected at 0.02/year)	76,000	77,520	79,070	80,651	82,264	395,505
3	Projected operating surplus (deficit) (line 1 – line 2 = line 3)	7,500	6,418	5,288	4,128	2,939	26,273
4	Annual amount transferred to capital (Projected at \$5,000/year)	5,000	5,000	5,000	4,128	2,939	22,067
5	Excess revenue transferred to reserves (line 3 – line 4 = line 5)	2,500	1,418	288	0	0	4,206
6	Current-year system reserves (Current balance)	15,000					
7	Current-year amount transferred to capital (Current-year transfer)	8,000					8,000
8	Current-year balance: system cash reserves (line 6 – line 7 = line 8)	7,000					
9	Projected system reserve balances (line 5 + line 8 column 1 = line 9)		9,500	10,918	11,206	11,206	
10	Future allocation transferred from system reserves to capital (Capital transfer amounts for future years)					5,500	5,500
11	Ending system balance reserves (Year 6) (year 5 line 9 – year 5 line 10)					5,706	
12	Projected total capital funds available each year (line 4 + line 7 + line 10 = line 12)	13,000	5,000	5,000	4,128	8,439	
	<b>TOTAL CAPITAL FOR FIVE YEARS (SUM OF LINE 12 COLUMNS)</b>						<b>\$35,567</b>



- requirements for other methods of financing

The most difficult portion of the facility master plan is projecting future revenues and expenses over five years. Some indicators that may help you with the projection are:

- using actual numbers for revenues and expenses from the previous three to five years to obtain an average increase (or decrease) per year
- understanding what causes rates to change and how that will affect the cash-flow balance
- accurately determining the number of customers added to the system and how revenue and expenses will change because of them

Imagine a small water system with annual revenues of \$83,500 and operating and debt-service expenses of \$76,000. A fiscally conservative estimate of annual revenue growth is one-half of one percent, or 0.005. Calculating the projected total annual revenues of this system (line 1 of the following table) involves taking the current-year revenues (\$83,500) and multiplying by the estimated annual revenue growth (0.005) to get \$438. In year 2, the projected total annual revenue would be  $\$83,500 + \$438 = \$83,938$ . For year 3, the projected total annual revenue would be year 2's revenue of \$83,938 multiplied by 0.005 to get \$420;  $\$83,938 + \$420 = \$84,358$ ...and so forth for the remaining years.

Similarly, a fiscally-conservative estimate of annual increase in expenses is two percent, or 0.02. So for year 2, the projected total operating and debt-service expense would be  $(\$76,000 \times 0.02) + \$76,000 = \$77,520$ . For year 3, the projected total operating and debt service expense would be  $(\$77,520 \times 0.02) + \$77,520 = \$79,070$ ...and so forth for the remaining years.

The system's board has decided to allocate \$5,000 annually toward capital projects, with the remainder of the excess revenue transferred to its

financial-reserves account. This can happen only when an operating surplus exists. In its projection of funds, the board realizes that in years 4 and 5, the operating surplus is less than \$5,000. So the board decides to dedicate all operating surplus to capital projects for those two years.

As a result of expected growth over the next five years, there will be additional costs that will impact capital-improvement projects underway. The board decides to budget a little over one year's capital allocation to allow for these costs and will transfer that amount (\$5,500) from its cash reserves to its capital account.

Now that you have the money, what project should you spend it on? Priorities are first sorted by relative importance—improvements that have a direct impact on customer health and those driven by water-quality testing results are both critical improvements, but they might be sorted by the severity of potential consequences. Urgent improvements, such as projects that must meet a given deadline, those that have been delayed for a long time, and those that may have a cost that rises dramatically in the future, may be sorted the same way. A project may be both critical *and* urgent, using the above criteria. More information on planning may be found in Appendix J.

## Annual Audit

Many utilities are required by state law or an external lender to complete an annual audit. Even if this is not required, it is a prudent business practice for public utilities. Potential auditors should have a clear understanding of the system's business, references from other clients in the water or wastewater industry, resumes for personnel working on the audit, and a clean peer review letter. The peer review letter should show that the auditing firm has had its policies and procedures reviewed and that they adhere to industry standards.





Your system should start the auditing process with a request for proposals (RFP). When detailing the job of auditing your system, ask that the bid for the audit be sent in a separate, sealed envelope from the auditor's qualifications. Rank the auditors first by their qualifications, and then look at their bids. If the firm with the best qualifications is not the low bidder, you may have a chance to negotiate your final fee with that firm.

After the audit is completed, the auditor will issue an **auditor opinion**. This is the first page of the full audit. An "unqualified opinion" or "clean opinion" is the best your system can receive. It means the auditor did not find any material misstatements in your system's financial record. The full audit report will include the main financial statements (the balance sheet, the income statement, and the cash-flow statement). It will also include notes to the financial statements. The notes provide valuable information about the nature of operations and the balances shown in the financial statements. The auditor should present the full audit to the entire board and should be available to explain the numbers and to respond to questions. Remember, the auditor works for you.

## How to Succeed at Obtaining Funding

Loans and grants are available for critical and urgent capital projects and for treatment upgrades. Grant funds should be treated as a bonus to the utility, not as a substitute for good management skills. Some federal funding sources for small water and wastewater treatment systems include the following:

- The U.S. Department of Agriculture (USDA) Rural Development's Water and Environmental Programs (WEP) provides loans and grants to drinking

water, wastewater, stormwater and solid-waste facilities in rural areas and in towns with populations of fewer than 10,000. Information is at [www.rurdev.usda.gov/UWEP\\_HomePage.html](http://www.rurdev.usda.gov/UWEP_HomePage.html). USDA also has a grant program for emergency community water assistance, which assists with water quality or quantity problems. USDA offers technical assistance for water conservation and management through a grant program at [www.rurdev.usda.gov/UWP-ecwag.htm](http://www.rurdev.usda.gov/UWP-ecwag.htm).

- The U.S. Environmental Protection Agency (EPA) has several web pages devoted to grants and other funding under the Safe Drinking Water Act (SDWA). For further information, see [http://water.epa.gov/grants\\_funding/sdwa/index.cfm](http://water.epa.gov/grants_funding/sdwa/index.cfm).
- For information on the Drinking Water State Revolving Fund (DWSRF), go to [http://water.epa.gov/grants\\_funding/dwsrf/index.cfm](http://water.epa.gov/grants_funding/dwsrf/index.cfm). This page also contains links to state websites.
- For financial assistance related to capacity development, see the EPA's webpage at <http://water.epa.gov/type/drink/pws/smallsystems/financialhelp.cfm>.
- The EPA's web pages on the Clean Water State Revolving Fund (CWSRF) are at [http://water.epa.gov/grants\\_funding/cwf/cwsrf\\_index.cfm](http://water.epa.gov/grants_funding/cwf/cwsrf_index.cfm). Decentralized systems are eligible for this funding too. Information on water-quality cooperative agreements may be found at Watershed, wetland and beach preservation grants may be found at [http://water.epa.gov/grants\\_funding/index.cfm](http://water.epa.gov/grants_funding/index.cfm).
- The EPA also provides performance partnership grants (PPGs) to states and tribes. PPGs can reduce administrative transaction costs, provide the flexibility to direct resources toward the highest-priority



environmental problems, and support cross-media approaches and initiatives. For more information, visit [www.federalgrantswire.com/performance-partnership-grants.html](http://www.federalgrantswire.com/performance-partnership-grants.html).

- The U.S. Department of Housing and Urban Development (HUD) offers community development block grants (CDBG) that can be used for construction, reconstruction, or demolition of water or wastewater treatment facilities. These grants are administered by individual states. See more at [www.hud.gov/offices/cpd/communitydevelopment/programs/stateadmin/index.cfm](http://www.hud.gov/offices/cpd/communitydevelopment/programs/stateadmin/index.cfm).
- Public Works and Economic Development Facilities grants are available through the U.S. Department of Commerce. If your system meets the requirements for “distressed communities and regions,” money is available for physical infrastructure engineering, design and construction. For more information, go to [www.eda.gov/PDF/ConstructionSTCsFINAL.pdf](http://www.eda.gov/PDF/ConstructionSTCsFINAL.pdf).
- Indian Health Service grants are available for tribal water and wastewater projects. See [www.grants.ihs.gov/index.cfm?module=HHS-2011-IHS-TMD-0001](http://www.grants.ihs.gov/index.cfm?module=HHS-2011-IHS-TMD-0001) for more information.
- The Department of Homeland Security offers a grant to reduce or eliminate damage from natural hazards by elevating or dry flood-proofing existing structures. See [www.federalgrantswire.com/hazard-mitigation-grant.html](http://www.federalgrantswire.com/hazard-mitigation-grant.html) for more information.

## Other Funding:

- The Rural Community Assistance Partnership (RCAP) has small loans available that can be used for pre-development expenses necessary to secure permanent financing for major capital improvements or for funding for small capital-improvement projects to preserve, improve, or

enhance the services of the system. Visit [www.rcap.org/rlf](http://www.rcap.org/rlf) for more information.

The keys to obtaining funding from a federal or state agency are hard work, creativity, timing, and perseverance. Know how the funding agencies work and what types of projects they fund. Then you will be able to develop your project in line with the goals of the funding agency, which causes it to become more likely to be funded. Make a list of all of the beneficiaries of your project—possibilities include individual customers, low-income customers, regulators, businesses, the employees who will work on constructing the project, and the community as a whole. The more diverse the beneficiaries, the more funding opportunities exist. When your system informs the community that it is making improvements, be sure to inform the funding agencies.

If you need assistance in finding the right funding sources or filling out grant and loan applications, the Rural Community Assistance Partnership can help. Contact information for the national office is at [www.rcap.org](http://www.rcap.org), and you can find contact information for the RCAP regional partner for your state at [www.rcap.org/regions](http://www.rcap.org/regions).

## Income Adjustments

After all this monetary analysis, what if your system is not carrying out full-cost pricing? Amazingly, many consumers don't relate their water usage to the size of their water or wastewater bills. And some small systems still charge a flat rate for water usage. How could you change your system's bottom line without raising rates?

**Water audits** can be invaluable in controlling wasted water, thereby controlling costs. If you know how much water is coming from your treatment facility and you can determine how much water your customers are using, the difference between the two amounts is **water loss**. Average water loss across the United States

is around 15 percent of treated water, but it can range from more than 50 percent to around 5 percent at individual facilities. **Apparent water losses** are non-physical losses that occur due to customer meter inaccuracies, data-handling errors in customer-billing systems, and unauthorized consumption—water that is consumed but is not properly measured, accounted for or paid for. These losses cost your system revenue and distort data on customer use. **Real losses** are physical losses of water from the distribution system, including leakage and storage overflows. These losses inflate production costs and stress water resources—the water is pumped and treated, but never reaches the users.

Corrections for apparent water losses are relatively inexpensive procedural changes, but those changes can pay off in a big way. If you compare your billing

process with the expected income for the amount of water treated, you can identify shortcomings that can be remedied. Is water taken without the knowledge and authorization of the system (for instance, by street cleaners, construction water trucks, or others)? Do all customers exist with an account in the customer billing system? Are customer meters replaced before they lose accuracy from wear? Is meter reading accurate and complete? Look for illegal taps, reversed water meters, and other signs of water theft.

Many drinking water systems respond to real losses only after they have received a report of water erupting from a street or a complaint from a customer about a damp basement. If you use this type of reactive leakage response, your system will most likely have excessive leakage that will never be reliably contained. Controlling leakage effectively relies upon a proactive leakage-management program, including a means to identify hidden leaks, optimize repair functions, manage excessive water-pressure levels, and upgrade piping infrastructure before its useful life ends.

Effective technologies have been developed in recent years, including flow and component analysis to quantify leakage amounts, equipment to pinpoint leaks, and pressure management to help systematically reduce leakage. Automatic meter reading (AMR) systems may allow water systems to improve their efficiency and can help identify wasteful usage and leaks to help manage water and revenue losses.

Another way to increase revenue without raising rates is to enforce policies on deadlines for payments without interest penalties, disconnection fees, reconnection fees, and new service or tap fees. If your system is not enforcing its written policies, it is unfair to customers who pay their bills on time. Your system may have a reserve fund for customers who have temporary financial troubles or are in poor health, but exceptions to

## The RCAP Guide on Energy Audits and More

*Sustainable Infrastructure for Small System Public Services: A Planning and Resource Guide*

Rather than presenting theories, this guidebook provides information, worksheets, examples, case studies and resources on water conservation, energy efficiency and renewable-energy resources for small utilities. This planning and resources guide includes a step-by-step process for utility decision makers, staff and community members wanting to operate increasingly efficient utilities. It offers a flexible approach to evaluating sustainable alternatives for utility operations.

The guide is available at [www.rcap.org/commpubs](http://www.rcap.org/commpubs)



system policies should be approved by the entire board. Your board may also want to consider non-refundable membership fees (for water co-ops) or require customers to place a refundable deposit on their water service.

If your system has expensive equipment that tends to sit idle, think about establishing a lease-out program to generate revenue. Your board will have to check with your insurance carrier, and, if your system is a public utility, research state laws to see if this type of program is allowed.

Reducing expenses will increase revenue too. Some methods for cost-cutting include:

- performing energy audits to ensure your equipment is running at peak performance and that your buildings are energy-efficient
- purchasing repair parts, chemicals or office supplies in bulk rather than as you need them
- making cooperative purchases with neighboring systems to receive a quantity discount on the cost
- contracting with neighboring systems for shared transport and disposal of office or treatment wastes

Performing an energy audit can really help save money. In the U.S., the treatment of water and wastewater takes about 50 billion kilowatt-hours (kWh) and costs about \$4 billion annually. Information on energy audits may be found at [http://water.epa.gov/infrastructure/sustain/energy\\_use.cfm](http://water.epa.gov/infrastructure/sustain/energy_use.cfm) and [www.energystar.gov/index.cfm?c=water.wastewater\\_drinking\\_water](http://www.energystar.gov/index.cfm?c=water.wastewater_drinking_water). The USDA has grants available for performing energy audits and incorporating renewable energy into your system; see [www.rurdev.usda.gov/rbs/busp/REAPEA.htm](http://www.rurdev.usda.gov/rbs/busp/REAPEA.htm) for more information. And you can contact RCAP for assistance in performing an energy audit on your system.

Even with your best efforts to reduce expenses,

sometimes raising rates is unavoidable. Rates must be increased when the system's income does not meet expenses despite efforts in other areas of its operation. Some systems adjust rates based upon their five-year projection; others use rate indexing, which increases rates annually based on inflation. It seems that rate increases meet with the most resistance when they are large, so instead of raising rates every three or more years, think about smaller annual increases. Try to time the rate increase to avoid periods when you know that your customers will have extra expenses, such as during holidays or back-to-school, or during high water-consumption months (unless the rate increase is driven by water conservation). No matter how your board chooses to adjust rates, inform customers ahead of time. No one likes a big surprise in their bill.

## Recordkeeping

Accurate financial recordkeeping is a must for utilities of all sizes and absolutely indispensable for small systems. If you don't know how much water your system is producing or how much wastewater your system is treating, you won't be able to plan for future treatment and population growth in a meaningful way. Water use and water production cannot be accurately estimated without the use of meters at the wells, tanks, and individual users' sites. Records should be organized so that individual users, farms/ranches, and industrial users are separately identified. Meter size is a good way to accomplish this.

The National Archives and Records Administration (NARA) has issued guidance for federal employees on the retention of records mandated by federal law. If you don't already have a records-retention policy in place, this guidance is a good place to start—otherwise, you may feel you are drowning in a sea of papers and electronic files. Another place for guidance specific to water and wastewater



utilities is the U.S. Environmental Protection Agency. EPA's page for records is [www.epa.gov/records/index.htm](http://www.epa.gov/records/index.htm). It also has a page called the Ten Commandments of Records Retention:

1. Identify the functions and activities for which your board is responsible and determine what records are needed to document those activities and functions.
2. Create sufficient records to document those activities and functions.
3. Maintain those records in a way that allows all persons who need access to find and retrieve what they need, either using a centralized file room, using a decentralized system with files located at the workstations of the people who created them, or using a combination of the two systems. Create a file plan guide, which lists the records kept in your office and the manner in which they are organized and maintained. You may want to use the EPA's file plan structure to align your files with theirs for easy records retention during an audit. It can be found at [www.epa.gov/records/tools/toolkits/filecode/file\\_structure.pdf](http://www.epa.gov/records/tools/toolkits/filecode/file_structure.pdf). Electronic records guidance may be found at [www.epa.gov/records/tools/erks.htm](http://www.epa.gov/records/tools/erks.htm). Imaged (scanned) records guidance may be found at [www.archives.gov/records-mgmt/faqs/imaged.html](http://www.archives.gov/records-mgmt/faqs/imaged.html).
4. Remove or destroy records only with authorization; don't retain records authorized for destruction. Match your records to the records schedules found on the National Records Program website ([www.epa.gov/records/policy/schedule/index.htm](http://www.epa.gov/records/policy/schedule/index.htm)). An Excel file with disposition instructions for water and wastewater treatment facilities may be found at [www.epa.gov/records/tools/toolkits/filecode/file\\_structure\\_DI.xls](http://www.epa.gov/records/tools/toolkits/filecode/file_structure_DI.xls). This file includes records retention for as little as 90 days and as long as 30 years, depending upon the nature of the record.
5. Keep official records separate from non-record

materials. Official records include vital records (those essential and required to be immediately available in times of emergency) and non-critical records. Reference materials, personal papers, and extra copies of documents, publications and forms are **non-record materials**.

6. Make someone responsible for the records program, and determine what he/she needs to do the job correctly.
7. Transfer records identified as permanent to your records storage area as required.
8. Protect vital records appropriate to their value. Imagine how you'd generate vital records during a power outage or if you didn't have access to your centralized files because the building had been destroyed in a tornado. Keep several duplicate copies in secured areas. Date the records, and when you update the master copy, update the duplicates as well.
9. Protect records that contain security classified, confidential business, or other types of sensitive information with appropriate safeguards.
10. Do all of this in a manner that is as cost-effective as possible.

The Rural Utilities Loan Servicing System (RULSS) provides grants and loans for water and environmental programs of the Rural Utilities Service and maintains a database for information pertaining to these grants and loans. Records pertaining to loans and grants, including borrower information (USDA contact information, board officer contact information, congressional district and representative profile information, bank information, counties served, services provided, migration and population data, engineering information, and other pertinent records), should be kept for ten years. Unsuccessful applications for grants and loans should be retained for five years.

Housing and Urban Development block-grant information and other financial award information



should be kept for six years after the money is awarded. Photographs, video recordings and scans should be kept for five years.

Laboratory data is really important, not only for monitoring the performance of your treatment system, but also for regulatory purposes and as backup in case of legal actions. Both the person collecting the data and the one inputting the data should be identified in the records. The time and date of the data collection is required for every piece of datum recorded. The Safe Drinking Water Act of 1996 requires that monitoring and reporting records be retained for ten years .

RCAP has information, training and assistance available for all aspects of financial operations for which a board is responsible. To contact RCAP, visit [www.rcap.org](http://www.rcap.org).



## ADVICE FOR NEW (AND OLD) BOARD MEMBERS FROM H.B. CALVERT

- **Meet with your system’s operator, other board members, or community members** to get a general idea about the system. Ask and learn about such things as water sources, treatment, storage capacity, problems in the distribution lines (leaks), etc. As a board member, you are the boss of your system’s operator and should have a general idea of what it takes to operate the system and what expenses are to be expected. I found in my work that a town’s board spends more time hiring someone to mow a park than they do to hire someone to operate and maintain probably the biggest investment the town has ever made. The reason: They know what it takes to mow a park but probably don’t have the slightest clue what it takes to operate the water system.
- At a minimum, **every system should have a written operational plan for the system.** It doesn’t have to be elaborate but should state what needs to be done, how often it needs to be done, and who is responsible for doing it. The information in the operations plan can then be used to develop an operator’s job description, which eliminates the “I didn’t know that was my job or responsibility” excuse.
- **There are two types of board members:** the ones who won’t leave the system alone and makes “adjustments” for the operator and the ones who don’t want to hear anything about the system unless it completely fails. **A good board member is somewhere between those two.**
- **Review and understand the system’s budget** to make sure all expenses and revenues are included, the system can support itself financially, and all utility finances are separate from each other and from the town’s general fund. A system that has financial problems is more likely to fail as one having operational problems. A system must show a positive cash flow. Even though you may have a certificate of deposit tucked away, if you do not have a positive cash flow, that CD will be gone in a short while if it is used to supplement day-to-day operations.
- No one likes rate increases, but when the need arises to raise rates, **be informed and willing to explain the need for a rate increase to your customers.**

**H.B. Calvert retired as a Technical Assistance Provider in 2011 after serving for nearly 20 years on the staff of the Midwest Assistance Program, the Midwest RCAP.**









# Glossary

**Accounts payable:** Money the system owes for the normal operation of business, including utility (electricity, telephone, etc.) bills, office supplies, reimbursement for travel expenses, and the like.

**Accounts receivable:** Money owed to the system, including outstanding water bills, connection fees, reconnection fees, and the like.

**Accrual basis of accounting:** A means of accounting under which the system records revenue when it is earned (not when it is actually paid) and records expenses when they are incurred (when the system is legally obligated to pay the debt, not when the system actually pays the expense).

**Accrued interest:** Interest that has been incurred on a debt but not yet paid to the lender by the system. For example, long-term loans or bonds that require annual or semi-annual payments have incurred interest during the months between payments.

**Accrued liabilities:** Money the system owes its employees or customers, including salaries, unpaid vacation or sick leave, payroll taxes withheld but not yet remitted to the taxing agency, and security deposits from customers.

**Acidic:** The condition of water or soil that contains a sufficient amount of acid substances to lower the pH below 7.0.

**Action level:** A concentration of a contaminant above which additional actions are required by the water system to ensure public health and safety.

**Activated alumina:** A treatment process for removing contaminants from water or wastewater, involving the absorption of contaminants onto the alumina.

**Aeration:** The process of adding air to water. Air can be added to water by either passing air through water or passing water through air.

**Aerobic:** A condition in which “free” (atmospheric) or dissolved oxygen is present in the water.

**Algae:** Microscopic plants that contain chlorophyll and live floating or suspended in water. They also may be attached to structures, rocks or other submerged surfaces. They are food for fish and small aquatic animals. Excess algal growths can impart tastes and odors to potable water. Algae produce oxygen during sunlight hours and use oxygen during the night hours. Their biological activities appreciably affect the pH and dissolved oxygen of the water.

**Alkalinity:** The capacity of water to neutralize acids. This capacity is caused by the water’s content of carbonate, bicarbonate, hydroxide and occasionally borate, silicate, and phosphate. Alkalinity is expressed in milligrams per liter of equivalent calcium carbonate. Alkalinity is not the same as pH because water does not have to be strongly basic (high pH) to have a high alkalinity. Alkalinity is a measure of how much acid can be added to a liquid without causing a great change in pH.

**Anaerobic:** A condition in which “free” (atmospheric) or dissolved oxygen is not present in water.

**Apparent water loss:** Non-physical water losses that occur due to customer meter inaccuracies, data-handling errors in customer billing systems, and unauthorized consumption.

**Aquifer:** A natural, underground layer of porous, water-bearing materials (sand, gravel) usually

capable of yielding a large amount or supply of water.

**Artesian:** Water held under pressure in porous rock or soil confined by impermeable geologic formations. An artesian well is free-flowing.

**Asset management:** A planning process for efficiently preserving or replacing critical infrastructure.

**Assets:** The total economic resources of the system that are expected to provide benefits to the system in the future. Assets are listed in an order based on how easily they are converted to cash: cash, cash equivalents, current assets, long-term assets, and property, plant and equipment.

**Auditor opinion:** The results page of an external audit, on which the auditor states whether or not mistakes were found in the system's financial records. An "unqualified opinion" or a "clean opinion" are the best that a system can hope for. They mean no material mistakes were found.

**Backflow:** A reverse flow condition created by a difference in water pressures, which causes water to flow back into the distribution pipes of a potable water supply from any source or sources other than an intended source.

**Bacteria** (singular: **bacterium**): Microscopic living organisms usually consisting of a single cell. Bacteria can aid in pollution control by consuming or breaking down organic matter in sewage, or by similarly acting on oil spills or other water pollutants. Some bacteria in soil, water or air may also cause human, animal and plant health problems.

**Balance sheet:** Also known as the **statement of financial position**, this document shows a system's net worth (how much the system is worth at a particular point in time). The balance sheet reflects how total assets = liabilities + equity.

**Benchmarking program:** The process of determining who is the very best, who sets

the standard, and what that standard is.

Benchmarking allows you to compare your system with others, to identify comparative strengths and weaknesses and learn how to improve.

**Best management practices (BMPs):**

Structural, nonstructural and managerial techniques that are recognized to be the most effective and practical means to control nonpoint source pollutants yet are compatible with the productive use of the resource to which they are applied. BMPs are used in both urban and agricultural areas.

**Biochemical oxygen demand (BOD):** The amount of oxygen consumed by microorganisms (mainly bacteria) and by chemical reactions in the biodegradation of organic matter.

**Biosolids:** The nutrient-rich organic materials resulting from the treatment of sewage sludge.

**Blending:** When a drinking water supply system can or does combine (for example, via connecting piping and associated valves) water from more than one well or surface water intake, or from a combination of wells and intakes.

**Business continuity plan:** A plan for working out how to stay in business in the event of a disaster or emergency. These events include local incidents like building fires, regional incidents like earthquakes, or national incidents like pandemic illnesses.

**Capital costs:** Costs (usually long-term debt) of financing construction and equipment. Capital costs are usually fixed, one-time expenses which are independent of the amount of water produced.

**Cash:** The amount of money currently available in the system's demand accounts.

**Cash equivalents:** Securities that have a maturity date of less than 90 days from the balance sheet date.



**Cash-flow statement:** This document shows how each financial transaction (financing activities, investing activities, and operating activities) conducted by the system affects its cash.

**Centralized system:** One in which wastewater is collected from the community and pumped to a central treatment facility.

**Certification:** Minimum professional standards for the operation and maintenance of public water and wastewater systems (usually applied to a system's operators).

**Clean Water Act (CWA):** The federal legislation that establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but it was significantly reorganized and expanded in 1972. "Clean Water Act" became the act's common name with amendments in 1977. Under the CWA, EPA has implemented pollution-control programs, such as setting wastewater standards for industry and water-quality standards for all contaminants in surface waters. The CWA made it unlawful to discharge any pollutant from a point source into navigable waters unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges.

**Coagulation:** The clumping together of very fine particles into larger particles caused by the use of chemicals (coagulants). The chemicals neutralize the electrical charges of the fine particles and cause destabilization of the particles. This clumping together makes it easier to separate the solids from the water by settling, skimming, draining, or filtering.

**Coliform:** A group of bacteria found in the intestines of warm-blooded animals (including

humans) and also in plants, soil, air and water. Fecal coliforms are a specific class of bacteria that inhibit the intestines of warm-blooded animals only. The presence of coliform is an indication that the water is polluted and may contain pathogenic organisms.

**Collection system:** The pipes, tanks, valves, and pumps that work together to transport municipal waste from the point it is generated to the treatment system.

**Combined filter effluent:** Water that exits the filtering process and goes to a clearwell for disinfection. For water systems using conventional or direct filtration, the maximum turbidity allowed by the EPA is 1 nephelometric turbidity unit (NTU), and at least 95 percent of turbidity measurements taken each month shall be < 0.3 NTU. For water systems using slow sand, diatomaceous earth, or alternative technologies approved by the state, the maximum turbidity allowed by the EPA is 5 NTU, and at least 95 percent of turbidity measurements taken each month shall be < 1 NTU.

**Communitor:** A machine that performs size reduction of debris in wastewater.

**Community water system (CWS):** A public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

**Compliance:** Meeting the laws and regulations established by the U.S. Environmental Protection Agency (EPA), the state, the tribe, or other applicable governing entities.

**Confined aquifer:** An aquifer in which groundwater is confined under a pressure which is significantly greater than atmospheric pressure.

**Consent agenda:** An agenda that contains items that need to be voted upon but do not need further discussion. Common items on a consent agenda are approval of meeting minutes and acceptance of reports that are attached to the minutes.



**Consumer confidence report (CCR):** An annual report on the quality of water treatment, given to consumers by community water systems.

**Contaminant level violation:** A violation of EPA regulations that occurs when a contaminant which has the potential to cause illness is not removed to at least the level described in the regulations.

**Contamination:** The introduction into water of microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the water unfit for its next intended use.

**Conventional filtration:** A process for filtering water, including coagulation, flocculation, and sedimentation, prior to filtration. Also called **complete treatment or conventional treatment**.

**Cost/benefit analysis:** A quantitative evaluation of the costs that would be incurred versus the overall benefits to society of a proposed action, such as the establishment of an acceptable dose of a toxic chemical.

**Cost sharing:** A publicly financed program through which society, as the beneficiary of environment protection, shares part of the cost of pollution control with those who must actually install the controls.

**Cross-connection:** Any actual or potential connection between a drinking (potable) water system and an unapproved water supply or other source of contamination. For example, if a pump moves nonpotable water and is hooked into the groundwater system to supply water for the pump seal, a cross-connection or mixing between the two water systems can occur. This mixing may lead to contamination of the drinking water.

**Cryptosporidium:** A waterborne microorganism (protozoa) that causes gastrointestinal illness (cryptosporidiosis), including diarrhea and vomiting. These tiny pathogens are found in surface water sources like reservoirs, lakes, and rivers.

**Current assets:** Items that can be converted to cash within one year of the date of the balance sheet, including cash, cash equivalents, accounts receivable, inventory, short-term investments, and prepaid assets.

**Current liabilities:** Maturities on long-term debt, accounts payable, accrued liabilities and other short-term notes to be paid by the system.

**Current maturities on long-term debt:** The principal amount the system is required to pay on long-term loans over the next 12 months. This is *not* equivalent to the total loan payment amount, which is the principal plus interest.

**Current ratio:** See **liquidity ratio**.

**Debt-service coverage ratio:** A measure of the system's ability to pay its debt, this ratio (also called the **coverage ratio**) is calculated by dividing the sum of the net operating income plus depreciation by the total debt service. An adequate debt-service coverage ratio varies from system to system, depending upon lenders' requirements or sometimes state statute. The Rural Utilities Service Water and Waste Disposal Loan Program prefers a minimum debt-service coverage ratio of 1.1 for financial viability.

**Decentralized system:** A system in which wastewater is collected and treated onsite rather than gathered in a collection system and transported to a wastewater treatment plant.

**Deficit equity:** When the system has incurred more in net losses over its life than net income.

**Depreciation:** The decrease in the value of fixed assets from normal wear and tear due to age and typical use. The easiest method used to calculate depreciation is the straight-line method, but other methods include the declining-balance method, the activity-depreciation method, the sum of years' digits method, and others.



**Direct filtration:** A process for filtering water that includes coagulation and flocculation prior to filtration. Direct filtration differs from conventional filtration in that the sedimentation process (allowing floc to settle out from the water prior to filtration) is not performed.

**Disinfectant:** Any oxidant, including, but not limited to, chlorine, chlorine dioxide, chloramines, and ozone, that is added to water in any part of the treatment or distribution process and is intended to kill or inactivate pathogenic microorganisms.

**Disinfection byproduct (DBP):** A compound formed by the reaction of a disinfectant, such as chlorine with organic material in the water supply.

**Disinfection profile:** If a public water system has an annual average level of total trihalomethanes (TTHM) of 0.064 mg/L or an annual average level of haloacetic acids (HAA5) of 0.048 mg/L, the system must develop a disinfection profile. The profile is developed by compiling daily *Giardia lamblia* log inactivation values for 12 months, and for systems using chloramines or ozone for primary disinfection, compiling daily virus log inactivation values for 12 months. Log inactivation values are calculated using daily measurements of operational data collected during peak-hour flows.

**Distribution system:** The system of tanks, pipes, pumps, and valves that delivers treated water from the drinking water treatment system to the customer.

**Drinking Water State Revolving Loan Funds (DWSRF or simply SRF):** Federal money provided to qualifying states to address problems of deteriorating water systems. States may provide these funds in the form of low- or no-interest loans to eligible water systems for upgrading their facilities and ensuring compliance with drinking water standards. DWSRF loan programs vary from state to state.

***E. coli*** (full name: ***Escherichia coli***): a Gram-negative rod-shaped bacterium that is commonly found in the lower intestine of mammals, most of which are harmless, but some of which can cause gastrointestinal distress in humans.

**Echovirus:** An ECHO (Enteric Cytopathic Human Orphan) virus is a type of RNA virus that belongs to the genus *Enterovirus* of the *Picornaviridae* family. Echoviruses are found in the human gastrointestinal tract, and exposure to the virus causes other opportunistic infections and diseases.

**Effluent:** Water or some other liquid—raw, partially or completely treated—flowing from a reservoir, basin, treatment process or treatment plant.

**Emergency operating procedures (EOP):** A detailed set of written procedures documenting changes in standard operating procedures during emergencies, such as severe weather events.

**Emergency management assistance compact (EMAC):** A voluntary agreement between neighboring water or wastewater treatment systems that are not located within a single state to detail assistance in emergencies.

**Emergency-response plan (ERP):** A written document that details the water or wastewater system's plan of action for responding to emergencies, disasters, and other unforeseen events. Updated ERPs should incorporate the results of the vulnerability assessment (VA) and must address terrorist or other intentional acts. The ERP may include detailed steps that the public water system will take to respond to potential or actual emergencies including, but not limited to, the following: loss of water supply from a source; loss of water supply due to a major component failure; damage to power supply equipment or loss of power; contamination of water in the distribution system from backflow or other causes; and the like. The ERP may also include a description of the procedures, structures and equipment used

to respond to potential or actual emergencies. Requirements, guidelines and compliance checklists are available through the state primacy agency and/or state drinking water program.

**Equity:** The net value of the system over time. Equity increases each year the system earns a net income (has more revenue than expenses), and equity decreases each year the system incurs a net loss (has more expenses than revenue).

**Exemption:** A state with primacy (primary regulatory authority) may relieve a public water system from a requirement respecting an **MCL**, treatment technique or both, by granting an exemption if certain conditions exist. These are: 1) the system cannot comply with an MCL or treatment technique due to compelling factors, which may include economic factors; 2) the system was in operation on the effective date of the MCL or treatment-technique requirement; and 3) the exemption will not result in an unreasonable public health risk.

**Filtration:** A process for removing particulate matter from water by passage through porous media.

**Financially sustainable:** A system that provides water or wastewater treatment services to customers at a rate that consistently generates enough money to meet all expenses, both in the short- and long-term.

**Financing activities:** Transactions resulting from activities to attract investors or creditors (for instance, loans to purchase assets or for major system repairs).

**Finished water:** Water that has passed through a water treatment plant—when all of the treatment processes are completed or “finished.” This water is ready to be delivered to consumers.

**Fiscal year:** A 12-month period that is the basis of the system’s operations. A fiscal year may be different from a calendar year, and if it is, common spans are July 1 to June 30 or October 1 to

September 30 (which is the federal government’s fiscal year).

**Fixed assets:** The land, buildings, furniture and fixtures the system owns and uses in its day-to-day operations.

**Floc:** Clumps of bacteria and particulate impurities that have come together and formed a cluster. Found in flocculation tanks and settling or sedimentation basins.

**Flocculation:** The gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles.

**Flow diagram:** A very simple diagram that shows where water or wastewater comes from, what treatment processes it goes through, and where it exits the treatment system.

**Full-cost pricing:** Calculating and setting rates that reflect the true cost of producing and selling water, including operating expenses, debt service, and reserve funds for equipment replacement and future improvements or expansion.

**Fungi:** Mushrooms, molds, mildews, rusts, and smuts that are small, non-chlorophyll-bearing plants lacking roots, stems and leaves. They occur in natural waters and grow best in the absence of light. Their decomposition may cause objectionable tastes and odors in water.

**Giardia lamblia:** A microorganism (protozoa), sometimes found in drinking water, that may cause diarrhea, cramps, and illness (giardiasis). *Giardia* is commonly found in surface water sources like reservoirs, lakes, and rivers.

**Grey water:** Wastewater other than sewage, such as sink drainage or washing machine discharge.

**Grinder:** A machine that performs size reduction of debris in wastewater.

**Groundwater:** The supply of fresh water found beneath the Earth’s surface, usually in



aquifers, that is often used for supplying wells and springs. Because groundwater is a major source of drinking water, there is growing concern over areas where leaching agricultural or industrial pollutants or substances from leaking underground storage tanks are contaminating ground water.

**Groundwater under the direct influence (GWUDI) of surface water:** Any water beneath the surface of the ground with: 1) significant occurrence of insects or other macroscopic organisms, algae, or large-diameter pathogens such as *Giardia lamblia*; or 2) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the state. The state determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well-construction characteristics and geology with field evaluation.

**Haloacetic acids (HAA5):** A group of chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The EPA-regulated haloacetic acids are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

**Headworks:** The first process in wastewater treatment, which removes large debris (cans, plastic bags, and other garbage) from the wastewater stream.

**Hydraulic analysis:** An analysis of the factors that contribute to how well water moves through a treatment system (such as headloss, pipe age and condition, friction, and other factors).

**Hydraulic capacity:** The maximum amount of water that can pass through a water or wastewater treatment system.

**Incident command system (ICS):** Common terminology that allows diverse incident-management and support organizations to work together across a wide variety of incident-management functions and hazard scenarios. Common terminology covers:

- organizational functions and functional units with incident-management responsibilities are named and defined; terminology for the organizational elements is standard and consistent.
- resource descriptions, including personnel, facilities, and major equipment and supply items that support incident management activities, are given common names and are classified according to their capabilities to help avoid confusion and to enhance interoperability.
- incident facilities in the vicinity of the incident area that will be used during the course of the incident.

Incident-response communications (during exercises and actual incidents) should feature plain-language commands so they will be able to function in a multijurisdiction environment. Field manuals and training should be revised to reflect the plain-language standard.

**Income statement:** Also known as the **statement of activities**, this document shows the results of operations over a period of time (how much revenue the system has earned versus the amount of expenses the system has incurred).

**Indentures:** Written agreements between the issuer of a bond and the bondholders, usually specifying the interest rate, maturity date, convertibility and other terms.





**Influent:** Water or other liquid—raw or partially flowing into a reservoir, basin, treatment process or treatment plant.

**Inorganic:** Material such as sand, salt, iron, calcium salts and other mineral materials. Inorganic substances are of mineral origin, whereas organic substances are usually of animal or plant origin.

**Inventory:** The value of products related to the business that are or will become available for sale within the next year, such as new meters, pipe, equipment and replacement parts.

**Investing activities:** Transactions resulting from activities to obtain property, facilities and equipment necessary to run the system, or to invest idle cash (such as purchasing stocks or bonds, new buildings or new equipment).

**Ion exchange:** A technology for removing charged contaminants from water or wastewater.

**Leverage ratio:** A measure of the system's reliance upon debt, this ratio is calculated by dividing equity by total assets. Systems with a leverage ratio of less than 0.30 are considered to be in financial distress.

**Liabilities:** What the system owes to others.

**Life of assets:** The length of time the asset is assumed to be used. Buildings have a normal life of 30 years. Land value does not depreciate.

**Liquidity:** The ability to convert an asset into cash.

**Liquidity ratio:** A measure of the system's ability to pay off current liabilities, this ratio is calculated by dividing the system's current assets by its current liabilities. Systems with a liquidity ratio of less than 1.5 are considered to be in financial distress.

**Long-term assets:** Items that cannot be converted to cash within one year of the date

of the balance sheet, such as investments with maturity dates greater than one year.

**Long-term debt:** See the definition for **long-term liabilities**.

**Long-term liabilities:** Loans expected to be paid back by the system over several years, such as capital-improvement loans. The principal amount to be repaid within one year is recorded in current liabilities as a current maturity; the remainder of the principal is listed as a long-term liability.

**Macerator:** A machine that performs size reduction of debris in wastewater.

**Maximum contaminant level (MCL):** The maximum permissible level of a contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a public water system, except in the case of turbidity, where the maximum permissible level is measured at the point of entry to the distribution system. Contaminants added to the water under circumstances controlled by the user are excluded from this definition, except those contaminants resulting from the corrosion of piping and plumbing caused by water quality.

**Maximum contaminant level goal (MCLG):** The maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are non-enforceable health goals.

**Membrane:** A technology for removing contaminants from water or wastewater; types include microfilters, ultrafilters, reverse-osmosis and nanofilters.

**Microgram per liter (µg/L):** A measure of concentration of a dissolved substance. A concentration of one µg/L means that one microgram of a substance is dissolved in each liter of water. For practical purposes, this unit is equal to parts per billion (ppb), since one liter of water is



equal in weight to one billion micrograms. Thus, a liter of water containing 10 micrograms of lead has 10 parts of lead per one billion parts of water, or 10 parts per billion (10 ppb).

**Milligrams per liter (mg/L):** A measure of concentration of a dissolved substance. A concentration of one mg/L means that one milligram of a substance is dissolved in each liter of water. For practical purposes, this unit is equal to parts per million (ppm), since one liter of water is equal in weight to one million milligrams. Thus, a liter of water containing 10 milligrams of calcium has 10 parts of calcium per one million parts of water, or 10 parts per million (10 ppm).

**Municipal sewage:** Wastes (mostly liquid) originating from a community. Municipal sewage may be composed of domestic wastewaters and/or industrial wastewaters.

**National Pollutant Discharge Elimination System (NPDES) Permit:** The regulatory agency document issued by either a federal or state agency that is designed to control all discharges of pollutants from point sources in U.S. waterways. NPDES permits regulate discharges into navigable waters from all point sources of pollution, including industries, municipal treatment plants, large agricultural feed lots, and return-irrigation flows.

**Nephelometric:** A means of measuring turbidity in a sample by using an instrument called a nephelometer. A nephelometer passes light through a sample, and the amount of light deflected (usually at a 90-degree angle) is then measured in nephelometric turbidity units (NTU).

**Net operating income/loss:** Calculated by subtracting operating expenses from revenue.

**Non-community water system (NCWS):** A public water system that is not a community water system. There are two types of NCWSs: transient and non-transient.

**Non-point source:** Water pollution that results from land runoff, atmospheric deposition, drainage, or seepage of contaminants. Major nonpoint sources include agricultural, silvicultural, and urban runoff.

**Non-potable:** Water that may contain objectionable pollution, contamination, minerals, or infective agents and that is considered unsafe and/or unpalatable for drinking.

**Non-record material:** Extra copies of documents, stockpiles of publications and processed documents, and library material used for reference or exhibition purposes.

**Non-transient non-community water system (NTNCWS):** A public water system that regularly serves at least 25 of the same nonresident persons per day for more than six months per year.

**Operating activities:** Transactions resulting from activities necessary for the system to perform its function (examples include salaries, office supplies, minor system repairs, purchases of water from other systems, and the like).

**Operating expenses:** Expenses incurred from the system's normal operation, including salaries, fringe benefits, utility (electricity, telephone, etc.) bills, insurance, water purchased for resale, etc.

**Operating ratio:** A measure of the system's profitability, this ratio is calculated by dividing the operating revenues by the operating expenses. An operating ratio of less than 1.0 is considered to be financially distressed.

**Operations and maintenance (O&M) manual:** A document detailing how the water or wastewater treatment system is operated and maintained. The level of detail is such that someone who has not performed these duties can use the manual to operate or repair equipment without additional instruction.



**Organic:** Substances that come from animal or plant sources. Organic substances always contain carbon.

**Other income and expenses:** Includes interest income, interest expenses, gains/losses on equipment sales, and unusual items that are not related to the regular operation of the system.

**Oxidation:** The loss of electrons from one substance, which causes the substance to become more positively charged.

**Part per billion (ppb):** A measure of concentration of a dissolved substance, analogous to µg/L.

**Part per million (ppm):** A measure of concentration of a dissolved substance, analogous to mg/L.

**Pathogens:** Microorganisms that can cause disease in other organisms or in humans, animals and plants. They may be bacteria, viruses, or parasites and are found in sewage in runoff from animal farms or rural areas populated with domestic and/or wild animals, and in water used for swimming. Fish and shellfish contaminated by pathogens, or the contaminated water itself, can cause serious illnesses.

**Payable:** The amount of money a system owes its vendors, energy providers, etc.

**pH:** An expression of the intensity of the basic or acid condition of a liquid. Mathematically, pH is the logarithm (base 10) of the reciprocal of the hydrogen ion concentration, [H+].

$$\text{pH} = \log (1/[\text{H}^+])$$

The pH may range from 0 to 14, where 0 is most acid, 14 most basic, and 7 neutral. Natural waters usually have a pH between 6.5 and 8.5.

**Point source:** A discrete conveyance, such as a pipe or a ditch, through which pollutants are discharged to U.S. waters (like rivers, lakes or oceans). The Clean Water Act authorizes the National Pollutant Discharge Elimination

System (NPDES) permit program to regulate point sources.

**Policy:** A formal, written document outlining the ways a business intends to conduct its affairs and act in specific circumstances.

**Pollutant:** Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

**Prepaid assets:** Expenses paid in advance, such as insurance policies for which the annual premiums are paid upfront.

**Preventative maintenance:** Maintenance performed according to a schedule, done to avoid emergency repairs and keep equipment in running order.

**Primacy:** The responsibility for ensuring that a law is implemented and the authority to enforce a law and related regulations.

**Primacy agency:** A body, often a state agency, that has the first or main responsibility for administering and enforcing regulations.

**Primary treatment:** The step in the treatment of water or wastewater designed to remove large contaminants from the water by gravity or other means.

**Prior appropriation:** A doctrine of water law that allocates the right to use water on a first-come, first-served basis.

**Property, plant and equipment:** See definition of fixed assets.

**Protective programs:** The EPA designation refers to planning for emergencies, whether they are natural, human-caused or epidemiologic in nature.

**Protozoa:** Single-cell organisms that move by using tails (flagella), hairs (cilia) or foot-like structures (pseudopods). *Giardia lamblia* is a flagellate protozoa.



**Proxy voting:** Designating another board member to vote in place of an absent member in the same manner the absent member would vote.

**Public notification:** A written notification of drinking water violations or other situations that may threaten human health, distributed by broadcast, mail or other means.

**Public water systems (PWS):** A system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals at least 60 days out of the year. Public water systems include: 1) any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system, and 2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a community water system or a non-community water system.

**Real water loss:** Actual water lost between treatment and delivery to customers, including water that leaks from distribution lines or valves and water that is stolen from hydrants or after the meter.

**Receivable:** The amount of money a customer owes the system.

**Receiving waters:** All distinct bodies of water that receive runoff or wastewater discharges, such as streams, rivers, ponds, lakes, and estuaries.

**Record:** All books, papers, maps, photographs, machine-readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by the water or wastewater system in connection with the transaction of public business and preserved or appropriate for preservation by that system as evidence of the organization, functions, policies, decisions, procedures, operations, or other

activities or because of the informational value of data in them.

**Revenue:** Income that has been earned by the system, including water sales, late charges, service charges, and the like.

**Riparian rights:** A doctrine of state water law under which a land owner is entitled to use the water on or bordering his property, including the right to prevent diversion or misuse of upstream waters. Riparian land is land that borders on surface water.

**Rotavirus:** The most common cause of severe diarrhea among infants and young children and one of several viruses that cause infections often called stomach flu (despite having no relation to influenza). It is a genus of double-stranded RNA virus in the family Reoviridae. By the age of five, nearly every child in the world has been infected with rotavirus at least once.

**Safe Drinking Water Act (SDWA):** The federal legislation that defines a public water system, sets the standards for state regulation of public water systems, and authorizes funding for certain water systems. The legislation was enacted in 1974 and amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs and groundwater wells. The SDWA does not regulate private wells that serve fewer than 25 individuals. The SDWA authorizes the U.S. Environmental Protection Agency (EPA) to set national, health-based standards for drinking water to protect against both naturally occurring and human-made contaminants that may be found in drinking water. EPA, states, and water systems then work together to make sure that these standards are met.

**Sanitary sewer:** A sewer that transports only wastewaters (from domestic residences and/or industries) to a wastewater treatment plant.

**Sanitary survey:** A periodic inspection of a water system's facilities, operations and recordkeeping. The inspections identify conditions that may present a sanitary or public health risk. The federal Safe Drinking Water Act (SDWA) calls for a routine sanitary survey of all public drinking water systems once every five years, except for community surface water systems, which are to be surveyed once every three years.

**Screen:** A device used to remove large objects such as rags, plastics bottles, bricks, solids, and toy action figures from the waste stream entering the treatment plant and damaging valves or pumps.

**Secondary treatment:** The portion of wastewater treatment that removes the biological waste component from the influent wastewater.

**Septic system:** An onsite system designed to treat and dispose of domestic sewage; a typical septic system consists of a tank that receives wastes from a residence or business and a system of tile lines or a pit for disposal of the liquid effluent that remains after decomposition of the solids by bacteria in the tank.

**Sewer:** An underground system of conduits (pipes and/or tunnels) that collect and transport wastewaters and/or runoff. Gravity sewers carry free-flowing water and wastes; pressurized sewers carry pumped wastewaters under pressure.

**Short-term investments:** Investments with maturity dates greater than 90 days from the balance sheet date, but shorter than one year from the balance sheet date.

**Sludge:** The settleable solids separated from water during processing.

**Softening:** Water having a low concentration of calcium and magnesium ions. According to U.S. Geological Survey guidelines, soft water is water having a hardness of 60 milligrams per liter or less.

**Sole source aquifer:** An aquifer that supplies 50 percent or more of the drinking water of an area.

**Source water protection plan:** A plan to prevent, reduce or eliminate known and potential sources of contamination within a drinking water source protection area.

**Standard operating procedures (SOPs):** A set of written instructions that document a routine or repetitive activity followed by an organization. The development and use of SOPs are an integral part of a successful quality system as it provides individuals with the information to perform a job properly, and facilitates consistency in the quality and integrity of a product or end-result.

**Statement of activities:** See definition of **Income statement**.

**Statement of financial position:** See definition of **balance sheet**.

**Storm sewer:** A sewer that collects and transports surface runoff to a discharge point (infiltration basin, receiving stream, or treatment plant).

**Supplier of water:** Any person who owns or operates a public water system.

**Surface water:** All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.) and all springs, wells, or other collectors which are directly influenced by surface water (groundwater under the direct influence of surface water, or GWUDI).

**Suspended solids:** Solids that either float on the surface or are suspended in water or other liquids, and which are largely removable by laboratory filtering.

**Sustainable:** A water or wastewater system's ability to provide safe, high-quality drinking water to customers while meeting regulatory responsibilities.



**Total assets:** The sum of current assets, fixed assets, and long-term assets.

**Total debt service:** The total annual payment paid during the year by the system on borrowed funds, including principal, interest, and any reserve deposits if they were required.

**Total maximum daily load (TMDL):** A calculation of the maximum amount of a pollutant that a body of water can receive and still safely meet water quality standards.

**Transient non-community water system (TNCWS):** A non-community water system that does not serve 25 of the same nonresident persons per day for more than six months per year.

**Treated wastewater:** Wastewater that has been subjected to one or more physical, chemical, and biological processes to reduce its concentration of pollution or health hazard.

**Treatment technique:** An enforceable procedure or level of technological performance which water systems must follow to ensure control of a contaminant (specifically for microorganisms, turbidity, copper, lead, acrylamide, and epichlorohydrin).

**Trihalomethanes (THMs):** A group of four chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The trihalomethanes are chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

**Turbidity:** The cloudy appearance of water caused by the presence of suspended and colloidal matter. In the waterworks field, a turbidity measurement is used to indicate the clarity of water. Technically, turbidity is an optical property of the water based on the amount of light reflected by suspended particles. Turbidity cannot be

directly equated to suspended solids because white particles reflect more light than dark-colored particles and many small particles will reflect more light than an equivalent large particle.

**Unconfined aquifer:** An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

**U.S. Environmental Protection Agency (EPA):** The federal agency responsible for researching and setting national standards for a variety of environmental programs. The EPA works to develop and enforce regulations that implement environmental laws enacted by congress. Their website is [www.epa.gov](http://www.epa.gov).

**User fee:** A fee which is collected only from those persons who use a particular service, as opposed to one collected from the public in general. User fees generally vary in proportion to the degree of use of the service.

**Variance:** A State with primacy may relieve a public water system from a requirement respecting an MCL by granting a variance if certain conditions exist. These are: 1) the system cannot meet the MCL in spite of the application of best available treatment technology, treatment techniques or other means (taking costs into consideration), due to the characteristics of the raw water sources which are reasonably available to the system, and 2) the variance will not result in an unreasonable public health risk. A system may also be granted a variance from a specified treatment technique if it can show that, due to the nature of the system's raw water source, such treatment is not necessary to public health.

**Virus:** The smallest form of microorganisms capable of causing disease, especially those of fecal origin that is infectious to humans by waterborne transmission.

**Vulnerability assessment:** A process of determining which components of a system are



vulnerable to damage or loss in an emergency, it consists of four steps: inventory critical system components, identify vulnerabilities, identify actions to address vulnerabilities, and prioritize actions. To prioritize actions, system managers and operators must understand the relative risks to public health of the vulnerabilities identified.

**WARN:** Water and Wastewater Agency Response Networks, a voluntary network of utilities that help each other respond to and recover from emergencies.

**Wastewater:** The used water and solids from a community (including used water from industrial processes) that flow to a treatment plant. Storm water, surface water, and groundwater infiltration also may be included in the wastewater that enters a wastewater treatment plant.

**Wastewater treatment plant:** A facility that receives wastewaters (and sometimes runoff) from domestic and/or industrial sources, and by a combination of physical, chemical, and biological processes reduces (treats) the wastewaters to less harmful byproducts; also known by the acronyms STP (sewage treatment plant), and POTW (publicly-owned treatment works).

**Water audit:** A plan for tracking water from its entry to the distribution system to its exit at the point of use, to determine where system losses are occurring.

**Water loss:** The sum of apparent water losses and real water losses, which result in the production of non-revenue water.

**Water quality-based control standards:** Standards imposed when technology-based standards are not expected to provide sufficient protection for local water quality, given local water conditions and uses. States classify all state waters according to specific uses, and then set an ambient water quality standard to protect that use. Once the standard is set, the total maximum

daily load (TMDL) of a particular pollutant is set at a level that will not violate the standard. The TMDL is then translated into specific numerical limits in particular permits. States identify the uses, set the water quality standards, and determine how to allocate the TMDL among different users.

**Water supplier:** A person who owns or operates a public water system.

**Water supply system:** The collection, treatment, storage, and distribution of potable water from source to consumer.

**Watershed:** The land area that drains into a stream. An area of land that contributes runoff to one specific delivery point; large watersheds may be composed of several smaller “subsheds,” each of which contributes runoff to different locations that ultimately combine at a common delivery point.

**Well:** A bored, drilled, or driven shaft, or a dug hole, whose depth is greater than the largest surface dimension and whose purpose is to reach underground water supplies or oil, or to store or bury fluids below ground.

**Wellhead protection plan (WHPP):** The national Wellhead Protection Program was established by the Safe Drinking Water Act in 1986. It mandated that states develop WHPPs to protect groundwater supplies from contamination. All states except Virginia have EPA-approved WHPPs. Most states incorporate five primary elements into their plans: delineation of the wellhead protection area (WHPA), contaminant source inventory (CSI), management of the WHPA, public education and participation, and contingency planning. State WHPPs vary and may also include other elements such as a plan for new wells and groundwater, or monitoring within/near the WHPA.



# Appendices: Table of Contents

<b>A</b>	Example Standard Operating Procedures (SOPs) .....	77
<b>B</b>	Regulatory Process.....	87
<b>C</b>	Maximum Contaminant Levels (MCL) and Secondary Standards For Drinking Water	
	C1 Regulated Microorganisms in Drinking Water .....	88
	C2 Regulated Disinfection Byproducts in Drinking Water .....	89
	C3 Regulated Disinfection Chemicals in Drinking Water.....	89
	C4 Regulated Radionuclides in Drinking Water .....	89
	C5 Regulated Inorganic Chemicals in Drinking Water .....	90
	C6 Regulated Organic Chemicals in Drinking Water .....	92
<b>D</b>	NPDES Permit Testing Requirements for Publicly-Owned Treatment Works	
	D1 Effluent Parameters for All POTWs.....	96
	D2 Effluent Parameters for All POTWs with a Flow $\geq$ 0.1 MGD .....	96
	D3 Effluent Parameters for Selected POTWs: Total Recoverable Metals, Cyanide, and Total Phenols .....	97
	D4 Effluent Parameters for Selected POTWs: Volatile Organic Compounds.....	97
	D5 Effluent Parameters for Selected POTWs: Acid-Extractable Compounds .....	98
	D6 Effluent Parameters for Selected POTWs: Base-Neutral Compounds .....	99
<b>E</b>	Parliamentary Procedures at a Glance .....	100
<b>F</b>	Hiring and Terminating Employees and Sample Job Descriptions	
	F1 Hiring Employees.....	102
	F2 Terminating Employees.....	111
	Sample Job Descriptions.....	116
<b>G</b>	Sample Policy Statements	
	G1 Customer-Service Policy.....	129
	G2 Customer-Service Policy.....	134
	G3 Code of Ethics Policy.....	143
	G4 Cross-Connection Control Policy .....	145
<b>H</b>	Emergency-Response Planning .....	152
<b>I</b>	Sample Community Confidence Report (CCR).....	161
<b>J</b>	Planning .....	162

The information contained herein is for informational purposes only as a service to the public and is not legal advice or a substitute for legal counsel. As legal advice must be tailored to the specific circumstances of each case, nothing provided herein should be used as a substitute for advice of competent counsel. RCAP, Inc. expressly disclaims all liability in respect to actions taken or not taken based on any or all of the contents of this document.





# Appendix A

## Example Standard Operating Procedures (SOPs)

The document beginning on the next page is designed to serve as a tool to create standard operating procedures (SOPs) for a water association. It is not ready-to-use and should not be distributed as-is. It must be tailored to fit your water association. If you choose to adopt this document, be sure to review it carefully, **fill in all the blanks and replace all words enclosed in brackets** (example: [first name and last name]) with the required information. Ensure that all the information is pertinent to your specific water association.

### GET THIS DOCUMENT ELECTRONICALLY

This document is available electronically so you can edit it, add to it, and adapt it to your system's particular situation. Download Microsoft Word documents of these policies on the RCAP website at [www.rcap.org/boardguide](http://www.rcap.org/boardguide).

# STANDARD OPERATING PROCEDURES (SOPs) OF THE \_\_\_\_\_ WATER ASSOCIATION

## General

The information contained within this document is designed to serve as a guideline for the employees, contractors and/or board officers carrying out their duties with the association's potable water supply system. These standard operating procedures shall be adhered to, and anyone having knowledge of non-compliance must inform the board's point of contact immediately. Anyone who willingly ignores this policy or repeatedly fails to follow it may be subject to disciplinary actions or termination. The purpose of these operating procedures are to ensure that all responsible entities carry out their duties cooperatively and diligently to ensure that public health and the association's investment in its water system are protected. The Board of Directors of the \_\_\_\_\_ Water Association reserves the right to amend these procedures in any way, provided that all applicable employees and contractors are notified of any proposed changes. All applicable employees and contractors will be provided with copies of any amendments.

## I. Definitions

**Board point of contact (POC):** [first and last name] shall serve as the point of contact for the \_\_\_\_\_ Water Association's water system. Any employee, contractor, agency or other entity wishing to address the board regarding the water system must first address the board point of contact (POC) or the delegated alternate point of contact. The delegated alternate point of contact is [first and last name].

**Contract operator:** This person is responsible for ensuring that all daily operation and maintenance duties performed on the water system are in compliance with the Safe Drinking Water Act as well as any state regulations pertaining to potable water systems. The \_\_\_\_\_ Water Association is a Class \_\_\_ system and is required to employ or contract with a person having a Class \_\_\_ or higher certification.

**Contract repair service:** The contract repair service shall work under the guidance and direction of the secretary and the contract operator to ensure proper maintenance for the water system.

**Meter reader:** This person is responsible for the reading of all meters between the [number] and the [number] of each month. The meter reader shall also cut the grass at all well sites and tanks as directed by the schedule designated by the board.

**Secretary:** This person is responsible for all accounts receivable and accounts payable operations, including billing, collecting and posting customer payments, as well as posting meter readings and generating necessary accounts receivable reports. The secretary is also responsible for disbursing funds to approved claims as well as maintaining an active filing system of all correspondence, accounts receivable, and accounts payable information.

## II. Preventative Maintenance Procedures

### A. Wells, pumps, and related equipment

1. The contract operator shall personally inspect wells, pumps, and equipment and record all findings, including operating pressures, run-time meter readings, and flow-meter readings on the Daily Well Logs at least two days each week.
2. The contract operator shall initial all Daily Well Log entries as well as record the date and time of inspection in his/her state-issued Operators Log Book.
3. The contract operator shall use the Daily Well Logs to compile a Monthly Production Report.
4. The contract operator shall alert the board POC when a necessary pumping test is needed.
5. The meter reader shall perform grass-cutting services twice each month at the well site from spring until fall of each year.

### B. Tanks

1. The contract operator shall periodically make a visual inspection of the exterior of any ground storage tanks, hydropneumatic tanks, and elevated tanks for signs of paint oxidation, rust or leaks.
2. The contract operator shall alert the board POC when a necessary professional tank inspection is needed.

### C. Fire hydrants

1. The contract operator shall periodically exercise and lubricate all fire hydrants to ensure they are properly functioning.
2. The contract operator shall maintain a Fire Hydrant Drawdown and Testing Log to document each hydrant's condition and inspection history.
3. The contract operator shall use the Fire Hydrant Drawdown and Testing Log to compile the water accountability section of the Monthly Operations & Maintenance Report.

### D. Water mains

1. The contract operator shall locate and mark necessary water mains within 48 hours of receiving a request by a citizen or contractor to excavate within 10 feet of a water main or service line. The contract operator shall also document any request for line locations as well as any leaks or breaks caused by excavators and shall present this information to the board POC.
2. The secretary shall coordinate a leak-detection survey if unaccountable water loss exceeds 30 percent of the total water produced, or if it is recorded that there is a 10 percent increase in unaccountable water during a one-month period.
3. The secretary shall periodically perform visual leak inspections to ensure that unaccountable water loss is located and repairs are scheduled.

#### E. Meters and service connections

1. Each month, the meter reader shall document any indications of leaks and non-functioning meters.
2. The secretary shall periodically generate a computer report detailing possible non-functioning meters.
3. At the direction of the secretary, the contract repair service shall perform on-site meter validity inspections and necessary meter change-outs.

### III. Scheduled Maintenance Repairs

#### A. Leak repairs

1. The secretary shall contact the contract repair service for all scheduled leak repairs and obtain a preliminary estimation of the costs before proceeding with the repairs.
2. The contract repair service shall notify the secretary if the water needs to be shut off in order to complete the repairs. In turn, the secretary shall contact the contract operator to inform him/her of the temporary water outage.
3. If the main lines are cut for splicing or tie-ins, the contract operator shall personally ensure that the proper amount of HTH chlorine is poured into the main to ensure adequate disinfection. The contract repair service should flush the nearest fire hydrant down line and take a free chlorine residual test before leaving the site.
4. If the contract operator determines that a voluntary boil water notice must be issued, the secretary shall be contacted first before notifying affected customers. The contract operator will determine which method of notification is appropriate and will contact the state engineer for guidance, if necessary.
5. After bacteriological test results are reported clear by the state department of health, the contract operator shall notify the secretary to lift the boil water notice.

#### B. Equipment repairs and replacement

1. The contract operator shall notify and secure approval of the secretary before proceeding with scheduled repairs on equipment, including, but not limited to, electrical controls, well pumps and motors, and chlorine disinfection equipment.
2. The secretary shall either approve the scheduled equipment repairs or replacement or postpone them until an official decision can be made by the board.

#### C. Meter change-outs

1. The secretary shall schedule meter change-outs periodically with the contract repair service. The contract repair service shall provide documentation of the results of the on-site meter validity inspections to the secretary.

## IV. Emergency Repairs and Water Outages

- A. Emergency repairs: These are repairs that, if not completed immediately, will cause detrimental damage to the water system, cause the entire system to lose pressure, or could result in a threat to the safety and health of the town's citizens, employees or contractors.
1. The secretary shall notify the contract repair service as soon as possible regarding the extent and location of the emergency repair. The secretary shall also contact the contract operator if the area affected has lost pressure, and if so, the contract operator shall proceed with issuing a boil water notice.
  2. If the main lines are cut for splicing or tie-ins, the contract operator shall personally ensure that the proper amount of HTH chlorine is poured into the main to ensure adequate disinfection.
  3. The contract repair service shall flush the nearest fire hydrant or flush plug down line and take a free chlorine residual test before leaving the site.
  4. If a boil water notice is issued and after bacteriological test results are reported clear by the state department of health, the contract operator shall notify the board POC so that customers can be notified that the water is safe.
- B. Water outages: These involve a substantial loss of pressure on the water system due to mechanical or electrical failure or a water main break. Immediate issuance of a boil water notice is required for all water outages.
1. The secretary shall notify the contract operator immediately and give a full report of the extent of the water outage.
  2. The contract operator shall contact the state health department immediately for guidance in preparing the boil water notice.
  3. The contract operator shall be available to answer any questions that the public may have regarding the water outage, quality of water, and the necessity of the boil water notice.
  4. Once pressure is restored, the contract operator shall gather the necessary bacteriological samples and submit them immediately to the \_\_\_\_\_ County Health Department office.
  5. When the state health department has determined that the samples are clear and notifies the contract operator, the operator must notify the board POC and the affected customers that the boil water notice is lifted and the water is safe to drink.

## V. Recordkeeping

- A. Maintenance records
1. The contract operator shall:
    - a. Be responsible for maintaining a state-approved Operator Log Book detailing his/her activities. The state requires that the contract manager retain these records for at least five years.
    - b. Prepare and maintain copies of the Monthly and Annual Production Reports as well as



supply a copy to the secretary. Past Production Reports must be retained for five years.

- c. Prepare the water accountability section of the Monthly Operations & Maintenance Report and retain a copy of each report for at least five years.
- d. Prepare the Annual Operations & Maintenance Report and supply a copy to the secretary. The Annual Operations & Maintenance Report shall be retained for at least ten years.
- e. Prepare the state health department Sampling Log and retain for at least ten years.

2. The secretary shall:

- a. Prepare the state Annual Report and retain in a file for three years.
- b. Maintain copies of all reports generated by the contract operator and retain for the specified time periods listed above.

B. State test results and correspondence

1. The contract operator shall be responsible for maintaining copies of all state correspondence, test results, sanitary surveys and annual reports.
2. The secretary shall be responsible for maintaining originals of all state correspondence, test results, sanitary surveys and annual reports.

C. Pumping test, surveys and engineering plans

1. The secretary shall maintain all well pumping test reports, camera surveys, professional leak detection surveys, and as-built engineering plans.

D. Bookkeeping records

1. The secretary shall retain all water customer receipt books for at least three years.
2. The secretary shall retain all cut-off reports, aged-account reports, and billing registers for at least two years.
3. The secretary shall retain all month-ending detailed transaction reports for at least three years.
4. The secretary shall retain all daily-payment transaction reports for at least two years.
5. The secretary shall retain all IRS 940, 941, and 1040 forms prepared by the accountant and other reports and official correspondence for at least seven years.
6. The secretary shall prepare monthly bank-reconciliation reports and check-disbursement journals and retain them for at least seven years.

E. Customer files and records

1. The secretary shall maintain files for all customers and place all user agreements, state notices of intent, hardship payment plans, payment-extension agreements and any correspondence within these files. The customer files shall not be purged or archived unless directed by the board of directors.

F. Correspondence files

1. The secretary shall maintain separate files for all mortgage holders and regulatory agencies and shall file all correspondence received as well as copies of all correspondence mailed to these agencies. These official correspondence files shall not be purged or archived unless directed by the board of directors.
- G. Personnel records
1. The secretary shall maintain the individual personnel files for the secretary, the contract operator, and the contract meter reader. Included in these files will be copies of the actual contracts, State Annual Operating Agreements, and certification of insurance.
- H. Insurance policies and records
1. The secretary shall retain all commercial insurance policy files and correspondence relating to coverage of the water system for at least seven years.

## VI. Testing and Monitoring

### A. Chlorine residual tests

1. Twice each week the contract operator shall randomly check the total and free chlorine residuals at sites approved by the state department of health.
  - a. The contract operator shall document the chlorine residual test results on the Chlorine Testing and Hydrant Flushing Log.
    - i. If the free chlorine residual is tested as 0.5 mg/l or less, the contract operator shall take the necessary steps to increase the free chlorine residual, including adjusting the chlorine feed rate and flushing.

### B. Bacteriological tests

1. The contract operator shall collect the monthly bacteriological samples at state-approved sampling sites and deliver them to the \_\_\_\_\_ County Health Department on or before the deadline each month.
  - a. The contract operator shall make copies of the test results to be retained in his files and notify the secretary immediately upon receipt of the results. The board secretary shall maintain a file of the original bacteriological tests results. The contract operator shall maintain a file of copies of the tests results.
  - b. If the test results indicate a presence of coliform bacteria, indicate confluent growth, or are in any way not satisfactory, the contract operator shall contact the secretary and the state regional engineer and take the immediate necessary actions prescribed by the state department of health, including public notification and resampling procedures.
2. The contract operator shall collect bacteriological samples on the resample card should s/he suspect contamination at any time. The contract operator shall contact the state regional engineer immediately and submit the sample(s) to the \_\_\_\_\_ County Health Department. Voluntary public notification and boil water notices will be issued to those affected.

C. Other required testing, reporting, and monitoring

1. All other required testing, reporting, and monitoring specified by the Safe Drinking Water Act and/or directed by the state department of public health shall be completed by the Contract Operator following the state-prescribed guidelines and by the date that such testing, reporting, or monitoring is specified.
  - a. Upon receipt of any official correspondence from the state department of health or EPA, the contract operator shall contact the secretary immediately. The secretary shall maintain files of all original correspondence and tests results. The contract operator shall maintain alternate files of copies of such correspondence and test results.
  - b. If the \_\_\_\_\_ Water Association has been found to be in noncompliance with the Safe Drinking Water Act due to monitoring violations or exceeding maximum contaminant level standards, the contract operator shall contact the secretary and the state department of health regional engineer immediately.

## VII. Accounts Receivable and Accounts Payable Operations

A. Accounts receivable operations

1. The secretary shall refer to and strictly adhere to compliance with \_\_\_\_\_ Water Association's Bylaws and Customer-service policy concerning accounts receivable operations.

B. Accounts payable operations

1. Each month, the secretary shall compile all vendor claims, including invoices and statements, and prepare a claims docket to be presented to the board of directors at its monthly meeting.
2. The secretary shall prepare all checks for approval, signature, and disbursement prior to each monthly meeting.
3. The secretary shall mail all checks to the appropriate vendors following approval of claims the next business day after each board meeting.
4. The secretary shall prepare checks for mortgage notes and electrical utility bills and mail within five days prior to the due date. These are the only disbursements that have been granted pre-approval.

## VIII. Meter Installations, Service Extensions, Connection of New Customers

- A. The secretary shall refer to and strictly adhere to compliance with \_\_\_\_\_ Water Association's customer-service policy (service-extension policy) when accepting applications and/or requests for new customer service.
- B. If \_\_\_\_\_ Water Association has been officially notified by the state department of health or any other regulatory agency that it is not permitted to add any new customers, the secretary shall provide a copy of the official letter or administrative order to the



applicant along with an explanation of what steps the board is taking to correct the situation. Under no circumstances shall the secretary accept monies or complete a user agreement if such an order has been issued. However, the secretary shall document any and all applicants that have been denied water service.

- C. The secretary shall deposit all membership, deposit, and connection fees into the appropriate bank accounts of the association before the end of the month for all user agreements completed within the month.
- D. The secretary shall attach the original state department of health Notice of Intent or Affidavit Waiver to the user sgreement and shall file it in the customer's file.

## IX. Reporting

- A. The secretary shall make a report to the board each month at the \_\_\_\_\_ Water Association's scheduled meeting concerning maintenance, compliance, and finances of the system. The secretary shall present the Monthly Operations & Maintenance Report as well as financial records to the board.
- B. Periodically, the contract operator shall give the board an update of results for compliance with the Safe Drinking Water Act and concerns and recommendations that s/he may have regarding problems that may cause the system to be in noncompliance.
- C. The board secretary shall present all pending claims, including invoices, statements, and a claims docket, to the board at the monthly business meeting.

### **Acknowledgement of Receipt and Understanding of the \_\_\_\_\_ Water Association Standard Operating Procedures**

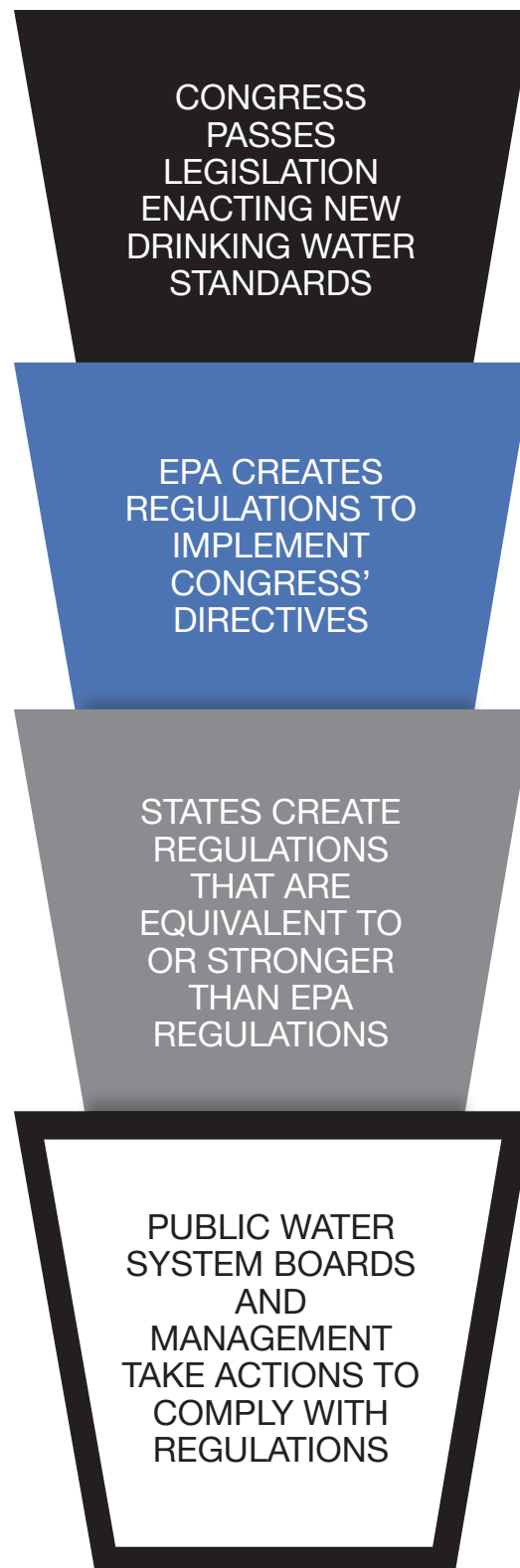
I, **[first and last name]**, hereby acknowledge that I have been given a copy of the \_\_\_\_\_ Water Association Standard Operating Procedures. I also acknowledge that I have read the SOP and fully understand my duties contained herein.

Date: \_\_\_\_\_



# Appendix B

## Regulatory Process



Graphic courtesy of Environmental Finance Center, Boise State University. Taken from Drinking Water System Management Handbook: Administration of a Drinking Water System Through Technical, Managerial and Financial Planning, February 2002, page 3.

# Appendix C

## Maximum Contaminant Levels (MCL) and Secondary Standards for Drinking Water

This information was taken from the website of the U.S. Environmental Protection Agency—*National Primary Drinking Water Regulations* at <http://water.epa.gov/drink/contaminants/index.cfm#List> (as of Oct. 18, 2010). This information is subject to change as new regulations are passed. Be sure to consult with your regulatory agency for the latest information.

### C1 Regulated Microorganisms in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
<i>Cryptosporidium</i>	TT	Gastrointestinal illness (diarrhea, vomiting, cramps)	Human/animal fecal matter.
<i>Giardia lamblia</i>	TT	Gastrointestinal illness (diarrhea, vomiting, cramps)	Human/animal fecal matter.
<i>Legionella</i>	TT	Legionnaires' Disease (a type of pneumonia)	Found naturally in water.
Enteric viruses	TT	Gastrointestinal illness (diarrhea, vomiting, cramps)	Human/animal fecal matter
Heterotrophic plate count	TT	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is assumed to be.	Found naturally in the environment.
Total coliforms	95% removal	The presence of total coliforms is used to indicate whether other potentially harmful bacteria may be present.	Most found naturally in water, but fecal coliforms and <i>E. coli</i> only come from human and animal fecal waste.
Turbidity	TT	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff.

## C2 Regulated Disinfection Byproducts in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Bromate	0.010	Increased risk of cancer.	Byproduct of disinfection.
Chlorite	1.0	Anemia; nervous system effects in infants/children	Byproduct of disinfection.
Haloacetic acids (HAA5)	0.060	Increased risk of cancer.	Byproduct of disinfection.
Total trihalomethanes (TTHM)	0.080	Liver, kidney or central nervous system problems; increased risk of cancer.	Byproduct of disinfection.

## C3 Regulated Disinfection Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Chloramines (as Cl <sub>2</sub> )	4.0	Eye/nose irritation; stomach discomfort, anemia	Disinfection chemical.
Chlorine (as Cl <sub>2</sub> )	4.0	Eye/nose irritation; stomach discomfort, anemia.	Disinfection chemical.
Chlorine dioxide (as ClO <sub>2</sub> )	0.8	Anemia; nervous system effects in infants/children.	Disinfection chemical.

## C4 Regulated Radionuclides in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Alpha particles	15 picoCuries per Liter (pCi/L)	Increased risk of cancer.	Erosion of natural deposits.
Beta particles and photon emitters	4 millirems per year	Increased risk of cancer.	Decay of natural and man-made deposits of radioactive minerals.
Radium 226/228	5 pCi/L	Increased risk of cancer.	Erosion of natural deposits.
Uranium	30 µg/L	Increased risk of cancer, kidney toxicity.	Erosion of natural deposits.

## C5 Regulated Inorganic Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar.	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	0.010	Non-cancer effects: thickening and discoloration of the skin, stomach pain, nausea, vomiting; diarrhea; numbness in hands and feet; partial paralysis; and blindness. Increased risk of cancer of the bladder, lungs, skin, kidney, nasal passages, liver, and prostate.	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes
Asbestos (>10 µm)	7 million fibers/Liter	Increased risk of developing benign intestinal polyps.	Decay of asbestos cement in water mains; erosion of natural deposits
Barium	2	Increase in blood pressure.	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.
Beryllium	0.004	Intestinal lesions.	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries.
Cadmium	0.005	Kidney damage.	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints.
Chromium (total)	0.1	Allergic dermatitis.	Discharge from steel and pulp mills; erosion of natural deposits.
Copper	TT; Action Level=1.3	Short-term exposure: gastrointestinal distress. Long-term exposure: liver or kidney damage; people with Wilson's Disease should consult their doctor if the amount of copper in their water exceeds the action level.	Corrosion of household plumbing systems; erosion of natural deposits.
Cyanide (as free Cn)	0.2	Nerve damage or thyroid problems.	Discharge from steel or metal factories; discharge from plastic and fertilizer factories.

## C5 Regulated Inorganic Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Fluoride	4.0	Bone disease (pain and tenderness of the bones); children may get mottled teeth.	Water additive; erosion of natural deposits; discharge from fertilizer and aluminum factories.
Lead	TT; Action Level=0.015	Infants and children: delays in physical or mental development; children could show slight deficits in attention span and learning abilities. Adults: kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits.
Mercury	0.002	Kidney damage.	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands.
Nitrate (as N)	10	Infants below the age of 6 months could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Nitrite (as N)	1	Infants below the age of 6 months could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits.
Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems.	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines.
Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems.	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories.

## C6 Regulated Organic Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Acrylamide	TT	Nervous system or blood problems; increased risk of cancer.	Added to water during sewage/ wastewater treatment.
Alachlor	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer.	Runoff from herbicide used on row crops.
Atrazine	0.003	Cardiovascular system or reproductive problems.	Runoff from herbicide used on row crops.
Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer.	Discharge from factories; leaching from gas storage tanks and landfills.
Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer.	Leaching from linings of water storage tanks and distribution lines.
Carbofuran	0.04	Problems with blood, nervous system, or reproductive system.	Leaching of soil fumigant used on rice and alfalfa.
Carbon tetrachloride	0.005	Liver problems; increased risk of cancer.	Discharge from chemical plants and other industrial activities.
Chlordane	0.002	Liver or nervous system problems; increased risk of cancer.	Residue of banned termiticide.
Chlorobenzene	0.1	Liver or kidney problems.	Discharge from chemical and agricultural chemical factories.
2,4-D	0.07	Kidney, liver, or adrenal gland problems.	Runoff from herbicide used on row crops.
Dalapon	0.2	Minor kidney changes.	Runoff from herbicide used on rights of way.
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems.	Discharge from industrial chemical factories.
p-Dichlorobenzene	0.075	Anemia; liver, kidney or spleen damage; changes in blood.	Discharge from industrial chemical factories.
1,2-Dichloroethane	0.005	Increased risk of cancer.	Discharge from industrial chemical factories.



## C6 Regulated Organic Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
1,1-Dichloroethylene	0.007	Liver problems.	Discharge from industrial chemical factories.
cis-1,2-Dichloroethylene	0.07	Liver problems.	Discharge from industrial chemical factories.
trans-1,2-Dichloroethylene	0.01	Liver problems.	Discharge from industrial chemical factories.
Dichloromethane	0.005	Liver problems; increased risk of cancer.	Discharge from drug and chemical factories.
1,2-Dichloropropane	0.005	Increased risk of cancer.	Discharge from industrial chemical factories.
Di(2-ethylhexyl) adipate	0.4	Weight loss, liver problems, or possible reproductive difficulties.	Discharge from chemical factories.
Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer.	Discharge from rubber and chemical factories.
Dinoseb	0.007	Reproductive difficulties.	Runoff from herbicide used on soybeans and vegetables.
Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer.	Emissions from waste incineration and other combustion; discharge from chemical factories.
Diquat	0.02	Cataracts.	Runoff from herbicide use.
Endothall	0.1	Stomach and intestinal problems.	Runoff from herbicide use.
Endrin	0.002	Liver problems.	Residue of banned insecticide.
Epichlorohydrin	TT	Increased cancer risk, and over a long period of time, stomach problems.	Discharge from industrial chemical factories; an impurity of some water treatment chemicals.
Ethylbenzene	0.7	Liver or kidney problems.	Discharge from petroleum refineries.
Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer.	Discharge from petroleum refineries.
Glyphosate	0.7	Kidney problems; reproductive difficulties.	Runoff from herbicide use.
Heptachlor	0.0004	Liver damage; increased risk of cancer.	Residue of banned termiticide.
Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer.	Breakdown of heptachlor.



## C6 Regulated Organic Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer.	Discharge from metal refineries and agricultural chemical factories.
Hexachlorocyclopentadiene	0.05	Kidney or stomach problems.	Discharge from chemical factories.
Lindane	0.0002	Liver or kidney problems.	Runoff/leaching from insecticide used on cattle, lumber, gardens.
Methoxychlor	0.04	Reproductive difficulties.	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.
Oxamyl (Vidate)	0.2	Slight nervous system effects.	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes.
Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer.	Runoff from landfills; discharge of waste chemicals.
Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk.	Discharge from wood-preserving factories.
Picloram	0.5	Liver problems.	Herbicide runoff.
Simazine	0.004	Problems with blood.	Herbicide runoff.
Styrene	0.1	Liver, kidney, or circulatory system problems.	Discharge from rubber and plastic factories; leaching from landfills.
Tetrachloroethylene	0.005	Liver problems; increased risk of cancer.	Discharge from factories and dry cleaners.
Tolulene	1	Nervous system, kidney, or liver problems.	Discharge from petroleum factories.
Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer.	Runoff/leaching from insecticide used on cotton and cattle.
2,4,5-TP (Silvex)	0.05	Liver problems.	Residue of banned herbicide.
1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands.	Discharge from textile finishing factories.

## C6 Regulated Organic Chemicals in Drinking Water

CONTAMINANT	MCL OR TT (MG/L)	POTENTIAL HEALTH EFFECT FROM LONG-TERM EXPOSURE	SOURCE OF CONTAMINANT
1,1,1-Trichloroethane	0.2	Liver, nervous system or circulatory problems.	Discharge from metal degreasing sites and other factories.
1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems.	Discharge from industrial chemical factories.
Trichloroethylene	0.005	Liver problems; increased risk of cancer.	Discharge from metal degreasing sites and other factories.
Vinyl chloride	0.002	Increased risk of cancer.	Leaching from PVC pipes; discharge from plastic factories.
Xylenes (total)	10	Nervous system damage.	Discharge from petroleum factories and chemical factories.

# Appendix D

## NPDES Permit-testing Requirements for Publicly Owned Treatment Works

This information was taken from the website of the U.S. Environmental Protection Agency—Title 40—Protection of the Environment, Part 122--EPA-Administered Permit Programs: The National Pollutant Discharge Elimination System, Subpart D—Transfer, Modification, Revocation and Reissuance, and Termination of Permits, Appendix J: NPDES Permit Testing Requirements for Publicly Owned Treatment Works, at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=59812647591e8d8a62c5b5b90ad42f55&rgn=div9&view=text&node=40:22.0.1.1.12.4.6.5.17&idno=40> (as of October 2011). This information is subject to change as new regulations are passed. Be sure to consult with your regulatory agency for the latest information.

### D1 Effluent parameters for all POTWs

PARAMETER	PARAMETER
Biochemical oxygen demand (BOD-5 or CBOD-5)	pH
Fecal coliform	Total suspended solids
Design flow rate	Temperature

### D2 Effluent parameters for all POTWs with a flow $\geq 0.1$ MGD

PARAMETER	PARAMETER
Ammonia (as nitrogen)	Kjeldahl nitrogen
Chlorine (total residual)	Oil and grease
Dissolved oxygen	Phosphorus
Nitrate/nitrite	Total dissolved solids

## D3 Effluent parameters for selected POTWs: total recoverable metals, cyanide and total phenols

PARAMETER	PARAMETER
Hardness	Mercury
Antimony	Nickel
Arsenic	Selenium
Beryllium	Silver
Cadmium	Thallium
Chromium	Zinc
Copper	Cyanide
Lead	Total phenolic compounds

## D4 Effluent parameters for selected POTWs: volatile organic compounds

PARAMETER	PARAMETER
Acrolein	1,1-Dichloroethylene
Acrylonitrile	1,2-Dichloropropane
Benzene	1,3-Dichloropropylene
Bromoform	Ethylbenzene
Carbon tetrachloride	Methyl bromide
Chlorobenzene	Methyl chloride
Chlorodibromomethane	Methylene chloride
Chloroethane	1,1,2,2-Tetrachloroethane
2-Chloroethylvinyl ether	Tetrachloroethylene
Chloroform	Toluene
Dichlorobromomethane	1,1,1-Trichloroethane
1,1-Dichloroethane	1,1,2-Trichloroethane
1,2-Dichloroethane	Trichloroethylene
Trans-1,2-dichloroethylene	Vinyl chloride

## D5 Effluent parameters for selected POTWs: acid-extractable compounds

PARAMETER	PARAMETER
P-chloro-m-creso	2-nitrophenol
2-chlorophenol	4-nitrophenol
2,4-dichlorophenol	Pentachlorophenol
2,4-dimethylphenol	Phenol
4,6-dinitro-o-cresol	2,4,6-trichlorophenol
2,4-dinitrophenol	

## D6 Effluent parameters for selected POTWs: base-neutral compounds

PARAMETER	PARAMETER
Acenaphthene	1,4-Dichlorobenzene
Acenaphthylene	3,3-Dichlorobenzidine
Anthracene	Diethyl phthalate
Benzidine	Dimethyl phthalate
Benzo(a)anthracene	2,4-Dinitrotoluene
Benzo(a)pyrene	2,6-Dinitrotoluene
3,4-Benzofluoranthene	1,2-Diphenylhydrazine
Benzo(ghi)perylene	Fluoranthene
Benzo(k)fluoranthene	Fluorene
Bis (2-chloroethoxy) methane	Hexachlorobenzene
Bis (2-chloroethyl) ether	Hexachlorobutadiene
Bis (2-chloroisopropyl) ether	Hexachlorocyclo-pentadiene
Bis (2-ethylhexyl) phthalate	Hexachloroethane
4-Bromophenyl phenyl ether	Indeno(1,2,3-cd)pyrene
Butyl benzyl phthalate	Isophorone
2-Chloronaphthalene	Naphthalene
4-Chlorophenyl phenyl ether	Nitrobenzene
Chrysene	N-nitrosodi-n-propylamine
Di-n-butyl phthalate	N-nitrosodimethylamine
Di-n-octyl phthalate	N-nitrosodiphenylamine
Dibenzo(a,h)anthracene	Phenanthrene
1,2-Dichlorobenzene	Pyrene
1,3-Dichlorobenzene	1,2,4,-Trichlorobenzene

# Appendix E

## Parliamentary Procedures At A Glance

The motions below are listed in established order or precedence. When any motion is pending, you may *not* introduce another motion listed below it, but you *may* introduce another motion listed above it.

MOTION	WHAT YOU SAY	INTERRUPT SPEAKER?	SECONDED?	DEBATABLE?	AMENDABLE?	VOTE REQUIRED
Adjourn the meeting	"I move that we adjourn."	No	Yes	No	No	Majority
Recess the meeting	"I move that we recess until..."	No	Yes	No	Yes	Majority
Complain about noise, room, etc.	"Point of privilege."	Yes	No	Resulting motion debatable	No	None (Chair decides)
Suspend further consideration	"I move we table..."	No	Yes	No	No	Majority
End debate	"I move the previous question."	No	Yes	Yes	Yes	Two-thirds
Postpone further consideration	"I move we postpone this matter until..."	No	Yes	Yes	Yes	Two-thirds
Have something studied further	"I move we refer this matter to a committee."	No	Yes	Yes	Yes	Majority
Amend a motion	"I move that this motion be amended by..."	No	Yes	Yes	Yes	Majority
Introduce business	"I move that..."	No	Yes	Yes	Yes	Majority



The motions below have *no* established order or precedence. You may introduce any of them at any time, *except* when the meeting is considering a motion to adjourn, a motion to recess, or a point of privilege.

MOTION	WHAT YOU SAY	INTERRUPT SPEAKER?	SECONDED?	DEBATABLE?	AMENDABLE?	VOTE REQUIRED
Object to procedure or to personal affront	“Point of order.”	Yes	No	No	No	None (Chair decides)
Request information	“Point of information.”	Yes (if urgent)	No	No	No	None
Verify voice vote by actual count	“I call for a division of the house.”	No, but must occur before another motion is made	No	No	No	None unless someone objects; then majority
Object to undiplomatic or improper matter	“I object to consideration of...”	Yes	No	No	No	Two-thirds
Take up a matter previously tabled	“I move we take from the table...”	No	Yes	No	No	Majority
Reconsider something already disposed of	“I move we reconsider our action relative to...”	Yes	Yes	Yes, if original motion is debatable	No	Majority
Consider something out of its scheduled order	“I move we suspend the rules and consider...”	No	Yes	No	No	Two-thirds
Vote on a ruling by the chair	“I appeal the chair’s decision.”	Yes	Yes	Yes	No	Majority to reverse Chair’s decision

© Public Management Institute



# Appendix F

## Hiring And Terminating Employees And Sample Job Descriptions

### F1 Hiring Employees

Few tasks are as important as identifying and hiring new employees. Hiring the right person the first time is much easier than having to fire an employee who did not meet expectations and then having to refill the position. Finding the right person with all of the necessary qualifications is becoming more difficult in the utility industry. Fewer young people are entering the field, salaries are increasing, new regulations are constantly being adopted, and the responsibilities associated with operating a water or wastewater utility are becoming more complex each year.

Following is guidance on the procedures and legal requirements associated with hiring an employee.

#### Identify your needs

Whether filling a vacant position or creating a new position, the first step should be to know the duties and responsibilities of the person holding the job. Usually this means refining or creating a job description. When hiring someone, it is important to know what is expected to be accomplished by the person in that position. Those expectations should be placed in a written job description.

#### Writing job descriptions

Writing job descriptions is one of those tasks that is easy to just put off to another day. After all, the

employees are all working hard and in many cases doing more than expected. Yet having carefully prepared and updated job descriptions are a benefit to both the employee and the utility.

Ideally a job description provides a means for the utility to present its vision, goals and strategy to a prospective employee. Even the smallest utility and its governing body have a vision and goals. Sometimes these goals or long-range plans are not fully developed or are in the process of change. However, as the utility looks to hire new staff or replace departing staff, there is a real need to be able to identify prospective employees who share the utility's vision and goals, agree to help devise or follow that strategy, and accept the responsibilities in the job description. The written job description is one of the best ways to effectively move the utility toward meeting its goals by identifying the skills and expertise that are required to do this.

The job description describes what the prospective employee, if hired, will be expected to deliver. Having a written position description before beginning to interview potential candidates gives both the utility and the candidate a guide to preparing a list of questions to ask during an interview. For the utility, the description helps to evaluate and select candidates by comparing their answers to questions and later to provide criteria for evaluating the employee's performance.

A job description provides a way to quantify and compare what was expected from the employee and what level of performance was

actually achieved. When reviewing performance, if the person hired has not been able to deliver on one or more of the responsibilities, the appropriate assistance can be provided to improve performance, or the person can be terminated. Providing assistance to correct shortcomings is preferable and in the long run the most economical personnel-management activity. Turnover is very expensive and time-consuming. It can adversely affect your other employees who have to pick up the slack for the terminated employee. The continual retraining of new employees can be time-consuming and reduce the ability of the trainer to continue to perform his or her required functions. Therefore, finding the right person who can fulfill the duties and responsibilities of the position as detailed in the job description is an important management function.

Of equal importance, job descriptions increase organizational effectiveness by making sure that essential tasks and duties fall within the correct positions and are not duplicated unnecessarily. They can also help ensure that employees are aware of reporting and supervisory responsibilities by laying out a “chain of command.” For utilities, the need to detail important operational responsibilities that directly affect service levels (and ultimately public health) cannot be overemphasized. For instance, who is responsible for checking and maintaining required chlorine residuals in the distribution systems; who is responsible for maintaining an adequate inventory of necessary chemicals and repair parts; who is responsible for backwashing filters (and when); who is responsible for completing the monthly operating reports; who is responsible for preparing customers’ bills and collecting payments; who is responsible for answering the phone; and on and on. If these are not in writing and there is a major error in your operational or administrative processes or procedures, it may be difficult to assign responsibility and determine how better to

structure the work of your employees so that there will not be a reoccurrence of the problem.

## What is a job description?

A job description is a formal statement of the duties, responsibilities and qualifications of a position based on information obtained through an objective job analysis. Its purpose is to identify a specific job with clarity and precision and to describe its scope and content. It may include information on working conditions, tools, equipment used, knowledge and skills needed to do the job, and relationships with other positions and employees. It should be accurate, concise and comprehensive. Finally, a job description should be viewed as an important management tool and not just another paperwork requirement.

## Job descriptions for existing employees

Job descriptions are just as critical for existing positions that have no written job description associated with them. It is important to stress that these be written job description because unwritten job descriptions do not count. Many employers claim they have job descriptions but later reveal that the position and its responsibilities exist only within the heads of their managers and/or themselves. Job descriptions are also needed for job duties that are shuffled between job positions, when a utility transforms and changes a position’s duties and responsibilities, and when staff numbers are being reduced but the workload remains the same. Of course, they are equally important for existing positions that have no job description linked to them, as they aid in personnel management, performance evaluation, employee recognition and compensation.

Job descriptions require the involvement of the managers, other supervisory personnel, and the



person currently in the position (if applicable). At times, they may need the general manager's or board's final input/review.

One of the primary purposes of a job description is to identify the essential functions of the position. According to the Equal Employment Opportunity Commission (EEOC), essential functions are those tasks or functions of a particular position that are fundamental to the position (as opposed to marginal). Knowing the essential functions of the job will also help you in:

- writing appropriate interview questions
- determining whether a person is qualified to perform the essential functions
- identifying reasonable accommodations to enable a disabled person to perform the essential functions

## What are essential functions?

In identifying essential functions, be sure to consider: 1) whether employees in the position actually are required to perform the function; and 2) whether removing that function would fundamentally change the job.

The Americans with Disabilities Act of 1990, which brought the idea of essential functions into focus, lists several reasons a function could be considered essential:

- The position exists to perform the function (for example, if someone is hired to read meters, the ability to take a reading from a water meter is an essential function, since this is the reason that the position exists).
- There are a limited number of other employees available to perform the function, or among whom the function can be distributed (for example, it may be an essential function for the office manager to answer the telephone if there are only two or three employees in your office,

and each employee has to perform many different tasks).

- A function is highly specialized, and the person in the position is hired for special expertise or ability to perform it (for example, a surface water treatment plant that by rule requires an operator with a B Surface Water license—therefore an essential function would be performing those tasks as basic functions of an operator with this level of certification).

To identify the essential functions of the job, first identify the primary purpose of the job, and the importance of actual job functions in achieving this purpose. In evaluating the “importance” of job functions, consider, among other things, the frequency with which a function is performed, the amount of time spent on the function, and the consequences if the function is not performed. The EEOC considers various forms of evidence to determine whether or not a particular function is essential. These include, but are not limited to:

- the employer's judgment
- the amount of time spent on the job performing that function
- the availability of others to fill in for the person who performs that function

In defining the essential functions of a job, it is important to distinguish between methods and results. While essential functions need to be performed, they often do not need to be performed in one particular manner (unless doing otherwise would create an undue hardship).

## Basic elements of a job description

Writing a job description should not be difficult. Some basic components should exist in the job description. These are:

1. position title



2. place within the organization (department, division, etc.)
3. reporting structure
4. position overview or summary/purpose of the position
5. essential duties and responsibilities/accountability
6. essential job requirements
  - education
  - experience
  - skills
  - knowledge
  - qualities/qualifications
  - physical requirements

To be able to track periodic changes in the job description, date documents with a revision date and indicate who prepared it. These essential elements can be added to the document's footer.

## Tips on writing effective job descriptions

In order to write an effective job description, there are a few tips to keep in mind:

1. If someone is currently doing the job, start with his or her input. This includes gathering input on the right way to perform a job responsibility and the wrong way. Try to make sure the comments will give you answers on qualities, competencies, qualifications, and requirements for the position. For each requirement, start with an action verb (some examples include *oversees*, *monitors* and *maintains*). If the employee in the position has trouble formulating a list of duties, have him or her try keeping a log of what he or she does for a week or two. Tasks from this log can then be grouped by similarity and formed into a list of responsibilities. When finished writing the preliminary job description, have someone else review it and then have the principals involved (position supervisor, senior management, or board) review it.
2. Compare the job description against other, similar positions to ensure that tasks are specific and are not unnecessarily duplicated among positions.
3. Make job functions and requirements as specific as possible. The more specific the job requirements, the less likely someone will claim they meet all of the requirements. This helps differentiate candidates. This also helps later in performance appraisals, as the person doing the job will most likely see areas where he or she can improve.
4. Use everyday English so employees and managers will understand clearly what is required. It is important to keep the job description to no more than two pages, if possible. While upper-management positions might have longer job descriptions, the length of the job description does not equate to the amount of compensation. Include only meaningful statements that clearly define the requirements and communicate expected performance outcomes in the job description (not just a bunch of tasks).
5. Determine if there are any special circumstances related to the position, such as physical, environmental or other special demands. Also, if a job is performed by multiple staff members, incorporate the principle elements into a single generic job description and avoid specifying minor differences in the way the work might be performed.



6. Eliminate any discriminatory language, and maintain flexibility. Ensuring legal compliance is necessary in most documents, and a job description is no exception. A general statement such as, “Occasionally the employee will be required to perform additional tasks and duties as required by the employer,” or “Other duties as assigned” should always be included in your job description. This flexibility allows the employer some legal protection should an employee ever claim that the employer changed the employee’s job responsibilities.
7. Revise the job description as the position evolves. A yearly revision at a minimum is always required. As in many other businesses, technology and practices in the water and wastewater industry are constantly changing and so too are jobs and the work needed to perform.

Finally, job descriptions should always be kept in your permanent files so positions can be easily reviewed and compared. It is also a good practice to put a copy in the employee’s personnel file so that at appraisal time the document can be reviewed.

Sample job descriptions are included at the end of this section. Review this material when considering a new hire.

## Finding potential employees

Once the required skills and expertise for a position have been established, potential employees that possess these qualities must be found. Review your utility’s conflict of interest policy to ensure that individuals who pose a potential conflict of interest are not considered for the position.

Remember that employees are the most important part of a utility. Hire someone who fits the job

description as described above and who will work well with other employees. Finding someone with a stable work record who will remain in employment for a long period is important, because the cost of training new employees is considerable. Some areas to consider when looking for a new employee include:

- Don’t “steal” employees from a neighboring system, but use this informal network to advertise an open position.
- Use the state’s workforce or employment website.
- Access private job sites on the Internet for a relatively low cost.
- Local or regional newspapers often have searchable databases for employers.
- Consider advertising the open position in local newspapers.
- Trade journals are targeted publications that go directly to the type of workers for the position and are especially good when looking for someone with specific utility experience, such as licensed water and wastewater operators.
- Local community colleges or university career-services offices may list positions for which their students and alumni can apply.
- Local and industry job fairs or trade shows can be used to gather great leads on candidates.

The law does not require private employers to advertise for open positions. However, there are two very compelling reasons for advertising:

- A larger pool of applicants is available from which to choose the new employee, increasing the chances of finding the right person for the job.
- Unintentional discrimination is avoided. If word of mouth is the sole method for information on new hires, then the hiring



process may be discriminatory, even though that is not the intention.

When writing a job advertisement for a major newspaper, being brief is important. If the ad is for a posting elsewhere, it can be more descriptive. First, title the job ad with a descriptive title that will catch the attention of potential applicants. Next, if there are any specific skills or education that are mandatory, list those clearly, such as, "Requires B surface water license." If a broad description about the job is used, more responses may be submitted, but it will also be more time-consuming to sort through all of them. State how the candidate should respond (resume, letter of interest, etc.) and to whom. It is also advisable to have a date after which applications will not be accepted.

## Reviewing resumes and applications

Resumes include only the information the applicant wants to present about himself or herself. An application asks for the information *you* want to have.

Evaluating applicants based solely on their resumes or applications can be difficult. It can be tempting to make comparisons between the interviewer's and the applicant's educational background, where the applicant grew up, whether the applicant has worked for cities, districts or WSCs, or whether the applicant has served in the military. Trying to be impartial to these types of experiences means more successful hiring.

What is important to look for in a resume?

- One of the first things to notice is the overall appearance of the resume. Does it have a professional appearance? Is it neatly presented? Are there spelling or grammar errors? Is it up-to-date? While the resume does not have to be professionally printed on

expensive paper, you should look for neatness and attention to detail.

- When looking at an applicant's educational background, keep in mind what skills are required for the position. For an operator's position, it is necessary to have a high school diploma or the equivalent, but some college-level courses, especially in technical areas, may be an indication of the applicant's motivation and ability to understand more complex treatment or process-control procedures. For management positions, college-level course work in business, accounting or management can be another good indicator of potential performance. In most cases, the focus should be on the work experience of the applicant.

When reviewing the applicant's past work experience, look for the following:

- actual responsibilities, as opposed to titles
- duties, as opposed to responsibilities (Do these correspond to each other? For example, someone may have managed a surface water treatment plant without having ever having backwashed a filter or performed a jar test.)
- specific accomplishments, such as goals met or exceeded, awards won, or special projects assigned and successfully completed
- the length of time the positions or titles were held (Was the applicant in a position long enough to have the experience needed? Why did he or she leave that position?)
- the progression of work experience (Does his or her experience show increasing levels of skill and/or responsibility? Is there any significant backtracking? Or is there no real change in the level of the responsibility or job duties? This may indicate a lack of ambition or desire to achieve.)

- unexplained gaps in the work history

Make notes about any questions you have, particularly about actual skills, job changes, lack of advancement, or other areas you think are important.

The cover letter or letter of interest is also a good way to evaluate the person who wrote it. Require that such a letter be submitted with the resume. Many times the effort shown in preparing such letters can make the difference in whether the applicant is interviewed or not. The cover letter should at least mention the requirements and responsibilities of the position you are filling, and hopefully the utility by name as well. Be wary if it is a standard letter template used to drop in utility names and job titles, of which yours is simply one of many. This lack of customization may show a lack of true interest in the position. Look for statements that show sincere interest, signs of research and knowledge about the organization and the position, as well as good grammar and communication skills.

## Conducting interviews

Preparation is the key to a successful interview. A simple conversational interview where experiences are discussed or war stories exchanged won't give the real information needed. Preparation should mean developing a set of standard questions that are followed with each candidate, some sort of rating system to objectively compare candidates (very important if more than one interview is conducted each day), and the commitment and ability to evaluate applicants without having any preconceived biases.

It is especially important to control personal biases regarding different types of applicants. Only the experience and skills of the applicant should be evaluated and whether he or she can contribute to the utility and get the job done correctly.

Consider starting with telephone interviews, especially if there is a large number of equally qualified candidates. This can save quite a bit of time by helping narrow down the list to the most-qualified candidates. Telephone interviews are typically shorter because there are fewer formalities involved than in a face-to-face interview. With telephone interviews, it is hard to form any initial impressions based on appearance or other physical characteristics. Try to schedule the phone interview at a time that is convenient for the applicant. For example, he or she may not want to be interviewed from his or her current workplace, so an evening interview may be necessary. Try to accommodate his or her schedule, if possible.

It is just as important to have a prepared list of questions for telephone interviews as any other type of interview. This keeps the interview on track and moving along at a good pace. Keep the questions general, however, in order to keep the interview short. Save the details for the face-to-face interview. This may also be the best time to bring up the salary offered for the position to screen out applicants who require higher levels of pay.

If four or more people are employed, anti-discrimination laws must be followed during every phase of the hiring process. The federal laws, which apply to employers in all 50 states, prohibit discrimination on the basis of race, gender, pregnancy, national origin, religion, disability and age (if the person is older than 40). Generally if an employer has at least 15 employees, federal laws must be followed (although the prohibition against age discrimination only applies to employers with 20 or more employees). Federal anti-discrimination laws may be found at [www.eeoc.gov/facts/qanda.html](http://www.eeoc.gov/facts/qanda.html).

As a guideline, the following is provided for the types of questions that **should not** be asked:

- Race, age, sex, religion, and national origin. An employer may ask if an applicant is 18 years



of age or older or has a legal right to work in the United States either through citizenship or status as a resident alien.

- Marital status, maiden name, and number, names, and ages of children or other dependents.
- Employment of the spouse and child-care arrangements, unless such queries are made of both male and female applicants.
- A woman's pregnancy or related condition.
- Arrest records that did not result in convictions. It is permissible to inquire about convictions or pending felony charges.
- The existence, nature, or severity of a disability. An employer may ask about an applicant's ability to perform specific job functions.
- An applicant's height and weight, except in specific professions such as law enforcement, when guidelines have been established for various national organizations.
- Organizational affiliations, except those pertaining to professional memberships related to the specific job.
- Military history, unless the job requires such a background.
- Status as a high school graduate. It is permissible to request the applicant to supply the details of his or her educational history.
- Lowest salary acceptable for a specific position.
- How many days the applicant was sick last year.
- Any past workers' compensation claims or injury history.
- Any lawful drug use (unless it is as part of a screening for unlawful drug use).

It is easy for an uninformed interviewer to ask seemingly harmless questions that may, in fact, be

discriminatory. The main thing to keep in mind is to stay away from anything that could be construed as discriminatory. Don't even make notes about physical appearance, ethnicity, disabilities or other attributes about the candidate. If they offer such information, do not make note of it or respond to it. The rule of thumb is: If a question does not have anything to do with the job or is not vital to determining the applicant's ability to perform the responsibilities associated with the job, it should not be asked.

Before the interview, create two lists: one of all the tasks that the applicant will have to perform as part of the job and the other of all the skills and experience that are required for the position. This will help you focus on whether the applicant can do the job. At the interview, ask the applicant whether he or she will be able to perform each of the essential tasks, and ask him or her if he or she possesses the requisite skills and experience.

If these lists are used with each applicant, it is ensured that all applicants will be asked essentially the same questions. This will help avoid the appearance of treating some applicants differently from others. Establish a simple scoring system for answers to these questions concerning skills and experience to provide a means for comparing applicants.

## Deciding on the best candidate

The number of candidates and the information they provided may be overwhelming. It's not hard to be confused about who said what. Opinions about applicants may have changed as each one had an interview. This is why it is beneficial to take notes during each interview. Those notes should be written on the pages of prepared questions used during the interview.

As for references, ask for business, personal and even education references from applicants. Getting



the opinion of someone an applicant has worked for in the past can be extremely helpful. Often past employers are hesitant to say anything about a past employee for fear of lawsuits. If you do get any input from a former employer or other reference (or even if they refuse comment), document everything about the conversation and take notes about what the reference said. If you can't get in touch with the reference after several tries, make a note of that as well. This can help protect the utility from any negligent hiring suits. It's probably a good idea to keep records of notes, resumes, and other correspondence with candidates who applied for the job for at least one year.

Some references or recommendations for applicants can be found on job-networking websites, such as LinkedIn. Other information about applicants can be found elsewhere on the web. More and more employers are checking out applicants' Facebook pages and postings on social-media websites. Be cautious as these can present just one side of a person, often just the social or personal side, but sometimes just a simple search of the person's name will bring up a body of work by that person, such as articles he or she has written.

When it is time to contact the chosen candidate, more often than not this will be with a phone call. It helps to have told each applicant at the end of the interview how and approximately when to expect a hiring decision. The preferred method is to extend a verbal offer by phone and follow it up with a letter with the details of the offer, including such points as the negotiated salary, hours, and any other pertinent information. Include in the letter any contingencies, such as physical exams or drug tests. The employee should sign and return the letter as a record of his or her acceptance of the position. Give the candidate a deadline to respond. While it is important that the letter spell out some details, don't include too much in it.

Most states have an "employment at will" doctrine that means it is assumed that the position is for an indefinite amount of time and that either the employer or employee can terminate the relationship for any reason. Do not compose an offer letter as an employment contract. Here are some things to watch out for in the offer letter:

- Do not imply the permanence of the position. No one is really a permanent employee under the employment-at-will doctrine.
- Do not state the salary as a monthly figure. It is not unknown for a court to award a year's salary to an employee who was discharged within six months based on the salary figure in the offer letter. There have also been cases in which the employee had to be kept on for one year because of the way the salary was stated in the offer letter.
- Do not state specific intervals for employee performance evaluations. Courts have also held that new hires had to be kept on at least until the evaluation because it was stated that they would be "evaluated in three months" in the offer letter.
- State specifically that the offer is not an employment contract and does not spell out specific terms of employment.

Once the chosen candidate accepts employment, contact the other interviewed candidates either by phone or letter. This is important not only as a courtesy, but because at some point in time, the utility may hire those candidates. It is possible that the chosen one will change his or her mind and you'll end up calling the second choice right away. Or another position may open at a later date that one of those candidates could fill. Don't ruin the chances of getting them back by failing to let them know about the decision for the current position.

Finally, there's nothing worse for a new employee than arriving at work for his or her first



day on the job and having no one know who he or she is or why he or she is there. Make sure there is someone available to show the new employee around, answer questions, introduce him or her to staff, and get him or her started with training.

Take the time and effort to find the right employee. It's one of the most important jobs for the board, manager or supervisor. Hire the person who will perform the duties assigned in an efficient and effective manner. The alternative can be much more difficult.

## F2 Terminating Employees

Invariably the time will come when it is time to part ways with an employee. Having to fire a staff member is never an easy or pleasant task. However, there are a few procedures and practices that will help to make such an activity go as smoothly as possible. This discussion covers only involuntary terminations.

interruption of the employment due to a lack of work. If the termination is the result of a reduction in workforce (layoff), make sure that the employee's selection for termination has been fair and legal, and that the process has been documented.

### Categories of termination

Typically there are three categories of involuntary termination:

- **Poor performance:** When an employee consistently has exhibited performance below established performance criteria. When terminating an employee for poor performance, be certain to document that the employee had been advised of performance deficiencies, given a reasonable amount of time to correct the deficiencies, and that the employee has failed to make the necessary corrections.
- **Termination for cause:** When an employee's conduct is in serious violation of company policy or the employee has acted in a manner that significantly jeopardizes the utility or his or her fellow employees. When terminating for cause, be sure the employee's action is thoroughly documented.
- **Reduction in force (layoff):** A temporary

### Importance of written policies and procedures

Reserve the right to terminate employees at will with the backing of written policies and procedures. To accomplish this, review all application forms, offer letters, employment contracts, employee handbooks, personnel policies, manuals and termination documents to ensure they do not contain any promises of employment for a specific or definite period of time or promises of job security. Make sure there are no statements that say employment lasts "as long as performance is satisfactory" or something similar. All such documents, if possible, should contain an at-will employment statement.

Develop reasonable standards of conduct that include performance and behavior standards, and provide them to your employees in writing. They should be in simple, straightforward language that leaves no room for interpretation. Have employees sign an acknowledgment that they are aware of and have read company policies and standards



of conduct, that they agree to follow the rules established, and that failure to follow such rules can lead to discipline up to and including termination. Enforce these standards consistently and uniformly. Document employee problems to ensure that termination does not come as a surprise.

If exceptions to the rules are made as a matter of course, the rules should be changed. A good rule of thumb: If there is no paper (documentation) in the file, the (mis)conduct did not occur.

It is also advisable to have a performance-evaluation policy and/or a disciplinary policy. Regular performance evaluations are important to communicate to the employee what is expected, what needs to be improved, and what performance has been satisfactory. Do not get caught writing glowing performance evaluations and then turn around and fire an employee. Be honest in evaluations, and if the performance is not up to expectations, document it in the evaluation. Imagine explaining to a jury why an employee who has been evaluated as “excellent” in all categories for the past five years was suddenly fired for substandard performance. Either ensure performance evaluations work for the utility, or don’t do them at all.

The importance of documentation cannot be overstated. As soon as a performance or discipline problem crops up, start documenting communications to the employee. It is best to follow a progressive disciplinary process: 1) verbal warning; 2) written warning that the job is in jeopardy; 3) if necessary, termination. Be sure to note dates and the circumstances that cause every action to be taken. Include what policies have been violated, what corrective and disciplinary action has been taken, and also reiterate any previous transgressions by the employee.

Always notify an employee that his or her job is in jeopardy in writing. There are five key words to

use when warning an employee that he or she is in danger of being terminated: *Your job is in jeopardy*. Put all “job is in jeopardy” warnings in writing, and ask the employee to sign the warning. If he or she refuses to do so, try to make sure that there are two of you representing the employer in the disciplinary counseling session, and simply write on the document, “This final warning was given to John Doe on [date]; he/she refused to sign the document, but he/she is aware that his/her job is in jeopardy.” Put the document in the employee’s personnel file, and be prepared to provide it as evidence if the employee is ultimately fired and files for unemployment benefits.

Another good rule of thumb: Don’t put anything in employees’ personnel files that you wouldn’t want a jury to see. Be factual, objective and fair. Preserve all such records, especially documentation regarding the termination itself.

## Carrying out a termination

Perform the termination quickly and professionally. Remember to use good manners, no matter how difficult the situation is. Preserve the employee’s dignity and confidentially throughout the termination process. This is no time to make an example of an employee, no matter how angry the parties may be.

Frequently, it is the manner in which a termination is handled, rather than the termination itself, that leads to litigation. Even if a worker has clearly demonstrated that he or she cannot function as a satisfactory employee, he or she should still be treated with dignity and respect. Courtesy, common sense, and discretion will go a long way in preventing embarrassment and avoiding emotional distress. Remember: An employee who is treated with respect and dignity during the termination process will be less likely to sue you. Further, if it comes to this, courtesy will help the utility appear “fair” to a jury of 12 average people,



most of whom will be employees rather than business owners or managers.

Always conduct an exit interview with the employee. Do not simply hand him or her a “pink slip” with a final paycheck and usher him or her out the door. If proper documentation describing poor or unacceptable performance (and informing the employee of this all along) has been performed, then the final act of firing will not come as a complete surprise.

If an employee is being terminated because he or she failed to come to work as required, then a written termination notice should be mailed by certified mail to document the decision.

The utility’s manager and the employee’s supervisor, if appropriate, should conduct the exit interview. Depending upon the utility’s size, the person who handles employee benefits may also be involved.

Some guidelines for conducting this meeting include:

- Be honest and clear about the reasons for the discharge. Avoid personal statements that might degrade or humiliate the individual or vague statements which might suggest that the situation is reversible.
- Be brief—the less that is said, the less there will be to explain later.
- Don’t argue with the employee.
- It is sometimes helpful to have another individual (the person who handles your benefits) present as a witness and a support for the employee, particularly if emotional reactions are anticipated.
- If you are concerned that an employee may become violent or take legal action, consider preparing a statement explaining the termination and read it verbatim to the employee.
- Present a precise explanation of severance-pay procedures, benefits-continuation forms, pension or profit-sharing payouts, and other available assistance, such as outplacement counseling.
- Never argue with an employee to justify a termination decision. If appropriate action has been taken in reaching the decision (that is, discussing the consequences of failing to meet performance criteria), the termination decision should not be a surprise to the employee. Be courteous, confident and firm.
- If an employee asks what he or she can do to get the decision reversed, inform him or her that the decision is final.
- Employees might respond that the termination will cause hardship to themselves and their families. In the case of an employee who is terminated for poor performance, it might be pointed out that the employee had ample warning. In any case, you may refer to the benefits for which the employee is eligible.
- If an employee becomes emotional, allow him or her ample time to recover, but do not start making apologies.
- If an employee shouts or curses, state in a normal tone of voice that the meeting will not continue until he or she calms down. Never respond in kind.
- If a terminated employee threatens a lawsuit, do not respond.
- Call a witness if an employee makes a violent threat. If it is suspected that the employee is about to become violent and cause harm to others or company property, call immediately for assistance from other employees, security, or the police.
- Do not hold back final accrued wages, salary, vacation and other payments previously



earned to avoid an investigation and other penalties that could be imposed. Earned payments, such as wages and other monies, should be paid immediately upon a firing and presented to the terminated employee in the form of a check at the time of the exit interview. Since substantial fines, penalties and other problems can ensue, avoid holding back these payments unless counsel has recommended or approved that such action be taken.

- Allow the individual to remove personal belongings at a low-visibility time, after hours or on a weekend. Prepare a checklist of company property that should be accounted for, including keys, credit cards, tools and equipment, and computer discs.

## Employee questions

Losing one's job normally is very hard for an individual. Try to make the process as smooth as possible for the terminated employee by being prepared to answer these questions that employees typically raise during termination meetings:

- When is my last day?
- When should I leave?
- Will I receive severance pay? How much?
- Will I receive bonuses that I was eligible for?
- When will I receive my last paycheck?
- Will I be paid for accumulated sick leave or vacation time not taken?
- Am I eligible for unemployment insurance?
- Will you or the company provide employment references? What will you say if you are asked to provide a reference?
- What will my co-workers and clients be told about my termination?

- Will my medical and insurance benefits continue?
- When must I return company property (such as a car, pager, cellular phone, keys, or tools)?
- What happens to my pension, profit-sharing or saving plans?
- Can I continue to use my office or work area to look for a job?
- Can I use other employees' or my own office computer to prepare my resume?
- Can I say goodbye to everyone before I go?
- When can I go back to my work area to get all my personal things?

Be prepared for these questions to keep the exit meeting as short as possible.

## After terminating an employee

When the employee exit meeting is completed, there are a few other matters to attend to, including:

- Document the termination interview in writing immediately, detailing the conversation, reactions, and emotional tone of both parties. This is essential for a response to any future challenge to the termination.
- Inform staff and/or co-workers of the termination by word of mouth or by a memo. In the case of for-cause termination, the incident should be mentioned only briefly in a non-defamatory manner. If performance is the reason, state that the employee and the organization have agreed to part company without going into the details of the employee's performance problems.
- In the case of staff reduction or layoffs, the remaining staff should be assured that the termination was warranted and that no additional layoffs are anticipated at this time. (If

additional reductions are expected, employees should be informed that such an action may be required and that they will be informed on or before a specific date.)

- Inform customers who deal with the discharged employee that the utility company will continue to serve their needs as before. When necessary, name a specific individual who will replace the terminated employee.
- Start the hiring process with a renewed commitment to find the best person for the job and the utility.

There are several reasons the utility could end up in court for firing an employee:

- **Retaliatory discharge:** Employees have a right to sue for retaliatory discharge if they are fired because of their efforts to compel their employers to comply with the law. Courts have held that employers may not discharge an employee who: 1) insists that an employer comply with the Occupational Safety and Health Act (OSHA) standards or the food and drug laws; 2) furnishes evidence to law enforcement officials regarding criminal violations of co-employees; 3) refuses to give perjured testimony on an employer's behalf, violate a statute, commit a crime, or illegally alter pollution-control records; 4) refuses the sexual advances of supervisors; 5) promotes unionism; 6) serves on a jury; 7) exercises his or her rights under workers' compensation law; 8) acts as an election official; or 9) cooperates with an official investigation.

Not covered under this right of action are employees who are discharged because of a private dispute, even if the employer's actions appear arbitrary or unfair. The issue may involve such matters as internal management disputes, taking excessive sick leave, exercising the right to examine the company's books, impugnation

of the company's integrity, or a refusal to take psychological stress evaluations.

- **Discrimination:** Federal law makes it illegal for most employers to fire an employee because of the employee's race, gender, national origin, disability, religion or age (if the person is older than 40). Federal law also prohibits most employers from firing someone because that person is pregnant or because that person has recently given birth or because of any related medical conditions.
- **Refusal to submit to a lie detector test:** The federal Employee Polygraph Protection Act prohibits most employers from terminating employees for refusing to take a lie detector test. Many state laws also set out strong prohibitions against using lie detector tests.
- **Alien status:** The federal Immigration Reform and Control Act (IRCA) prohibits most employers from using an employee's alien status as a reason for terminating that employee as long as that employee is legally eligible to work in the United States.
- **Subpoena in criminal cases:** An employer who discharges or penalizes an employee who, upon notice to his or her employer, is absent as a result of a subpoena to attend a criminal trial as a witness, has acted in criminal contempt of court and is subject to punishment.

**Final note:** As with all matters that involve potential liability or litigation, consult an attorney for questions concerning a termination that may be related to any of the above conditions or regarding any aspect of the hiring process, including those that might subject you to claims of discrimination.



## SAMPLE JOB DESCRIPTIONS

The information beginning on the next page is designed to serve as tools to assist you in hiring new employees, terminating employees, and for creating your own job descriptions for employees at your utility. The sample job descriptions are not ready-to-use and should not be distributed as-is. They must be tailored to fit your utility. If you choose to adopt these descriptions, be sure to review them carefully, **fill in all the blanks and replace all words enclosed in brackets** (example: [first name and last name]) with the required information. Ensure that all the information is pertinent to your specific utility.

### GET THIS TEXT ELECTRONICALLY

The text of each of the following job descriptions is available electronically so you can edit them, add to them, and adapt them to your system's particular situation. Download Microsoft Word documents of these job descriptions on the RCAP website at [www.rcap.org/boardguide](http://www.rcap.org/boardguide).



# F3 General Manager

## Position summary

Responsible for the overall operations, management and finances of the organization. Under the general supervision of the board of directors, establishes policies and procedures for directing all internal and external affairs of the organization. Supervises all personnel within the organization. Responsible for operating the utility in accordance with all applicable state and federal laws and requirements.

## Education and experience

Must be a high school graduate or equivalent. Bachelor's degree from four-year college or university is desired. Five or more years of utility management experience, including experience in personnel and financial management, is required. Grade "B" Surface/Ground Water license or higher is desired.

## Managerial duties

- Responsible for the administration and operation of the corporation
- Provides assistance to the board and committees as requested
- Supervises personnel in the performance of their assigned duties
- Ensures all water and wastewater operations conform to state and federal requirements
- Implements all board policies, including rates, service provision, personnel, and purchasing
- Coordinates corporation's political efforts with local and state politicians
- Plans, develops and implements organization policies and goals
- Generates monthly operations and finance reports for board review
- Maintains required reports for regulatory agencies
- Prepares annual budget for submission to board for review and approval
- Recommends system improvements and expansion to the board
- Coordinates and directs work with engineers, contractors and consultants
- Represents and promotes the corporation in industry, manufacturing and/or trade associations
- Responds to customer complaints and emergency conditions according to adopted procedures
- Performs other duties as assigned

*Performance of these responsibilities is a necessary and vitally important part of providing safe and cost-effective water and wastewater services to our customers.*



## Qualifications and requirements

To perform this job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skills, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

### Language skills

Ability to read, analyze, and interpret common scientific and technical journals, financial reports, and legal documents. Ability to respond to common inquiries or complaints from customers, regulatory agencies, or members of the business community. Ability to effectively present information to the public groups, and/or boards of directors.

### Computer skills

Word processing, spreadsheets, email.

### Supervisory responsibilities

Manages all employees for the corporation. Carries out supervisory responsibilities in accordance with the organization's policies and applicable laws.

### Work environment

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. While performing the duties of this job, the employee is occasionally exposed to work near moving, mechanical parts and risk of electrical shock. The noise level in the work environment is usually moderate.

### Physical demands

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Requires sitting, standing, bending and reaching
- May require lifting up to 50 pounds
- Requires manual dexterity sufficient to operate standard office machines, such as computers, fax machines, calculators, copier, the telephone and other office equipment
- Requires normal range of hearing and vision
- Working conditions will be indoors and outdoors. Exposure to weather, fumes, odors, dust and risk of bodily injury.

- Possible exposure to toxic conditions

I have read, understand and agree to perform all of the tasks and responsibilities as outlined above.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

## F4 Certified Water Operator

### Position summary

Under the supervision of the board of directors of \_\_\_\_\_ Water Utility, the certified operator performs a wide variety of tasks necessary for the efficient production and distribution of water of sufficient quantity and quality to meet customer demand. This position will be on 24-hour call every day, including weekends and holidays. The position is hired by the full board of directors. There is a six-month probationary period. Evaluations are conducted at the end of the probationary period and annually thereafter during the month of the utility's annual membership meeting.

### Education and experience

Requires, at a minimum, a high school diploma or equivalent and at least **[number]** years' experience working at a public water supply system. This position also requires a valid Class \_\_\_\_ (or higher) Water Operator Certificate. The board may waive the education and experience requirements if there are no applicants meeting the requirements for this position. However, if such a waiver is granted, the probationary period is automatically extended to one year, in which time the person filling this position may be dismissed by a majority vote of the board if there is reasonable evidence that the lack of education and experience is hindering the execution of the required duties stated below.

### Operational duties

- Adheres to minimum operator guidelines.
- Ensures compliance with federal (EPA) and state water-quality standards.
- Provides regular oral and written operations and maintenance reports to the board summarizing system status/needs.
- Maintains and supervises control over the inventory of materials, supplies, chemicals, and equipment.

- Performs routine preventative maintenance inspections of equipment; performs repairs, adjustments, and maintenance of pumps, electric motors, valves, meters, chemical feeders, and fire hydrants; lubricates and oils machinery; maintains gas engines and compressors; and maintains proper records of preventative maintenance work.
- Calculates water-loss figures and supervises leak-detection surveys when water loss exceeds 25 percent of water produced.
- Responds to emergency conditions according to \_\_\_\_\_ Water Utility's Emergency Operating Procedures.

*Performance of these responsibilities is a necessary and vitally important part of providing safe and cost-effective water and wastewater services to our customers.*

## Duties related to the management and administration of the system

- Advises and assists the board regarding repair and/or replacement of needed equipment.
- Develops estimates for recommended purchases of goods and services.
- Documents all maintenance activities on approved Operations & Maintenance Recordkeeping System and presents copies of all work orders along with a statement to the board each month for review and approval.
- Works closely with engineers, contractors and state regulatory officials.
- Participates with the board and consulting engineers in planning system improvements or expansions.
- Handles customer inquiries and complaints related to water service or billing questions.

## Required knowledge and skills

Extensive knowledge of the methods, practices, tools and materials used in the operation, maintenance, and repair of water storage, treatment, and distribution equipment and machinery, including but not limited to:

- Extensive knowledge of chlorination disinfection and corrosion-control equipment and required discharge rates.
- Working knowledge of the mechanics of pumps and other electrical equipment and machinery.
- Ability to learn plant electrical systems, power-circuit changes and circuit-breaker resets.
- Ability to perform basic chemical tests.
- Ability to detect and diagnose faulty operation of equipment and make corrections.
- Thorough knowledge of the equipment, tools and procedures used in installing and repairing water mains, services, fire hydrants and meters.
- Knowledge of applicable laws and safety regulations for crew and public safety and the proper use of chlorine and other hazardous chemicals.
- Ability to plan, organize, and supervise the operation, maintenance and repair of the utility's storage, treatment and distribution systems, including the organizational skills necessary for scheduling daily activities.

I have read, understand and agree to perform all of the tasks and responsibilities as outlined above.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

## F5 Maintenance Service Technician

### Position summary

Under the supervision of the certified operator, the maintenance service technician performs a wide variety of tasks necessary for the efficient production and distribution of water of sufficient quantity and quality to meet customer demand. This is an exempt (salaried) position that works under minimum supervision. Position will be on 24-hour call every day, including weekends and holidays. The position is hired by the full board of directors. There is a six-month probationary period. Evaluations are conducted at the end of the probationary period and annually thereafter during the month of the utility's annual membership meeting.

### Education and experience

Requires, at a minimum, a high school diploma or equivalent and at least **[number]** years' experience working in mechanical trade environments. The board may waive the education and experience requirements if there are no applicants meeting the requirements for this position. However, if such a waiver is granted, the probationary period is automatically extended to one year, in which time the person filling this position may be dismissed by a majority vote of the board if there is reasonable evidence that the lack of education and experience is hindering the execution of the required duties stated below.

### Other requirements

Because the person filling this position is required to drive the utility's vehicles, it is required that the person possess a valid driver's license and possess and maintain a good driving record with no DUI/DWI convictions within the past three years. There will be no waivers granted to this requirement.

### Operational duties

- Assists the certified operator in ensuring compliance with federal (EPA) and state water-quality standards.
- Assists the office manager by maintaining control over the inventory of materials, supplies, chemicals and equipment.

- Assists the certified operator in routine preventative maintenance inspections of equipment; performs repairs, adjustments and maintenance of pumps, electric motors, valves, meters, chemical feeders and fire hydrants; lubricates and oils machinery; maintains gas engines and compressors; and maintains proper records of preventative maintenance work.
- Assists with leak-detection surveys.
- Performs normal maintenance, including leak repairs and meter installations.
- Reads water meters monthly and rereads as necessary to respond to customer billing complaints.
- Responds to emergency conditions pursuant to \_\_\_\_\_ Water Utility Emergency Operating Procedures.
- Performs maintenance of buildings and grounds and ensures that the well sites are kept clean.
- Reports all leaks, meter malfunctions and other problems to the office manager.
- Performs other duties delegated by the board, certified operator, or office manager.

*Performance of these responsibilities is a necessary and vitally important part of providing safe and cost-effective water and wastewater services to our customers.*

## Required knowledge and skills

- Working knowledge of the methods, practices, tools, and materials used in the operation, maintenance and repair of water storage, treatment and distribution equipment and machinery.
- Working knowledge of the equipment, tools and procedures used in installing and repairing water mains, services, fire hydrants and meters.
- Ability to read gauges and meters accurately.
- Ability to prepare accurate records and reports.
- Physical stamina and no physical limitations on lifting, driving, walking or bending.
- Ability to understand and follow oral and written instructions.
- Ability to communicate effectively.
- Ability to establish and maintain effective working relationships with the Board, staff, contractors, engineers, and customers.

I have read, understand and agree to perform all of the duties and responsibilities as outlined above.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

# F6 Office Manager

## Position summary

Responsible for administration, accounting and payroll. Responsible for assisting customers with inquiries, account information, processing applications, and any other clerical duties to meet business objectives. Supervises and monitors personnel assigned to assist with these same duties. Provides ongoing guidance to staff as appropriate. Prepares reports and assists in correspondence and letter writing as required. Completes accounts payable and receivable. This is an exempt (salaried) position.

## Essential duties and responsibilities

- Directly responsible for the administration, accounting, payroll and customer service
- Operates computer, copy machine and other standard office equipment
- Establishes and implements office routines and filing systems
- Composes routine correspondence
- Answers telephone (and email inquiries) and handles routine inquiries from the public
- Performs clerical duties, including maintaining financial records
- Processes payroll for employees
- Prepares billing invoices according to meter readings
- Assists the general manager in maintaining all necessary files
- Ensures that rules and policies established by the board and as directed by the general manager are implemented and enforced in a fair and equitable manner
- Continues to be educated in all aspects of administration, payroll, correspondence and computer operations
- Communicates with employees to provide, exchange, or verify information, answer inquiries and assists as needed to complete daily tasks
- Consults and addresses difficult issues, resolves problems or complaints by customers and/or employees. Manages and provides assistance in guiding staff with policy, procedure, office operations, and customer inquiries.
- Prepares accounts-payable checks in response to invoices, mails invoices with checks to vendors, and returns invoices for filing
- Orders and maintains inventory or various office supplies
- Maintains contact with customers and outside vendors
- Other duties as assigned

*Performance of these responsibilities is a necessary and vitally important part of providing safe and cost-effective water and wastewater services to our customers.*

## Qualifications

To perform this job successfully, the individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skills, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

## Education/experience

Associate degree (A.A.) or equivalent from two-year college or technical school; or six months to one year related experience and/or training; or equivalent combination of education and experience.

## Language ability

Ability to read and interpret documents, such as safety rules, operating and maintenance instructions, and procedure manuals. Ability to write routine reports and correspondence. Ability to speak effectively before groups of customers or employees of organization.

## Math ability

Ability to add, subtract, multiply, and divide in all units of measure, using whole numbers, common fractions, and decimals. Ability to compute rate, ratio, and percent and to draw and interpret bar graphs.

## Computer and office-equipment skills

Word processing, spreadsheets, accounting software, general ledger, payroll, accounts receivable, accounts payable, email, adding machine, copiers, fax machine, and cash register.

## Certificates and licenses

None

## Supervisory responsibilities

Directly supervises employees in the administrative department. Carries out supervisory responsibilities in accordance with the organization's policies and applicable laws. Responsibilities include interviewing, hiring, and training employees; planning, assigning, and directing work; appraising performance; rewarding and disciplining employees; addressing complaints and resolving problems.



## Work environment

The work environment characteristics described are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is occasionally exposed to work near moving, mechanical parts and risk of electrical shock. The noise level in the work environment is usually moderate.

## Physical demands

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. While performing the duties of this job, the employee is regularly required to sit and talk or hear. The employee is frequently required to walk; use hands to finger, handle, or feel and reach with hands and arms. The employee is occasionally required to stand and stoop, kneel, crouch, or crawl. The employee must regularly lift and/or move up to 10 pounds, frequently lift and/or move up to 25 pounds and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision and distance vision.

I have read, understand and agree to perform the duties and responsibilities as outlined above.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

# F7 Bookkeeper/Operations Clerk

## Job summary

Under the supervision of the secretary/treasurer of the \_\_\_\_\_ Water Utility, the bookkeeper/operations clerk performs a wide variety of accounting functions related to the proper financial management and operation of the utility. This is a nonexempt (hourly-wage) position that works under minimum supervision. The position is hired by the full board of directors. Employee must be bonded.

## Education and experience

Requires, at a minimum, a high school diploma or equivalent with at least **[number]** years' cash accounting experience working in a public or private organization, preferably with a high level of customer contact. Position requires a basic knowledge of computer operation, preferably including experience with accounting and billing software.

## Operational duties

- Maintains general and special account ledgers in a standard, double-entry chart of accounts for the classification of all assets, liabilities, expenses, revenues and other accounting transactions.
- Maintains check registers, cash receipt journals, monthly disbursement and collections summaries, and reconciles monthly bank statements.
- Prepares checks for board signature.
- Maintains and prepares payroll, including federal, state and local withholding taxes.
- Prepares bills, receives payment of water bills, and posts payments to accounts; makes change and prepares monies for deposit; prepares shut-off notices, bills, and other materials for mailing. Prepares and submits to the board of directors those checks requiring board signature.
- Prepares monthly financial reports providing the current month's revenues and expenditures; actual year-to-date revenue and expenditures; projected 12-month revenues and expenditures versus budgeted revenues and expenditures; net gain or loss for the month and year-to-date; beginning and ending balances for all operating and reserve accounts; and a summary of all past-due accounts.
- Accepts applications for new service, transfers or termination of service; maintains individual customer accounts.
- Provides information and assistance to customers with questions or complaints, or refers customers to proper person.
- Performs general office duties, such as ordering office supplies, answering correspondence, maintaining correspondence files, and other clerical tasks as assigned by the supervisor.

*Performance of these responsibilities is a necessary and vitally important part of providing safe and cost-effective water and wastewater services to our customers.*

## Duties related to the management and administration of the system

- Advises and assists the board regarding financial and administrative procedures.
- Advises and assists the board in developing the annual budget.
- Assists external auditors to complete annual audit.
- Supervises temporary or part-time clerical help.
- Works closely with board and operator in procuring equipment, supplies and outside services.

## Duties related to the strategic goals of the system

- Collects any past-due accounts that remain after the board members' three-month collection activity.
- Determines if hardship applications qualify for time-payment plan.



- Prepares and submits to board for signature a letter to customers, stating policy dealing with unpaid bills and the intention to enforce it.
- Mails letter with customer bills.
- Reports orally and in writing the Past-due Account Summary at monthly board meetings.
- Assists board Budgeting and Rate-setting Committee to develop budgets for the next five years.
- Assists Budgeting and Rate Setting Committee to complete a rate study.
- Assists in educating the public about the need for a rate increase.

## Required knowledge and skills

- Knowledge of cash accounting procedures.
- Knowledge of basic math principles.
- Knowledge of basic office procedures.
- Working knowledge of computers.
- Ability to learn new software programs.
- Ability to sort, classify, code and otherwise prepare financial records for computer input.
- Ability to prepare local, state and federal payroll tax documents.
- Skills in public relations and proper telephone etiquette.
- Ability to respond to inquiries from the public, provide assistance and routine information, and refer non-routine questions to the proper person.
- Ability to maintain files in an established filing system using set procedures.
- Ability to understand and follow oral and written instructions.
- Ability to communicate effectively orally and in writing.
- Ability to supervise subordinates' work.

I have read, understand and agree to perform the duties and responsibilities as outlined above.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

# Appendix G

## Sample Policy Statements

The sample policy statements beginning on the next page are designed to serve as a tool for creating your own policies at your utility. These policies are not ready-to-use and should not be distributed as-is. They must be tailored to fit your utility. If you choose to adopt these policies, be sure to review them carefully and fill in all the blanks and replace all words enclosed in brackets (example: [first name and last name]) with the required information. Ensure that all the information is pertinent to your specific utility.

### **GET THIS TEXT ELECTRONICALLY**

The text of each of the following job descriptions is available electronically so you can edit them, add to them, and adapt them to your system's particular situation. Download Microsoft Word documents of these job descriptions on the RCAP website at [www.rcap.org/boardguide](http://www.rcap.org/boardguide).

# G1 Customer-Service Policy

**Rules and Regulations of the \_\_\_\_\_, herein referred to as the “utility.”**

Issue date:

Revision date:

**Definitions.** The following terms when used in this policy mean:

1. *Applicant:* An individual, firm, partnership, corporation, authority, or other entity residing in or located within the service area applying for water service.
2. *Board:* The governing body of the utility.
3. *Customer:* An individual, firm, partnership, corporation, authority, or other entity who has applied for and is currently receiving water service.
4. *Point of delivery:* The point of delivery of service to a customer shall be at the water meter unless otherwise specified in the Water Use Agreement.
5. *Point of use:* The precise location at which water is used or consumed (a residence, building, or similar location on the customer’s premises where water is to be used by the customer).
6. *Service:* The availability for use by the customers of water adequate to meet the customer’s requirements. Service shall be considered “available” when the utility maintains the water supply at normal pressure at the point of delivery in readiness for the customer’s use, whether or not the customer makes use of it.
7. *Service area:* The geographic area served by the utility, described generally as \_\_\_\_\_.
8. *Service line:* The water line that extends from the point of delivery to the point of use for each customer.

9. *Water use agreement:* The agreement or contract between the customer and the utility, pursuant to which water service is supplied and accepted.
10. *Water service connection:* A water meter and other equipment for supplying water to a single point of use. A single customer may be supplied by more than one service connection if that customer has more than one point of use.

## General

1. The purpose of the utility is to provide a safe supply of water to customers within its service area. Water supply and use shall be in conformance with these rules and regulations and the applicable rate schedule of the utility.
2. Each customer of the utility shall be eligible to receive service from the utility only after a Water Use Agreement has been executed between the customer and the utility. If a customer requires service at more than one point of use, a separate Water Use Agreement shall be executed for each point of use.
3. The utility agrees to provide service to the point of delivery, and install and maintain at its expense one metered service connection for each customer point of use, based on a valid Water Use Agreement.
4. The customer will install and maintain at his/her own expense service lines from the point of delivery to the point of use. The customer will make repairs on a timely basis as necessary.
5. A metered service connection is for the sole use of the applicant or customer. Customers shall not permit the extension of pipes for the purpose of transferring water from one



property to another, from one point of use to another, nor share, resell or sub-meter water to any other person or entity.

6. Standard residential rates shall be applicable to all multiple residential and point-of-use properties. Multiple residential properties include mobile home parks, apartment buildings, motels, housing complexes, or similar residential developments. The board may, at its discretion, choose to serve multiple residential properties through a single master meter. In such cases, the owner must agree in writing that s/he will be responsible for payment of the monthly water bill. The system's monthly bill for multiple residential properties will be computed as follows:

(Minimum residential rate x total number of dwelling units)

+ Per 1,000 gallon charge for use above the total minimum gallon usage

---

= Total monthly bill

7. At no time shall any customer or individual connect a non-system water source to any service line or water line that is also connected to the system. Representatives of the utility shall have the right to enter the customer's premises for the purpose of inspection and enforcement of this policy at reasonable hours. Violations of this policy shall constitute cause for immediate disconnection of service.
8. It is the responsibility of each customer to anticipate changes in occupancy and to have service transferred to the new customer in accordance with the policy for obtaining service. Until service is formally transferred, the original customer shall be responsible for payment of service. The board may refuse to transfer service until all past-due bills and charges have been paid.
9. Customers agree to pay the established fee

for water service in accordance with applicable rate schedules at the time service is provided by the utility.

10. Representatives of the utility shall have the right at any reasonable hour to enter customer's property in order to read water meters, inspect piping, perform other duties for the proper maintenance and operation of service, or to remove meters and equipment upon discontinuance of service by either the customer or the utility.
11. The utility will make reasonable efforts to supply continuous, uninterrupted service. However, it shall have the right to interrupt service for the purpose of making repairs, connections, extensions, or for other necessary work. Efforts will be made to notify customers who may be affected by such interruptions, but the utility will not accept responsibility for losses which might occur due to such necessary interruptions. The utility does not accept responsibility for losses due to interruptions of service caused by storms, floods, or other events beyond the utility's control.

## Obtaining water service

1. Applications for water service shall be accepted at the system office and must be accompanied by a connection fee of \$\_\_\_\_\_ and/or a meter deposit of \$\_\_\_\_\_. The connection fee is non-refundable. The meter deposit will be maintained in a special account to ensure payment of water charges. When service is discontinued, the portion of the meter deposit remaining after current bills are paid will be returned to the customer within 15 days. Customers with service termination due to nonpayment will have their deposit applied to their accounts to satisfy arrears prior to actual termination of water service.

2. Before installing a service connection and providing water available for use, the utility may require the applicant to pipe his/her home and be ready to accept service.
3. Customers will arrange for a licensed plumber to make connections between the service line and the meter. The system operator will inspect plumbing work prior to completion of the work.

## Customer billing

1. Customers will be billed monthly in accordance with the rate structure of the utility.
2. Water meters will be read between the **[date]** and the **[date]** of each month.
3. Bills will be mailed on or about the **[number]** day of each month.
4. Water consumption and sewerage will be billed as separate items on the bill.

## Payment terms

1. Payment is due by the **[number]** day of each month.
2. Payments made after the **[number]** day will incur a penalty equal to **[number]** percent of the water bill or \$\_\_\_\_, whichever is less.

## Termination of water service

1. Customers who fail to pay the entire amount they owe by the last day of the month will be subject to termination of water service by the **[number]** day of the following month.
2. Customers with unpaid bills on the **[number]** day of the month will be notified by mail that water service will be shut off on the **[number]** day of the following month unless payment is made. This shutoff notice will be mailed no

later than **[number]** days prior to termination of service.

3. Customers subject to termination of water service will be charged a disconnect fee of \$\_\_\_\_, which represents time involved in removing the meter, administrative costs, and the like.
4. Customers may avoid termination of service by either paying the amount in arrears at the utility office before the scheduled shutoff date or by receiving a hardship deferment and signing a deferred payment plan specifying payment terms before the scheduled shutoff date.
5. Customers may appeal a notice of termination of water service. The utility manager or bookkeeper is designated as the utility representative for hearing customer appeals of notice of termination of water service. The representative is authorized to correct errors of the utility, adjust the amount due to the utility, receive payment to satisfy the amount in arrears, and to negotiate deferred payment plans. A written record of customer appeal will be prepared and maintained on file by the utility representative. The board will hear appeals at regularly scheduled board meetings **ONLY AFTER** the customer has followed the administrative procedure denoted above. Service will be shut off as scheduled regardless of a customer's intent to appeal to the board.

## Deferred-payment plan for hardship

1. A customer may apply for deferred payment **BEFORE** the shutoff date by filing a claim for hardship with the bookkeeper at the utility office. If the hardship qualifies, the customer will sign an agreement for a deferred-payment plan.
2. Hardships eligible for deferred payment plans include loss of job, medical emergency,



excessive bill (usually resulting from large leaks), and extraordinary financial difficulty.

3. The maximum length for a deferred payment plan shall be **[number]** days unless the approved plan specifies otherwise.
4. Minimum monthly payment amounts shall not be less than **[number – percentage/ fraction]** the total amount due, unless the approved plan specifies otherwise.
5. Deferred-payment amounts shall be in addition to the regular service bill amount.

### Reconnection of water service after termination for non-payment

1. Customers desiring restoration of water service after termination for non-payment must pay debts in the full amount AND pay an additional deposit in accordance with the fee schedule of the utility AND pay the service fee for reconnection in accordance with the utility's fee schedule.

### Meters

1. Meters will be furnished, installed, owned, inspected, tested and kept in proper operating condition by the utility without cost to the customer. A complete record of tests and histories of meters will be kept. Meter tests will be made according to methods of the American Water Works Association by the utility as often as deemed necessary.
2. Service meters whose error does not exceed  $\pm 2$  percent shall be considered as being within the allowable limits of accuracy for billing purposes. The percentage of error will be considered by taking the average of the error at full load and the error at 10 percent load, unless a customer's rate of usage is known to be practically constant—in which case, the error at such constant use will be used.

3. Meters shall be set in an accessible location on the outside of buildings, except where otherwise directed by the utility. All meters shall be set horizontally, and never connected to a vertical pipe. Meters set outside buildings shall be placed in a meter box furnished and installed by the utility.
4. Meter tests requested by customers will be performed without cost to the customer if the meter is found to be in excess of + 2 percent (either fast or slow). Otherwise, the customer who requested the test will be charged for the cost of performing the test.
5. The customer shall be responsible for any damage to the meter installed for his/her service caused by other than normal wear and tear.

### Main extensions

In extending a water main to serve an applicant, the utility may, at its discretion, exercise one of the following options:

1. If the cost of the extension is less than the average cost of the entire system to each user and sufficient construction funds are available, the utility may elect to make the extension upon the applicant's payment of the required connection fee and meter deposit.
2. If the cost of the extension is greater than the average cost of the entire system to each user, but construction funds are available to the extent of such average cost, the utility may elect to contribute to the extension in the amount of such average cost and require the applicant to deposit in cash the additional cost plus the connection fee. If/As additional customers are connected to the extension and as construction funds become available, all or part of the original customer's deposit may be returned. Any portion of the original deposit remaining after the expiration of a five-year



period will become property of the utility. In no case will interest be paid on such deposits.

3. In the event that the utility does not have funds available to pay for the construction in the amount of the average cost per user of the entire system, it may require as a condition of extending service that the applicant deposit an amount equal to the entire cost of the extension in addition to the charge of a connection fee. In such event, the utility may, as funds become available, return to the customer that portion of the deposit equal to the average cost of the system per user. No interest will be paid on such deposits.

## Services

1. The utility will install and pay for all water-service pipes from its mains to the meters on property abutting the travelway along which the main is installed. The service pipes shall not be less than 3/4-inch in size.
2. The utility will install and pay for the utility cock, meter, and meter setting.

## Applicants having excessive needs

1. In the event an applicant whose water requirements are found to exceed the utility's ability to supply them from the existing plant without adversely affecting service to other customers, the utility will not be obligated to render such service unless and until suitable self-liquidating financing is arranged to cover necessary investment to expand the plant.

## Availability of records for public inspection

1. Utility records, including minutes of meetings and financial records, are available for inspection by the public during office hours.

2. Utility records, including minutes of meetings and financial records, are available online on the utility's website at **[URL]**

## Notice of meetings of the board

1. The Board meets in regular session on the **[number]** day of each month, at **[time]**. Special meetings of the board are held as necessary. Notice of special meetings is posted at the utility office and on the utility website at least 48 hours prior to the meeting.
2. The agenda for regular and special board meetings is posted in the utility office and on the utility website at least 24 hours prior to the meeting.

## Changes to this policy

1. The customer service policy is subject to change as required and voted upon by the board. The board shall establish rates and fees for service as necessary to operate and maintain the utility.

## Schedule of rates

1. Residential rate (5/8-inch meter, 3/4-inch meter, or multi-residential master meter):

First ____ gallons	\$_____	(minimum monthly charge)
Next ____ gallons	\$_____	per 1,000 gallons used
Next ____ gallons	\$_____	per 1,000 gallons used
Next ____ gallons	\$_____	per 1,000 gallons used
2. Commercial rate:
3. Agricultural rate:
4. Industrial rate:



# G2 CUSTOMER-SERVICE POLICY OF THE \_\_\_\_\_ WATER ASSOCIATION

## I. General authority

The \_\_\_\_\_ Water Association board has unanimously passed a resolution addressing the herein-stated customer-service policy. The \_\_\_\_\_ Water Association board has the ultimate authority and responsibility to ensure the financial health and stability of the association. It is inherent that every customer of the association is treated in a fair and equitable manner and that each customer pay for the services provided by the association.

## II. Definitions

- A. Applicant for service:** Any person or entity applying to \_\_\_\_\_ Water Association for new water service.
- B. Association:** The member-owned public water system known as \_\_\_\_\_ Water Association.
- C. Bad debt:** A balance that is still owed on a customer's bill **[number]** days after the service connection has been terminated. Bad debts will be collected through prompt lawsuit filings for the purpose of being awarded a judgment and garnishment of wages to reimburse the association for all legal expenses, court costs and bad debt from the customer.
- D. Billing clerk:** The billing clerk is contracted to provide accounts-receivable services, including billing, collecting, posting and depositing all customer payments.
- E. Board:** The directors of the association that have been duly elected in accordance with the bylaws of the association.
- F. Board meeting:** The \_\_\_\_\_ Water Association board conducts its regular monthly board meeting on the **[number/day]** of each month. All meetings are open to the public, but anyone wishing to address the board must notify a board member or employee or contractor of the association at least **[number]** day prior to the board meeting.
- G. Certificated area:** The delineated boundary established by the \_\_\_\_\_ Public Service Commission establishing \_\_\_\_\_ Water Association as the sole water utility provider within the service area.
- H. Cross-connection:** Any potential hazard that exists past a customer's service connection that could introduce contaminants into the system's water supply. All cross-connections shall have approved backflow/backsiphonage prevention devices installed at the service connection at the customer's expense.
- I. Customer:** Any household or business that is receiving water supplied by \_\_\_\_\_ Water Association.
- J. Customer grievance:** An informal complaint generated by a customer and directed to the association's billing clerk. The customer must inform the billing clerk of any suspected error or discrepancy in the billing of the customer's water usage. The billing clerk then investigates the customer grievance. The customer and billing clerk must present evidence before the board at a regular monthly board meeting.
- K. Delinquent:** A customer's account is considered delinquent if any portion of the

account is more than **[number]** days late.

**L. Engineer:** A professional, certified civil engineer with extensive experience in the hydraulic design and construction of potable water systems.

**M. Hardship agreement:** An informal written agreement between a customer of the association and the board. A hardship agreement is granted when a customer has incurred a large water charge that he is unable to pay the current bill in full. The hardship agreement is also granted when a customer has incurred a hardship such as an illness, family death, loss of employment, etc., and is unable to pay the current bill in full. The association will not terminate a service connection if a valid hardship agreement is in force.

**N. Late charge:** A **[number]** percent assessment of the current balance that has not been received by the **[number]** day of each month.

**O. Maintenance superintendent:** The maintenance superintendent is responsible for all aspects of operations and maintenance (O&M) for the association and for complying with Safe Drinking Water Act and Clean Water Act regulations under the supervision of the certified operator of record.

**P. Notice of intent:** Issued by the \_\_\_\_\_ County Department of Health environmentalist, an affidavit of an individual promising to install the on-site wastewater (sewerage) disposal system recommended by the environmentalist.

**Q. Payment-extension agreement:** An informal written agreement between a customer of the association and the board. The payment-extension agreement is granted to a customer before the **[number]** day of each month,

where the customer agrees to pay all past-due and current balances before the end of the current month. The association will not terminate a service connection if a valid payment-extension agreement is in force.

**R. Service charge:** One of two fees assessed if the full balance of a customer's account is not paid within **[number]** days. The first type of service charge is a collection fee. The collection fee is assessed if the board, its employees or contractors have to physically go to a customer's residence to collect the entire balance. The reconnection fee is assessed if the service connection is terminated for delinquency.

**S. Service connection:** The physical tap, line, curbstop, meter and meter box supplied by and owned by the association. Where the customer is required to pay for the installation of the above-mentioned equipment and to pay a security deposit to use the service connection, the association retains full ownership and control of the service connection. The customer is benefited by being the sole customer who has access to the service connection.

**T. Service extension:** Any extension of the \_\_\_\_\_ Water Association's existing facilities, including the installation of meters/service connections or main line extensions.

**U. Terminate:** To actually lock or cap the association's curbstop or to remove the association's meter for the purpose of discontinuing water service to the customer.

**V. Theft of water:** Anyone who tampers with the adjustment or removal of locking devices on a utility meter shall be held in violation and will be subject to the fines and imprisonment contained in the law. The customer who is



benefiting from theft of water will be held accountable, though s/he is not necessarily the person who has removed or tampered with the meter lock. The board will seek to prosecute any customer that is engaged in the theft of water.

**W. User agreement:** A contractual agreement between applicants for water service and \_\_\_\_\_ Water Association.

### III. Service-extension Policy

A. Meter installations and/or connections for individual applicants whose property intersects an existing water main

1. Applicants requesting water service to property where existing water mains are present either on the property or across a public road from the property and where a **new meter installation** is needed are required to complete the following procedures prior to the installation of a water meter:
  - a. Applicant shall first request that the maintenance superintendent confirm that an adequately sized water main exists either on the property where the service connection is to be located or across a public road from the property.
  - b. Upon confirmation of the location of the \_\_\_\_\_ Water Association's water main on or near the property of the applicant's proposed service connection, the applicant shall obtain a notice of intent from the \_\_\_\_\_ County environmentalist.
  - c. The applicant shall then make arrangements to meet the billing clerk in order to execute the user agreement, at which time the notice

of intent shall become the property of \_\_\_\_\_ Water Association and the applicant pays the applicable following fees:

Membership fee: (non-refundable contributed capital) \$ \_\_\_\_\_

Residential security deposit: (refundable upon termination of services) \$ \_\_\_\_\_

Rental security deposit: (refundable upon termination of services) \$ \_\_\_\_\_

Commercial security deposit: (refundable upon termination of services) \$ \_\_\_\_\_

Industrial Security Deposit: (Refundable upon Termination of Services) \$ \_\_\_\_\_

Water tap fee: (non-refundable materials and labor costs of installing service) \$ \_\_\_\_\_

Road cut fee: (non-refundable extra charge if main is opposite property on dirt or gravel road) \$ \_\_\_\_\_

Road bore fee: (non-refundable extra charge if main is opposite property on paved county road) \$ \_\_\_\_\_

Highway road bore fee: (non-refundable extra charge if main is opposite property on state or federal highway) \$ \_\_\_\_\_

- d. Within two weeks of the execution of the user agreement, \_\_\_\_\_ Water Association shall install the service connection and meter assembly within 10 feet of the road right-of-way or existing private easement nearest the water main and/or install sewer tap and line to within 10 feet of the road right-of-way or existing private easement of the nearest sewer line.

2. Applicants requesting water service to property where **existing water meters**



are present are required to complete the following procedures prior to completing a user agreement:

- a. Applicant shall request the maintenance superintendent to inspect the existing service connection to ensure that all necessary equipment, including the curb stop, meter, meter coupling, meter box and top, are in place prior to executing the user agreement. The maintenance superintendent shall also inspect property as well as system maps to ensure that property is within sewer service area and that an existing sewer main is on or near the property.
- b. If the applicant has moved a mobile home onto the property of an existing water service connection, the applicant shall first obtain the notice of intent from the \_\_\_\_\_ County environmentalist as outlined above in paragraph 1, line b.
- c. The applicant shall then make arrangements to meet the billing clerk order to execute the user agreement, at which time the notice of intent shall become the property of \_\_\_\_\_ Water Association and the applicant pays the applicable following fees:

Membership fee: (non-refundable contributed capital) \$\_\_\_\_\_

Residential security deposit: (refundable upon termination of services) \$\_\_\_\_\_

Rental security deposit: (refundable upon termination of services) \$\_\_\_\_\_

Commercial security deposit: (refundable upon termination of services) \$\_\_\_\_\_

Industrial security deposit: (refundable upon termination of services) \$\_\_\_\_\_

Connection fee: (non-refundable labor costs of connecting service) \$\_\_\_\_\_

B. Meter connections requiring the extension of water or sewer mains

Applicants requesting water and/or sewer service to areas where existing \_\_\_\_\_ Water Association water mains are not present are required to complete the following steps:

1. Obtain a petition for service from the maintenance superintendent, and gather signatures of all individuals and entities who have property within the proposed service extension area and who would also like to be connected to \_\_\_\_\_ Water Association. If the applicant is the only person or entity requesting extension of service, then refer to item 3 below.
2. Upon the completion of the petition for service, the applicant shall present the petition to the board. If the board determines that not all potential customers have been included in the petition for service, the board may require a written explanation as to why these individuals or entities are not included.
3. If the applicant does not require financial aid for the design and construction of the extension, the applicant shall notify the board of the engineer who will provide design and inspection services. The applicant shall be responsible for all costs, including engineering fees, construction costs, and attorney's fees. Any extension outside of the certificate franchised area of \_\_\_\_\_ Water Association will require the applicant petitioning the \_\_\_\_\_ Public Commission



for a service-area extension. All preliminary engineering plans shall be reviewed by the \_\_\_\_\_ Water Association board, its certified operator, and engineer, and the \_\_\_\_\_ Division of Water Supply prior to approval to begin construction. Upon the board's approval of the engineering plans and after the receipt of approval by \_\_\_\_\_ Division of Water Supply's Planning Review Branch, the board shall grant a service-extension agreement and notice of intent to purchase water line extension. After terms and conditions of the service-extension agreement and notice of intent to purchase are completed, the applicant shall sell the extension, final engineering plans, right-of-way easements and other required documentation to \_\_\_\_\_ Water Association for a sum not to exceed \$1.00.

4. If the applicant requires financial aid in order to finance the engineering and construction of the project, \_\_\_\_\_ Water Association will formally request proposals and qualifications from at least five engineering firms. After an engineer is selected by the \_\_\_\_\_ Water Association board and preliminary engineering design and cost estimates are compiled, \_\_\_\_\_ Water Association will coordinate through recognized federal, state, or private lending agencies in order to apply for funding on behalf of the applicant(s). After funding is approved and obligated, \_\_\_\_\_ Water Association will evaluate the cost effectiveness of the project and any increases in existing customer fees. Unless \_\_\_\_\_ Water Association's existing customers will

benefit by the extension and improvements to the water and or sewer system, the board cannot accept funding unless all costs, including additional operations and maintenance costs and debt service expenses, will be borne by the applicant(s). If funding is accepted, the board shall work with the applicant(s) in meeting letters of condition so that construction can begin. If funding is not accepted, the board shall notify the federal/state funding agency as well as the applicant(s) as to the reason funding was not acceptable.

- C. Extensions requiring system upgrades, including the construction of new water wells, pumps, and/or tanks  
Any proposed extension that would require the upgrade of existing \_\_\_\_\_ Water Association facilities, including its existing water mains, wells, pumps, tanks, or sewerage treatment facilities, shall be included in the proposed project. Applicants who do not require federal/state funding assistance will be required to fully pay all costs, including necessary upgrades to \_\_\_\_\_ Water Association existing facilities.
- D. Exceptions, administrative orders  
\_\_\_\_\_ Water Association cannot extend service, connect existing meters for new service, or install new customer meter connections if the water system is near or over capacity and/or if the state has issued an administrative order prohibiting the extension, connection, or installation of new customer service. Only after \_\_\_\_\_ Water Association has complied with the conditions of such an administrative order can the board authorize the extension, connection, or installation of new customers.

## IV. Collection Policy

### A. Collection of customer water payments

1. \_\_\_\_\_ has been contracted by \_\_\_\_\_ Water Association to receive, post and deposit customer water and sewer payments at the following address: \_\_\_\_\_  
\_\_\_\_\_ is hereinafter designated the billing clerk.
2. Customers of \_\_\_\_\_ Water Association should receive a current monthly statement detailing current and past-due water/sewer charges on or shortly after the \_\_\_\_ day of each month. If a customer does not receive a monthly statement, it is the customer's responsibility to contact the billing clerk so that another bill can be mailed. Failure to receive a monthly statement does not relieve the customer of any payment obligation nor prevents the termination of a service connection.

### B. Grievances, payment-extension agreements and hardship agreements

#### 1. Customer grievance

If a customer has a dispute regarding a current bill, the customer must contact the billing clerk to inform him/her of the discrepancy. The billing clerk, after investigating the merits of the complaint, will, in turn, notify the customer of any findings. The billing clerk cannot under any circumstances adjust a water bill. However, the billing clerk must report his/her findings to the board before the **[number]** day of each month. The board will act on testimony from both the billing clerk and the customer at the board meeting and will make any adjustments accordingly. No late charges or service charges will

be assessed after a grievance has been filed. Upon a ruling of the grievance by the board, the customer has **[number]** days to pay the balance in full. If the balance is not received by the billing clerk within **[number]** days of the ruling, applicable late charges and/or service charges will be assessed.

#### 2. Payment-extension agreement

If a customer has a past-due amount reflected on the bill that s/he receives, the customer may appear in person before the billing clerk to file a formal payment-extension agreement, provided that the payment-extension agreement is filed before the \_\_\_\_ of the month. The payment-extension agreement must stipulate full payment of both current and past-due charges and applicable late charges before the end of the month. If the customer does not pay full balance on or before the last day of the month, the payment-extension agreement becomes null and void. If the customer has not fulfilled his/her promise to pay by the end of the month, the customer will not be allowed to file another payment-extension agreement for **[number]** months. Furthermore, if a customer has defaulted on his/her agreement to pay, the service connection supplying water to the customer will be terminated within **[number]** days without any other notice or warning.

#### 3. Hardship payment agreement

If a customer incurs any type of hardship, including a high water bill, loss of employment, loss or damage of property caused by fire or natural disaster, death or illness of family, or any other catastrophe that hinders the customer's ability to pay

his/her full monthly bill, the board may grant a hardship payment agreement. The hardship payment agreement will be granted only if the entire customer's past-due balance has been previously paid. The hardship payment agreement stipulates that at least **[percentage/portion]** of the current monthly minimum be paid before the **[number]** day of each month. The remaining balance of the customer's bill is not forgiven or adjusted but carried over each month with no accumulation of late charges, provided that the customer pays at least the minimum stipulated in the hardship payment agreement before the **[number]** day of each month. The hardship payment agreement is granted for a maximum term of **[number]** months. At the end of the term, the customer may appear before the board to request an extension not to exceed **[number]** additional months. The customer agrees to pay all remaining charges within **[number]** days of the term expiration of the hardship payment agreement. The customer may be entitled to filing a payment extension agreement to extend the full repayment of the balance by the end of the month that the hardship payment agreement expires. Failure of making the minimum payment stipulated in the hardship payment agreement by the end of each month will result in the automatic termination of the hardship payment agreement. **[Number]** calendar months have to elapse before a customer may petition the board for another hardship payment agreement, whether or not the agreement's promises have been fulfilled by the customer.

C. Proof of payment

1. If a customer has a dispute regarding the proper credit and posting of a water

payment, the customer must provide acceptable proof of payment. Proof of payment may consist of one of the following:

- a. Bank canceled check
- b. \_\_\_\_\_ Water Association payment receipt
- c. Statement and photocopy of canceled money order from company issuing money order. (A money order receipt is not proof that the payment was made. This receipt is only proof that a money order was purchased. It should always be retained in the event that a customer needs to request a trace from the company issuing the money order.)

2. It is the responsibility of the customer to notify the billing clerk of any discrepancy, including an improperly credited or missing payment. The billing clerk will notify the customer if s/he cannot find or solve the problem. The customer must appear before the board and either provide proof of payment or request additional time to obtain proof. The undisputed portion of the water statement should be paid before the **[number]** day of the month.

V. Cutoff policy

- A. Billing, late assessments and cutoff notices
  1. \_\_\_\_\_ Water Association reads meters usually between the **[number]** and **[number]** of each month, after which the billing clerk calculates and mails the water/sewer statements. The full balance shown on the statements are due and payable immediately after they are mailed. Failure for a customer to receive





a water/sewer statement does not waive the customer's responsibility to pay all charges included in the statement, nor is this grounds for not charging late charges, service charges, or terminating service.

2. A **[number]** percent late charge of the current balance will be assessed if payment is not received by the **[number]** day of each month.
3. A cutoff notice will be mailed to each customer with any past-due amount still owed after the **[number]** day of each month.
4. Failure of a customer to remit full payment of all current and past-due charges within **[number]** days of the cutoff notice being mailed will result in the customer's service being terminated. Refer to paragraph C below for further explanation.

#### B. Delinquent collections

1. If a delinquent customer has failed to pay his/her entire bill by the date shown on the cutoff notice, the said customer may offer full payment including a **[\$dollar amount]** collection fee. It is the responsibility of the customer to offer payment to the employee or contractor who arrived on-site for the sole purpose to terminate the service connection. Furthermore, the customer must present full payment, including the collection fee, to the employee or contractor within **[number]** minutes of requesting the service connection not be terminated. If the customer is unable to gather the full payment within **[number]** minutes, the employee or contractor shall terminate the service connection without further delay.

#### C. Termination of service

1. If a delinquent customer has had his/her service connection terminated, s/

he must appear before the billing clerk or an authorized board member to make full payment of current charges, past-due charges, late charges, and service charges, to include a **[\$dollar amount]** reconnection fee. After full payment has been received, the delinquent customer can expect his service connection to be restored within **[number]** hours.

2. If a delinquent customer who has had his/her service connection terminated but is receiving water through a meter that has had its locking device tampered with or removed, then the board will file criminal theft of water charges against the customer. The board will also immediately file a civil lawsuit against the customer to seek a judgment to recover all current and past-due water charges, late charges, service charges, charges for damage to the lock and/or meter, and any applicable court costs.

#### D. Bad debts

1. If a delinquent customer has not paid his full balance within **[number]** days after termination of service, the billing clerk shall write a letter to the customer requesting full payment within **[number]** days. The letter shall also state the association's customer service policy and the intent to file a lawsuit against the customer if payment is not received by the specified deadline.
2. If, after **[number]** days of mailing notice concerning a bad-debt balance, and the account still has not been settled, the billing clerk shall apply the customer's security deposit to the balance, print a detailed transaction report for the customer's account over the last six months, and supply this report along with all copies of all correspondence to



the customer since the meter has been terminated, the customer's address, social security number, place of employment and any other recorded information to the board. The board shall then have its attorney prepare a lawsuit to recover the unpaid balance, as well as any other fees that the board or court deems necessary, including but not limited to legal fees and court-filing fees.

3. If a customer owing a bad-debt balance has had his/her deposit applied against the outstanding balance, the customer will be required to complete another water user agreement and post a security deposit equal to twice the amount of the applicable user class deposit for residential, commercial, or industrial customers.

## VI. Implementation, enforcement, and amendments of the customer-service policy

### A. Implementation

The board for \_\_\_\_\_ Water Association has resolved to fully implement the customer-service policy by the **[date]** of **[month and year]**. All employees, contractors, and designees of \_\_\_\_\_ Water Association will be charged with the responsibility of strictly

adhering to the customer-service policy.

The board shall also publicly post or distribute copies of this policy to the customers immediately.

### B. Enforcement

The employees, contractors, and designees of \_\_\_\_\_ Water Association shall enforce the customer-service policy. Every customer of the association will be required to be subject to the same customer-service policy. No preferential treatment of any customer, including members of the board, will be tolerated.

### Approval:

Be it resolved, that the \_\_\_\_\_ Water Association board conducted a monthly business meeting on the **[number]** day of **[month and year]**. Furthermore, that the board, acting upon a motion made and duly seconded, unanimously approved the customer-service policy contained herein the preceding pages.

Be it further resolved that the said policy will remain in force until such time that the board of \_\_\_\_\_ Water Association resolves to amend said policy.

\_\_\_\_\_  
Secretary of the Board

\_\_\_\_\_  
Date

# G3 Code Of Ethics For The Board Of Directors Of The \_\_\_\_\_ System

Issue Date:

Revision Date:

## Statement of commitment

I am a steward of the assets of the \_\_\_\_\_ System. I recognize the need of our customers for competent and committed board members and pledge to perform to the utmost of my abilities. As a board member, I acknowledge and promise to perform my duties in such a manner that customer confidence and trust in the integrity, objectivity and impartiality of the \_\_\_\_\_ System are conserved and enhanced.

## Ethical guidelines

1. I will actively participate in all discussions and voting matters.
2. I am obligated to act in a manner that will bear the closest public scrutiny.
3. It is my responsibility to contribute suggestions to improve policies, standards, practices and actions.
4. I will declare any conflict of interest, real or perceived, with regard to any matter being discussed before the board or during committee meetings, and I will remove myself from all discussions of the matter, in order to further mitigate any real or perceived conflict of interest.
5. I will not knowingly take advantage of or benefit from information that is obtained in the course of my official duties and responsibilities as a board member and that is not generally available to the public.
6. I will be alert to and share information which can be used to develop improved policies and strategies.
7. I will protect information closely, and will not release or share confidential information without the permission (preferably in writing) of the person who provided it.
8. I will maintain the confidentiality of all information which the board deems confidential.
9. I will be mindful of resources that are in my trust on behalf of board business, and will help establish policies that secure and protect board resources.
10. I expect to be reimbursed for legitimate expenses incurred by myself for the sake of board business. I will keep all such expenses reasonable and justifiable and will discuss expenses which may be in question with the board's chair and secretary/treasurer.
11. Should business associates or others offer me gifts, favors, or benefits on a personal basis because of the business \_\_\_\_\_ System does with them, I will recognize that such offers may be an effort to secure advantage from me, and I will reject such offers. The most I am allowed to accept will be normal promotional handouts of nominal value.
12. As a part of my duties as a board member, I represent the \_\_\_\_\_ System formally and informally to other businesses, government officials and the public. I recognize the importance of leaving others with a positive impression. In my duties, I will preserve and



enhance the good reputation of the \_\_\_\_\_ System and will avoid behavior that might damage its image.

## Interpretation, enforcement and penalties

The chair of \_\_\_\_\_ System shall ensure that the practice of this code of ethics will be fair, just and equitable in all situations of interpretation and application. The chair is ultimately responsible for immediate interpretation, application and enforcement of the code of ethics.

Complaints concerning a possible violation of the code of ethics shall be made in writing to or by the chair, and a copy will be provided to the complainant. The chair shall make an initial determination of the issue and shall attempt initial resolution of the problem with the complainer and the complainant. If this initial attempt at resolution is unsuccessful, the chair shall appoint a task force composed of three board members to investigate the complaint and submit a written report to the chair within 30 days. The chair shall render his/her decision within ten days of receiving the task force report.

The chair's decision may be appealed in writing to the board for consideration at the board's next regular meeting for a final decision. The final decision shall be delivered in writing to the complainer and complainant. The complainant may have legal counsel present at the final

hearing. In the instance of a negative decision, should the member file a grievance, the procedure outlined in the current version of *Robert's Rules of Order* shall be utilized.

Should the chair be the subject of a written complaint or have a real or perceived conflict of interest with respect to the complaint, the vice chair shall perform the duties normally assigned to the chair in this matter.

Penalties imposed for violating the code of ethics may include, but are not limited to, the following:

- Exclusion of the board member from portions of future meetings and discussions that relate to the stated conflict of interest, and/or
- Censure of the board member in private, public, or both, and/or
- Removal of the board member from his/her position by a resolution passed by a vote of two thirds of the board, provided that notice of such a proposed resolution is given with the notice calling the meeting.

I have read and I accept the code of ethics for \_\_\_\_\_ System board members and committee chairs.

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

# G4 Cross-Connection Control Policy

## Water Association

Approved:

Amended:

### I. Purpose

- A. To protect the water supplied to the public by the \_\_\_\_\_ Water Association from the possibility of contamination or pollution by isolating within its customers' internal distribution systems such contaminants or pollutants that could backflow or back-siphon into the public water system.
- B. To promote the elimination or control of existing cross-connections, actual or potential, between its customers' in-plant potable water system and non-potable systems.
- C. To provide for the maintenance of a continuing program of cross-connection control that will effectively prevent the contamination or pollution of all potable water systems by cross-connection.

### II. Authority

- A. The federal Safe Drinking Water Act of 1974, and the statutes of the State of \_\_\_\_\_, Chapters \_\_\_\_\_, the water purveyor that has the primary responsibility for preventing water from unapproved sources, or any other substances, from entering the public potable water system.
- B. \_\_\_\_\_ Water Association, Rules and Regulations, adopted [date].

### III. Responsibility

The director of municipal services shall be responsible for the protection of the public potable

water distribution system from contamination or pollution due to the backflow or backsiphonage of contamination or pollutants through the water-service connection. If, in the judgment of the director of municipal services, an approved backflow device is required at the city's water service connection to any customer's premises, the director or his/her delegated agent shall give notice in writing to the customer to install an approved backflow-prevention device at each service connection to his/her premises. The customer shall, within 90 days, install such a device (or devices) at his/her own expense. Failure or refusal or inability on the part of the customer to install such device or devices within ninety (90) days shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.

### IV. Definitions

- A. Air gap:** A physical separation sufficient to prevent backflow between the free-flowing discharge end of the potable water system and any other system. Physically defined as a distance equal to twice the diameter of the supply-side pipe diameter, but never less than one inch.
- B. Approved:** Accepted by the director of municipal services as meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.
- C. Atmospheric vacuum breaker:** A device that prevents backsiphonage by creating an atmospheric vent when there is either a negative pressure or subatmospheric pressure in a water system.



- D. Auxiliary water supply:** Any water supply, on or available, to the premises other than the purveyor's approved public potable water supply.
- E. Backflow:** The flow of water or other liquids, mixtures, or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.
- F. Backflow preventer:** A device or means designed to prevent backflow or back-siphonage. Most commonly categorized as air gap, reduced pressure-principle device, double check valve assembly, pressure vacuum breaker, atmospheric vacuum breaker, hose bibb vacuum breaker, residential dual check valve, double check valve with intermediate atmospheric vent, and barometric loop.
- G. Backpressure:** A condition in which the owner's system pressure is greater than the supplier's system pressure.
- H. Back-siphonage:** The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than the intended source, caused by the sudden reduction of pressure in the potable water system.
- I. Barometric loop:** A fabricated piping arrangement rising at least 35 feet at its topmost point above the highest fixture it supplies. It is utilized in water supply systems to protect against back-siphonage.
- J. Commission:** The State of \_\_\_\_\_ Cross-Connection Control Commission.
- K. Containment:** A method of backflow prevention that requires a backflow-prevention device at the water service entrance.
- L. Cross-connection:** Any actual or potential connection between the public water supply and a source of contamination or pollution.
- M. Department:** The City of \_\_\_\_\_ Water Department.
- N. Director of municipal services:** The person (or his/her delegated representative) invested with the authority and responsibility for the implementation of a cross-connection control program and for the enforcement of the provisions of this ordinance.
- O. Double check valve assembly:** An assembly of two independently operating spring-loaded check valves with tightly closing shutoff valves on each side of the check valves, plus properly-located test cocks for the testing of each check valve.
- P. Double check valve with intermediate atmospheric vent:** A device having two spring-loaded check valves separated by an atmospheric vent chamber.
- Q. Fixture isolation:** A method of backflow prevention in which a backflow-prevention device is located to correct a cross-connection at an in-plant location rather than at a water service entrance.
- R. Hose bibb vacuum breaker:** A device that is permanently attached to a hose bibb and that acts as an atmospheric vacuum breaker.
- S. Owner:** Any person who has legal title to, or license to operate or live in, a property upon which a cross-connection control inspection is to be made, or upon which a cross-connection is present.
- T. Person:** Any individual, partnership, company, public or private corporation, political subdivision or agency of the State Department, agency or instrumentality of the United States, or any other legal entity.
- U. Permit:** A document issued by the department that allows the use of a backflow-prevention device or method.

- V. Pollutant:** A foreign substance that if permitted to enter the public water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of the water to a degree that does not create an actual hazard to public health but that does adversely and unreasonably affect such water for domestic use.
- W. Pressure vacuum breaker:** A device containing one or two independently operated spring-loaded check valves and an independently operated spring-loaded air inlet valve located on the discharge side of the check valve(s). The device includes tightly closing shutoff valves on each side of the check valve(s) and properly located test cocks for the testing of the check valve(s).
- X. Reduced-pressure principle backflow preventer:** An assembly consisting of two independently operating approved check valves with an automatically-operating differential pressure relief valve located between the two check valves, tightly closing shutoff valves on either side of the check valves, plus properly located test cocks for the testing of the check valves and the relief valve.
- Y. Residential dual check valves:** An assembly of two spring-loaded, independently operating check valves without tightly closing shutoff valves or test cocks. Generally employed immediately downstream of the water meter to act as a containment device.
- Z. Water service entrance:** The point in the owner's water system beyond the sanitary control of the district, generally considered to be the outlet end of the water meter, and always before any unprotected branch.

## V. Administration

- A. The department will operate a cross-connection control program that will include the keeping of necessary records in order to fulfill the requirement of the commission's cross-connection control regulations. The commission must approve of the department's program
- B. The owner shall allow his/her property to be inspected for possible cross-connections and shall follow the provisions of the department's program and the commission's regulations if a cross-connection is permitted.
- C. If the department requires that the public supply be protected by containment, the owner shall be responsible for water quality beyond the end of the containment device and should utilize fixture outlet protection for that purpose. The owner may utilize public health officials or personnel from the department (or their delegated representatives) to assist him/her in the survey of the facilities in the selection of proper fixture outlet devices, and in the proper installation of these devices.

## VI. Requirements

- A. Department
  - 1. On new installations, the department will provide onsite evaluation and/or inspection of plans to determine the type of backflow-prevention device or method that will be required. It will issue the permit and perform inspections and testing. A minimum of a dual check valve will be required in any new construction.
  - 2. For premises existing prior to the start of this program, the department will perform evaluations and inspections of plans and/or premises and will inform the owner by



letter of any corrective actions deemed necessary. This letter will include the method of achieving the correction and the time allowed for the correction to be made. Ordinarily, 90 days will be allowed. This time period may be shortened depending upon the degree of hazard involved and the history of the device(s) in question.

3. The department will not allow any cross-connection to remain unless it is protected by an approved backflow-prevention device or method for which a permit has been issued, and which will be regularly tested to ensure satisfactory operation.
4. The department shall inform the owner by letter of any failure to comply by the time of the first re-inspection. The department will allow an additional 15 days for the correction. In the event the owner fails to comply with the necessary correction by the time of the second re-inspection, the department will notify the owner by letter that the water service to the owner's premises will be terminated in a period not to exceed five days. In the event that the owner informs the department of extenuating circumstances as to why the correction has not been made, a time extension may be granted by the department, but in no case will it exceed an additional 30 days.
5. If the department determines at any time that a serious threat to public health exists, the water service will be terminated immediately.
6. The department shall have on file a list of private contractors who are certified backflow device testers. All charges for these tests shall be paid by the owner of the building or property.
7. The department will begin initial inspections

of the premises to determine the nature of existing or potential hazards following the approval of this program by the commission, during the calendar year \_\_\_\_\_. Initial focus will be on high-hazard industries and commercial premises.

#### B. Owner

1. The owner shall be responsible for the elimination or protection of all cross-connections on his/her premises.
2. The owner, after having been informed by a letter from the department, shall at his/her expense install, maintain, and test (or have tested) any and all backflow-prevention devices on his/her premises.
3. The owner shall correct any malfunctions of the backflow preventer that are revealed by periodic testing.
4. The owner shall inform the department of any proposed or modified cross-connections and also of any existing cross-connections of which the owner is aware but which have not been found by the department.
5. The owner shall not install a bypass around any backflow preventer unless there is a backflow preventer of the same type on the bypass pipe. Owners who cannot shut down operations for testing the device(s) must supply additional devices necessary to allow testing to take place.
6. The owner shall install backflow preventers in a manner approved by the department.
7. The owner shall install only backflow preventers approved by the department or the commission.
8. Any owner having a private well or other private water source must have a permit if the well or source is cross-connected to the department's system. Permission



to cross-connect may be denied by the department. The owner may be required to install a backflow preventer at the service entrance if a private water source is maintained, even if it is not cross-connected to the department's system.

9. In the event the owner installs plumbing to provide potable water for domestic purposes on the department's side of the backflow preventer, such plumbing must have its own backflow preventer installed.
10. The owner shall be responsible for the payment of all fees for permits, annual or semiannual device testing, retesting in the case that the device fails to operate correctly, and second re-inspections for non-compliance with department or commission requirements.

## VII. Degree of Hazard

- A. The department recognizes the threat to the public water system arising from cross-connections. All threats will be classified by degree of hazard and will require the installation of approved reduced-pressure principle backflow-prevention devices or double check valves.

## VIII. Permits

- A. The department shall not permit a cross-connection within the public water supply system unless it is considered necessary and it cannot be eliminated.
- B. Cross-connection permits that are required for each backflow prevention device are obtained from the department. A fee of \$[dollar amount] will be charged for the initial permit, and a fee of \$[dollar amount] will be charged for the renewal of each permit.

- C. Permits shall be renewed every [number] years and are non-transferable. Permits are subject to revocation and become immediately revoked if the owner should change the type of cross-connection or degree of hazard associated with the service.
- D. A permit is not required when fixture isolation is achieved with the utilization of a non-testable backflow preventer.

## IX. Existing in-use backflow prevention devices

- A. Any existing backflow preventer shall be allowed by the department to continue in service unless the degree of hazard is such that it supersedes the effectiveness of the present backflow preventer or results in an unreasonable risk to public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a business establishment, any existing backflow preventer must be upgraded to a reduced pressure-principle device, or a reduced pressure-principle device must be installed in the event that no backflow device was present.

## X. Periodic testing

- A. Reduced-pressure principle backflow-prevention devices shall be tested and inspected at least semiannually.
- B. Periodic testing shall be performed by the department's certified tester or his delegated representative. This testing shall be done at the owner's expense.
- C. Testing shall be conducted during the department's regular business hours. Exceptions to this, when at the request of the owner, may require additional charges to cover the increased costs to the department.

- D. Any backflow preventer that fails during a periodic test will be repaired or replaced. When repairs are necessary, the device will be re-tested at the owner's expense upon completion of the repair to ensure correct operation. High-hazard situations will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be repaired immediately. In other situations, a compliance date of not more than 30 days after the test date will be established. The owner is responsible for spare parts, repair tools, or a replacement device. Parallel installation of two devices is an effective means of the owner ensuring uninterrupted water service during testing or repair of devices and is strongly recommended when the owner desires such continuity.
- E. Backflow-prevention devices will be tested more frequently than specified in A. above in cases where there is a history of test failures and the department feels that due to the degree of hazard involved, additional testing is warranted. The cost of the additional tests will be borne by the owner.

## XI. Records and reports

- A. Records—the department will initiate and maintain the following:
1. Master files on customer cross-connection tests and/or inspections.
  2. Master files on cross-connection permits.
  3. Copies of permits and permit applications.
  4. Copies of lists and summaries supplied to the commission.
- B. Reports—the department will submit to the commission the following:
1. Initial listing of low-hazard cross-connections.
  2. Initial listing of high-hazard cross-connections.
  3. Annual update to lists 1 and 2 above.
  4. Annual summary of cross-connection inspections.

## XII. Fees and charges

- A. The department will publish a list of fees or charges for the following services or permits:
1. Testing fees.
  2. Re-testing fees.
  3. Re-inspection fees.
  4. Charges for after-hours inspections or tests.

## ADDENDUM

1. Effective **[date]** for the town of \_\_\_\_\_, all new residential buildings will be required to install a residential dual check valve device immediately downstream of the water meter. Installation of retrofit residential dual check valve devices on existing service lines will be instituted at a time and at a potential cost to the homeowner as deemed necessary by the department. The owner must be aware that the installation of a residential dual check valve device results in a potentially closed plumbing system within his/her residence. As such, provisions may have to be made by the owner to provide for closed-loop expansion (for example, with thermal expansion devices and/or pressure-relief valves) within his/her closed-loop system.
2. The department strongly recommends that all new retrofit installations of reduced-pressure principle devices and double check valve backflow preventers include the

installation of strainers located immediately upstream of the backflow device. The installation of strainers will preclude the fouling of backflow devices due to both foreseen and unforeseen circumstances occurring to the water supply system (such as water main repairs, water main breaks, fires, periodic cleaning and flushing activities,

etc.). These occurrences may dislodge debris within the water main that will cause fouling of backflow prevention devices installed without the benefit of strainers.

Taken from the U.S. Environmental Protection Agency's *Cross-Connection Control Manual*, February 2003, pp. 33-37.

SAMPLE

# Appendix H

## Emergency-Response Planning

Your work as a board member of your utility makes a positive difference in the lives of every member of your community, and you should take pride in that contribution, especially when disaster hits.

### WARN

Disasters are times for which WARNs—Water/Wastewater Agency Response Networks—were developed: neighbor helping neighbor in times of trouble. A WARN will help your utility to prepare for emergencies that affect your system and support the organization of your system’s response to emergencies using established requirements. It will also help you share personnel and equipment statewide by written agreement. While this sounds much more formal than simply lending a helping hand, a WARN is designed to allocate resources efficiently and protect your bottom line in terms of reimbursement for assistance you may provide another system.

Planning ahead for emergency situations can save money in a variety of ways. Obvious savings are in time-related expenses: If you already have a WARN in place, you don’t have to waste time searching for workers, equipment or treatment chemicals. Help can be on its way immediately, rather than waiting for negotiations over wages or for equipment-rental prices to be finalized. And planning for alternative vendors of parts or chemicals can shorten the time that your system is off-line.

Planning ahead also saves money in not so

obvious ways. Developing relationships with other water or wastewater systems in your state provides a local pool of knowledge and experience to draw from at all times, not just during emergencies. Developing relationships with law enforcement and firefighters enables all parties to better understand each other’s concerns. For example, law-enforcement personnel may have valuable insight into effective security practices and be able to provide local information on crime trends that may help you protect your system. Or volunteer firefighters may not understand the reason behind opening and closing hydrant valves slowly, but they would likely understand the importance of an operable hydrant during a fire. Participation in WARN is a great chance to learn from and educate other members of the community.

What price can be put on customer good will? Your customers expect clean water when they turn on a faucet, and they expect that the health of their friends downstream is protected by wastewater treatment. Imagine the peace of mind customers will have knowing you have a contingency plan in the event of an emergency.

In order to start a WARN, the U.S. Environmental Protection Agency (EPA) has identified components of effective programs that can help you develop a model for your system. The EPA uses the term “protective program” to encompass preparation for and responses to natural disasters (like hurricanes or earthquakes), malicious acts, accidents, and other incidents that would adversely affect the operation of your system.

There are ten separate features of programs that are recognized as “active and effective,” regardless of the size of the system:

1. Daily business operations should foster a protective culture throughout the organization to ensure continuity of your services. They should make sure that operators and managers (if your system employs them) are encouraged to bring concerns or ideas for improvement to you or other board members.
2. Protective program priorities and resources should be identified and reviewed at least annually, supported with utility-specific measures and self-assessed using these measures to understand and document program progress.
3. Protocol for contamination detection should be used, while recognizing limitations in current contaminant detection, monitoring, and public-health surveillance methods.
4. Risks and vulnerability assessments should be reviewed annually by the board to reflect changes in potential threats, vulnerabilities and consequences.
5. Access should be restricted to authorized individuals, and you should be able to detect unauthorized physical and cyber intrusions. Access controls can be physical (like fencing, lighting, locks or alarms) or procedural (requiring employees to wear identification badges).
6. Incorporate protective program considerations into procurement, repair, maintenance and replacement of physical infrastructure decisions. Have a plan that includes alternate vendors, an adequate supply of replacement parts and treatment chemicals and emergency power backup.
7. Prepare emergency-response, recovery and business-continuity plans; test and review

plans and regularly update plan(s) annually or more frequently to ensure National Incident Management System (NIMS) compliance and to reflect changes in potential threats, vulnerabilities, consequences, physical infrastructure, utility operations, critical interdependencies, and response protocols in partner organizations.

8. Forge reliable and collaborative partnerships with first responders, managers of critical interdependent infrastructure, other utilities and response organizations to maintain a resilient infrastructure.
9. Develop and implement strategies for regular, ongoing communication with employees, customers and the general public to increase overall awareness and preparedness for response to an incident. This step may entail pre-written press releases, updates to your website, or other methods.
10. Monitor incidents and available threat-level information and use protective procedures in response to relevant threats and incidents.

The short version of these ten features is: Know your system, be prepared for emergencies ahead of time, and know where to get help if needed.

Nearly every state has an active WARN. The American Water Works Association (AWWA) produces an online map of the status of North American WARN activities at <http://apps.awwa.org/EbusMain/Default.aspx?TabID=283>. You will notice that on this map, even some Canadian provinces are members of WARN. There is also a list of state WARN contacts at <http://apps.awwa.org/ebusmain/WARN/Region1.aspx>. Note that WARNs apply only within a single state (or province).

If your closest neighbors in times of need are across state lines, an Emergency Management Assistance Compact (EMAC) is your best



option. All 50 states participate in EMAC. More information on EMAC can be found at [www.emacweb.org](http://www.emacweb.org). Even if your system is not a public utility, your state may have mechanisms in place that will allow your participation in an EMAC.

## Vulnerability assessment

You can perform a **vulnerability assessment** on your system without a PhD in mathematics. First, think of the annual weather in your area. Consider how many days weather-related issues affect the quality of water your system delivers or the ability of your wastewater treatment system to perform effectively. Past experience with problems like these is the first step in a vulnerability assessment.

If you are new to your area, help in determining the frequency of occurrences of weather-related hazards is available online. The National Oceanic and Atmospheric Administration (NOAA) website provides climate information across the United States specific to the water/wastewater industry at [www.climate.gov/#dataServices/climateAndYou/water](http://www.climate.gov/#dataServices/climateAndYou/water). See [www.ncdc.noaa.gov/oa/climate/regionalclimatecenters.html](http://www.ncdc.noaa.gov/oa/climate/regionalclimatecenters.html) for regional climate center information. A section of NOAA's website is dedicated to emergency planners and gives advance notice of weather-related hazards. For more information, see .

The weather-related risk for your system on an annual basis might look something like this:

- Heavy snows: 14 days/365 days = 0.04
- Freezing temperatures: 48 days/365 days = 0.13
- Flooding (system-wide): 1 day/365 days = 0.003
- Flooding (localized): 12 days/365 days = 0.03
- Tornadoes: 5 days/365 days = 0.01
- Excessively hot temperatures (over 100 degrees F): 17 days/365 days = 0.05

Next, imagine which components of your system may be affected by each of the above conditions. Heavy snow may cause an old roofing system on a pump house to collapse, damaging your pumps. A tornado may destroy your water tank. Flooding may cause contamination in your well field or destroy your customer records.

The third step is determining how critical each component of the system is, using criteria particular to your system, and giving each a numerical value. If the loss of the equipment would cause a total failure in the delivery of water to your customers, you may want to give this a value of 10. If the loss would cause health problems so severe that some customers may die, that may also be a 10. If the loss would cause a problem with fulfilling regulatory requirements, that might be an 8.5. If the loss isn't critical in terms of operation but would adversely affect public trust in your system, it might be a 7.

Finally, multiply these three numbers to come up with the vulnerability ranking for a particular component of the system. Take a tornado destroying the water tank as an example:

Annual risk of tornadoes (0.01) x complete loss of tank (10) x criticality of no storage (9.5) = 0.95.

It's fairly easy to set up a spreadsheet for these calculations for your equipment and structures. When you reach a number associated with component vulnerability, you can prioritize how to protect your system from disaster and negotiate a WARN with clear objectives of what assistance will best serve your system's needs.

For more information on vulnerability assessments:

- Emergency Response Plan Guidance for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, available at <http://water.epa.gov/infrastructure/watersecurity/>



*upload/2004\_04\_27\_watersecurity\_pubs\_small\_medium\_ERP\_guidance040704.pdf.*

- RCAP has produced a security publication for small systems—the Security and Emergency Response Planning Toolbox for Small Water and Wastewater Systems. It is available online at [www.rcap.org/toolbox](http://www.rcap.org/toolbox).
- The EPA's updated version of 2005's Tabletop Exercise Tool for Water Systems: Emergency Preparedness, Response, and Climate Resiliency (TTX Tool). For more details, see [http://yosemite.epa.gov/ow/SReg.nsf/description/TTX\\_Tool](http://yosemite.epa.gov/ow/SReg.nsf/description/TTX_Tool).
- The Water Environment Research Foundation's (WERF) Emergency Response Plan Guidance for Wastewater Systems, available at [www.werf.org/pdf/03CTS4S.pdf](http://www.werf.org/pdf/03CTS4S.pdf)
- More information on emergency and incident planning from the EPA at <http://water.epa.gov/infrastructure/watersecurity/emergplan>

## Emergency-response plans

Robert A. Heinlein wrote, "When in danger or in doubt, run in circles, scream and shout." But that advice probably won't help your water or wastewater system in times of trouble, and you certainly don't want your customers to see that! The key to any emergency is to be prepared so you can act calmly and decisively when the time comes.

There are eight basic elements of emergency-response plans:

1. Know your system's information.
2. Establish roles and responsibilities.
3. Establish and use communications procedures.
4. Make sure your personnel are as safe as possible.

5. Identify alternative water sources.
6. Plan for replacement equipment and chemical supplies.
7. Protect your system's property.
8. Perform water sampling and monitoring.

Under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, emergency-response plans have been required for systems serving more than 3,300 people since 2004. But planning for an emergency is common sense for any water or wastewater system, no matter what the size.

"Know your system's information" seems like elementary advice. After all, you run your system, so who knows it better? But imagine what would happen if an earthquake not only toppled your office space but also destroyed your computer system. Would you be able to replicate the information from memory, or do you have a backup elsewhere? If you were hurt or killed in the emergency, think about how others would be able to provide clean drinking water or treat wastewater properly.

It's a good idea to have a complete equipment list and map of your distribution or collection system stored in two or three secure areas. If you use asset-management software, you've probably already done this. If not, you should create a spreadsheet or database with a list of the manufacturer, serial number, date of purchase, vendor name, and contact information for every piece of equipment, including meters, pumps, valves and tanks. Include backup systems and interconnections with other systems, if applicable. Date the list and the system map so that you'll know when they were created. Then make at least two copies—one for your office and one for your local officials or system's owner to keep in a separate, secure location. Update and redistribute it at least once a year.



Knowing your system also includes understanding your water quality and quantity and the reasons they may change. Seasonal events, such as high turbidity caused by precipitation runoff, are fairly predictable, but other changes can occur during an emergency. Consider how you would know if your drinking water quality was compromised. The answer to these questions might vary depending upon the emergency, but thinking about it in advance will help you prepare a response.

One example of an emergency situation with poor planning and preparation occurred right after Hurricane Katrina hit the Gulf Coast. Much of the problem with the response to that natural disaster was traced back to inadequate planning and backup communications at various levels.

## Designating leaders

Your system should have a designated emergency-response lead (ER lead) and an alternate ER lead. These people are required to be reachable 24 hours a day, 7 days a week. The ER lead is responsible for evaluating the emergency and changing conditions, managing staff and resources, and deciding on response actions. The ER lead is also the main point of contact for the system and first responders or critical customers (such as hospitals, shelters, nursing homes, power providers, and other entities that may depend on your services especially during emergencies).

Your state may use the Incident Command System (ICS) in times of emergency, and you should at a minimum be familiar with it. An introduction to the ICS for Public Works Personnel (IS-100PW) may be found at <http://training.fema.gov/EMIWeb/IS/is100PWb.asp>. Even if your water or wastewater system is not a public utility, this course is probably the most appropriate for you. ICS for Single Resources and Initial Action Incidents (IS-200.a) may be found at <http://training.fema.gov/emiweb/is/is200b.asp>.

This course is intended for leaders who will be assuming a supervisory role during an emergency. And NIMS Awareness Training (IS-700), found at <http://training.fema.gov/emiweb/is/is700a.asp>, is designed for people with a direct role in emergency preparedness, incident management, or response. IS-100PW is a prerequisite for the other two courses.

There are three separate components to **communications**: 1) with staff (internal); 2) with police, firefighters, and other first responders; 3) with the media and the general public (external). If possible, a person other than the ER lead and alternate ER lead should handle communications during an emergency. The communications lead should contact staff and talk to the media and the public. The communications lead should be in close contact with the ER lead or else the communications will be confusing and pointless, and messages and what's actually happening could easily conflict. Communications from a utility, especially to external audiences (the media, customers, the public), must be clear, and the only way to achieve this is for the communications lead to work closely with the ER lead.

Staff contact information should include telephone numbers for land lines and cell phones, pagers, and street addresses for everyone who could respond during trouble. This list should be updated a minimum of twice a year.

A strategy you might find helpful is creating pre-written news releases for various emergencies that may happen to your system, such as line breaks, flooding, or weather-related natural disasters. You could write news releases with blanks to fill in for the area affected by the event and the estimated time for recovery to a fully operational system. This saves time (and face) in giving the media information and shows that you have prepared for the problem ahead of time and are working diligently to solve it.





## Prepare individuals

Training is the most important part of keeping employees safe in an emergency. Training may help employees evaluate a hazardous situation and approach it with appropriate knowledge and caution. A thorough training addresses topics including confined-space entry, lockout/tagout, electrical hazards, trenching and excavating safety, and more. The Occupational Safety and Hazard Administration (OSHA) has information freely available at <http://osha.gov/SLTC/emergencypreparedness/index.html>.

Personal protective equipment should be ready for use and kept in an area that will be accessible during the hazard. Designate safe assembly areas and shelters for use during emergencies so that you can keep track of the people working for you. Run an evacuation and assembly drill annually. Your employees will take comfort knowing where to go and what to do if the unexpected occurs.

## Thinking ahead of alternate plans

Imagine a disaster destroys your entire treatment system. Planning for alternate water delivery and wastewater treatment ahead of time will save you enormous amounts of work and help your customers recover from the disaster by giving them confidence in your system. Consider providing bottled or bulk water at a centralized location, connecting to another system on a temporary basis, or buying water from private well owners who were unaffected by the emergency.

The time to think about replacement parts and chemicals is before an emergency happens. Negotiations to provide parts or chemicals with other systems that use the same pumps, motors, or other equipment as your system uses may be possible. Also think about a failure of the delivery system that provides you with these items—a

flood washing out a highway, or a rail line breaking. Be sure to plan for alternate delivery methods.

## Human-caused emergencies

It is also important to protect your system's property against intentional acts of vandalism. Local or federal law enforcement may require you to preserve crime scene evidence, follow chain of custody, and to restrict access to the site so they can perform an effective investigation. You will probably want to consult with your local law enforcement people to understand what they may require in this type of situation.

In 2008, the EPA developed the Water Laboratory Alliance (WLA), a network of laboratories within each of the ten EPA regions to support monitoring, surveillance and remediation when water is contaminated, either intentionally or unintentionally. If your system is currently doing in-house lab analysis for water quality or wastewater treatment, you should know that the WLA is available to you as a backup in emergency situations. For more information on the WLA, go to <http://water.epa.gov/infrastructure/watersecurity/wla/index.cfm>. Don't forget to include a provision for obtaining replacement sample bottles and other containers in your emergency-response plan. You may also want to designate alternate sampling sites if the primary ones have been adversely affected by the event.

## Certifying and evaluating your plan

Once you've completed this work, you may want to certify your emergency-response plan with the EPA. See [http://water.epa.gov/infrastructure/watersecurity/upload/2004\\_12\\_20\\_watersecurity\\_pubs\\_seven\\_easy\\_steps.pdf](http://water.epa.gov/infrastructure/watersecurity/upload/2004_12_20_watersecurity_pubs_seven_easy_steps.pdf) for instructions on how to do this. This certification is mandatory for systems that serve more than 3,300 customers, but is also a good idea for very small systems. Not only is it a concrete way to demonstrate your

responsiveness to your customers, but reviewing your plan may also turn up items you hadn't considered including.

Now that you have made an emergency-response plan for the different situations that your system may face, it must be evaluated. Choose one weather-related emergency and run a drill to see how well your plan works. It's best to perform the drill with your workers using the ICS, activating your emergency communications chain and going out into the field to carry out emergency shutdowns and re-starts of equipment. However, if this is not practicable with your situation, a tabletop drill should be done. If problems arise that you haven't foreseen, change the plan, run the drill again, and evaluate it once more.

## Case Study: Greensburg, Kansas

Kansas is located in the middle of Tornado Alley, and the damage and destruction caused annually by these storms is in the millions of dollars. In May 2007, Greensburg, Kansas, was hit by an F4 tornado that totally destroyed the town. Valves, meters and hydrants were buried under tons of debris, and electrical power was down.

Mutual assistance crews worked to mark the location of water infrastructure and restore power to one working well and a communications tower. But emergency-management officials insisted that the crews stop this work to first restore power to streetlights at the courthouse where their command post was located. At that point, Bill Callaway of the Kansas Mutual Energy Agency (KMEA) realized they needed the help of the Kansas Rural Water Association (KRWA). He needed other utility people to work together on disaster planning as well as utility restoration.

The mutual aid water teams located, flushed and disinfected lines to four critical customers around Greensburg and eventually restored service to the town. Besides KMEA and KRWA, employees from the Kansas Department of Health and Education pitched in to help with the project.

Lessons learned from this disaster include:

- Emergency planning takes input from all providers of essential services. What seems like common sense to you might not to someone else.
- Priorities for service restoration should be clearly identified and communicated in writing to all stakeholders.
- Money and time can be saved if critical infrastructure is marked prior to an emergency.



## Case Study: West Point, Georgia

West Point is located on the Georgia-Alabama border. Its water system serves about 4,600 people. The water treatment plant runs only in the daytime. One morning in November 2006, the operator starting up the plant noticed unusual foaming and a granular substance in the troughs between the sedimentation basins and the filters. He shut down the plant immediately and notified the local police department and the Georgia Environmental Protection Division. Subsequent water testing showed phosphate at ten times the normal level.

But what to do about providing water? West Point had a 1-to-1 mutual aid agreement with Lanett, Alabama, which provided for emergency water service through an 8-inch connection. However, the valve to this connection was frozen shut, and neither city had the expertise or the equipment to open it. Assisted by the Georgia Association of Water Professionals and neighboring cities of Columbus and LaGrange, the valve was unstuck and water was provided to West Point customers without interruption.

Lessons learned from this incident include:

- An observant operator is invaluable.
- Valve exercising on a regular schedule can save time and money in an emergency.
- Planning for alternative water service is vital—you never know when you'll need it.
- Employee training and equipment availability should be negotiated with your neighbors in the event your system is unable to provide them.

## Partial list of references

EPA web page: *Features of an Active and Effective Protective Program for Water and Wastewater Utilities*, [www.epa.gov/safewater/watersecurity/pubs/brochure\\_watersecurity\\_featuresofanactiveandeffective.pdf](http://www.epa.gov/safewater/watersecurity/pubs/brochure_watersecurity_featuresofanactiveandeffective.pdf)

EPA, *Water Laboratory Alliance fact sheet*, October 2008, [www.epa.gov/safewater/watersecurity/pubs/fs\\_watersecurity\\_waterlaballiance.pdf](http://www.epa.gov/safewater/watersecurity/pubs/fs_watersecurity_waterlaballiance.pdf)

Knupp, Dan. "Mutual Aid Brings Relief," *Water & Wastes Digest*, volume 48, number 1, January 2008.

Rammo, Amy. "Georgia Water Incident Emphasizes the Need for Mutual Aid and State WARN," *ASDWA Security Update*, volume 6, issue 2, Spring 2007.



# Appendix I

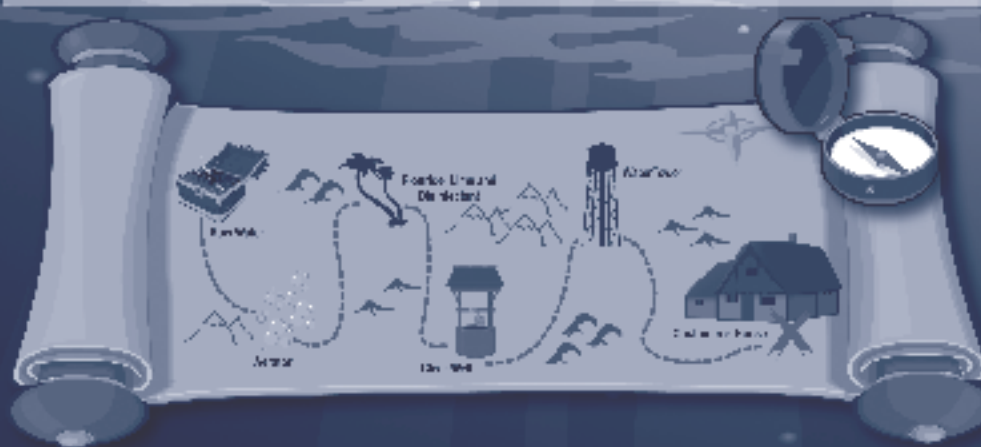
## Sample Consumer Confidence Report



## COMING TO A FAUCET NEAR YOU!

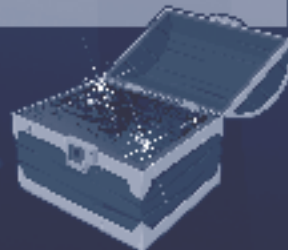
When you turn on the tap, how do you think the water gets to you? In some areas, the water is pumped from a reservoir or lake to a treatment plant and then pumped again to the city's water supply. Or, water flows from the water table through an aquifer and a spring, or falls from 250 to 450 feet deep through a well. In some parts of the world, the water flows through a natural network of underground pipes.

But in some regions, it takes nature a long time to provide the water. In some parts of the world, the water is pumped from a reservoir or lake to a treatment plant and then pumped again to the city's water supply. Or, water flows from the water table through an aquifer and a spring, or falls from 250 to 450 feet deep through a well. In some parts of the world, the water flows through a natural network of underground pipes.



As you walk through the woods, the water is wrapped from underground pipes and is pumped to a treatment plant. It is then pumped to a reservoir or lake. The water is then pumped to a treatment plant and then pumped again to the city's water supply. Or, water flows from the water table through an aquifer and a spring, or falls from 250 to 450 feet deep through a well. In some parts of the world, the water flows through a natural network of underground pipes.

## KEEPING THE TREASURE SAFE!



To help keep our water clean and free from harmful contaminants, and to help protect our water resources, we use a variety of methods to filter the water. This helps us remove sediment from the water and also ensures that all bacteria and viruses are removed.

You can also help protect our drinking water by not pouring household chemicals down your drain. These chemicals can get into the water table and then get into the water supply. Some chemicals include lead, mercury, and other heavy metals. These can be harmful to the water supply and can also be harmful to the environment. To help protect our drinking water, we use a variety of methods to filter the water. This helps us remove sediment from the water and also ensures that all bacteria and viruses are removed.

# Appendix J

## Planning

Planning is used to improve the welfare and lifestyle of people and their communities by creating more convenient, equitable, healthy, efficient, and attractive conditions. These goals are reached in part through the services of providing drinking water. Planning helps a water system to prevent, mitigate or respond to anticipated events. Planning is also a process used to steer a water system toward a particular condition in the future. Planning can be used to improve and stabilize a water system's technical, managerial and financial capabilities. The Safe Drinking Water Act calls this capacity development. It is important to keep in mind that planning concepts, processes and ideal outcomes apply to all water-service providers whether or not they are regulated as a U.S. Environmental Protection Agency-defined water system.

Capacity-development programs are a means to help drinking water systems improve their financial management, administration, infrastructure and operations so they can provide drinking water that is safe, consistent, reliable, and cost-effective. More specifically, the federal capacity-development program provides a flexible framework within which regulators (states, tribes and territories) and water systems can work together to ensure that systems acquire and maintain the technical, financial and managerial capacity to consistently achieve the health objectives of the 1996 Safe Drinking Water Act. Planning and plan implementation is the primary means of acquiring and maintaining technical, financial and managerial capacity.

Planning is often confused with visioning or engineering. Visioning is the process of defining

a system's desired future condition. Engineering comes about only when implementing the technical or infrastructure-related parts of a plan. Plans are written documents that lay out a path to get from the present condition to the desired future condition. A lack of planning also lays a path to a future condition, but rarely is that future condition a desirable one. Responding to and attempting to mitigate undesirable situations brought about by a lack of planning or lack of plan implementation can be unnecessarily expensive and stressful.

### Planning considerations

The plans your water system chooses to develop depend on what risks your system most often faces and on what situations could cause the most detriment to the public or financial health of your system or community. Therefore, one of your considerations will be what internal and external risks your water system could encounter and which of those would be most likely. Some plans, such as emergency-response plans, are mandated by law for certain water systems. If not already completed, required plans should be some of the first plans your water system develops. Be aware that you may need to involve additional staff, managers, elected officials, board members, volunteers and community members to help identify risks/concerns and to help develop your plans. You may also have opportunities to involve technical assistance providers (such as RCAP field staff) at no or low cost or to involve consultants.

One challenge your water system may face is understanding the legal structure of your

organization, including legal obligations and restrictions. This can be particularly challenging for very small water systems whose board members frequently change or whose records have been lost over the years. Sometimes water system operators do not understand their legal structure until they have invested time and money into funding applications, only to find out they are not eligible to receive those funds. Being sure of your system's legal structure and understanding the requirements of that legal status should be done before or at the very beginning of a planning effort.

Some examples of legal structures include: municipality, water authority, water association, water cooperative, water district, private corporation, private sole proprietorship, and various other state- or tribe-specific types of water entities. Other legal requirements, such as minimum operator certification requirements and compliance with the Safe Drinking Water Act, may depend on the size of your system or the type of water treatment used rather than on your legal structure. Water systems must meet the legislative requirements under which they are organized, whether or not they are an entity regulated under the Safe Drinking Water Act. Water organizations that meet certain requirements are regulated either directly by the EPA or by those states, tribes, or territories that have "primacy," which is the authority to regulate on behalf of the EPA. Entities regulated under the Safe Drinking Water Act have different requirements depending on whether they serve transient or stable populations of people.

Understanding your water system's legal structure will help you identify the minimum requirements for public involvement in a planning process. If your water system is a governmental agency, your state or tribe most likely specifies standard procedures for public involvement. Some water-service providers have no public-involvement requirements. How much you involve the public beyond the minimum requirements will depend on

the nature of the planning document, the nature of your organization (how your organization is incorporated), and the interest of your customers, community members and stakeholders.

Planning documents usually involve the implementation of a vision rather than adoption of a vision. Community "comprehensive plans" and "master plans," however, generally do involve adoption of a vision, and case law in recent years has supported recognition of comprehensive plans as law. What this means is that land use and development decisions must be consistent with the adopted comprehensive plan. And what this, in turn, means is that land acquisition for water rights in your long-term water supply plan and extension of new service in your infrastructure capital-improvement plan must be consistent with your community's comprehensive plan, if one is adopted.

In many places in the United States, drinking water is provided as a public service by a governmental entity or a nonprofit organization. Sometimes the desire to provide a low-cost service undermines responsible stewardship of the system, such as with inadequate maintenance or failing to provide for routine and predictable expenses. To break the cycle of premature infrastructure deterioration and/or systems habitually in emergency funding situations, you can adopt a business approach where all system costs are considered in short- and long-term revenue and funding strategies.

As mentioned before, plans are written documents that lay out a path to get from the present condition to the desired future condition. Therefore, the first set of information you need is the system's present condition, which will be specific to the type of plan you want to develop. For example, for a long-term water-supply plan, you will need to know such information as current population, current water use, and current access to water (water rights). If "present-condition"



information like this is needed in a plan, the minimum standards in this guide will indicate what is needed.

Information you need may include:

- legal documents
- previous plans
- demographic data
- economic data
- water system data
- maps
- other geographic-based information, such as drought reports and site-specific hydrologic information

Places to look for needed information may include:

- water system records
- current board members or elected officials
- previous board members or elected officials
- consultants who have recently done work for the system may have gathered useful information
- other local water-service providers, particularly if they have recently developed plans
- local high schools, community colleges, or universities that may have students or faculty who have done relevant research papers or projects
- planning districts/planning organizations (sometimes called council of governments or other state- or tribe-specific names)
- economic-development districts
- business-development advisers
- state or tribal drinking water regulatory agencies
- other state or tribal agencies (utility, water

rights, local government assistance, or funding agencies)

- associations for the water industry (professional, trade, training, education)
- United States Environmental Protection Agency (USEPA) and its regional offices
- United States Geological Survey (USGS)
- United States Army Corps of Engineers (USACE)
- United States Bureau of Reclamation
- Local Government Environmental Assistance Network
- Municipal League
- Rural Community Assistance Partnership (RCAP) and its regional affiliates
- Rural Water Association and its state affiliates
- USEPA Small Drinking Water System Technical Assistance Centers
- USEPA Environmental Finance Centers

Some of the entities listed above may not have data but may have other tools, such as computer programs, detailed guidebooks, and/or detailed templates for writing planning documents.

If you need to compile information from scratch, try to make it as comprehensive and flexible as you can. For example, if you are going to develop a map for the purpose of preventative maintenance, try to include any known repair history or leak-detection results along with the type, size, and location of infrastructure. Consider choosing a format that will allow you to later add more information (like backflow devices for a cross-connection control program) and other types of information (like land use for a source water protection plan). You don't have to worry about getting all the information in your first map, but you will probably want to choose





something flexible that will work for you on more than just one plan.

Mutual aid agreements can be incorporated into or referenced in your planning documents. Mutual aid agreements are set up to share resources (supplies, equipment, labor, funding, or natural resources) between or among entities. Mutual aid agreements will affect elements of a particular plan. For example, an emergency supply plan would look very different for a system with multiple water sources and redundancies in storage and distribution than a plan for a system with a single water source and a mutual aid agreement. Mutual aid agreements should be in writing.

## Plan implementation

Creating the most comprehensive planning document will not do anything to improve or

maintain your system's technical, financial, and managerial capacity if it sits on a shelf, gets buried in a drawer, or is discarded by someone who doesn't understand its value. Make sure decision-makers, managers, personnel, volunteers and other departments or agencies on whom your plans depend are familiar with your system's planning documents and have the resources and training to implement them. Take action when needed, and create a budget for action in a reasonable time frame. Where a plan of action is contingent on certain events (such as an emergency water supply plan), practice a mock event so that everyone involved will be comfortable with their responsibilities if and when the need for real action happens.

## Other RCAP resources to help in the oversight, management and operations of water systems

### Publications

If you are a board or council member or staff with responsibilities for overseeing your community's water system, the Rural Community Assistance Partnership (RCAP) has produced many other publications to assist you in these responsibilities. These publications are titled/on the topics of:

- *A Drop of Knowledge: The Non-operator's Guide to Drinking Water Systems*
- *A Drop of Knowledge: The Non-operator's Guide to Wastewater Systems*
- *The Basics of Financial Management for Small-Community Utilities*
- *USDA Rural Utilities Service Borrower's Guide: A How-to for Water and Wastewater Loans from USDA Rural Development*
- *ARRA Registering and Reporting Guide for Water/Wastewater Systems with Loans/Grants from the U.S. Department of Agriculture-Rural Utilities Service*
- *Sustainable Infrastructure for Small System Public Services: A Planning and Resource Guide*
- *Formulate Great Rates: The Guide to Conducting a Rate Study for a Water System*
- *Getting Your Project to Flow Smoothly: A Guide to Developing Water and Wastewater Infrastructure*
- *Water Quality and Operation and Maintenance of Distribution Systems*
- asset management and conducting vulnerability assessments and emergency-response planning

All of the above publications can be accessed and downloaded (in PDF) on the RCAP website at [www.rcap.org](http://www.rcap.org) (click on "Publications & Resources" on the main menu).

### Other web-based resources

Some of the above publications have multimedia supplements that offer additional insights and help on some of the topics discussed in the publications. These multimedia resources can be used in group trainings or by individuals. Links to the supplements are provided with the publications at the website above.

### Free resources that can be sent to you regularly

RCAP has a magazine—*Rural Matters*—that is produced several times each year. Subscriptions are free. Included in each issue are articles that are useful to small community leaders and system operators. RCAP also produces an electronic newsletter, the eBulletin. Subscribing by email is also free. Each issue provides helpful tips, guides and resources on practical subjects. Find subscription information for both of these resources at [www.rcap.org](http://www.rcap.org) (click on Publications & Resources).



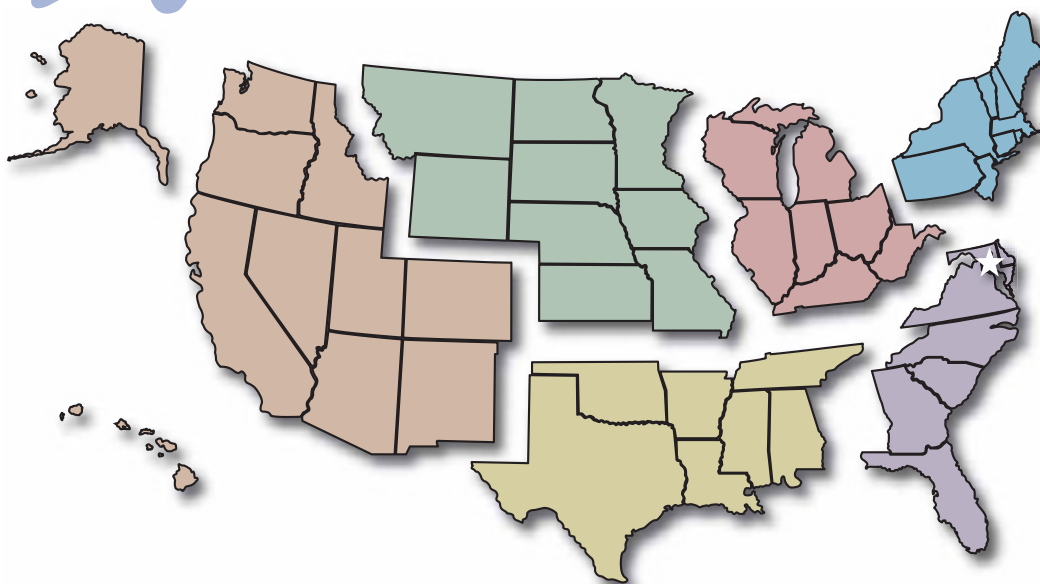
# Need help with your community's water or wastewater system?

The Rural Community Assistance Partnership (RCAP) is a national network of nonprofit organizations working to ensure that rural and small communities throughout the United States have access to safe drinking water and sanitary wastewater disposal. The six regional RCAPs provide a variety of programs to accomplish this goal, such as direct training and technical assistance, leveraging millions of dollars to assist communities develop and improve their water and wastewater systems.

If you are seeking assistance in your community, contact the office for the RCAP region that your state is in, according to the map below. Work in individual communities is coordinated by these regional offices.



## Rural Community Assistance Partnership



### Western RCAP

#### **Rural Community Assistance Corporation**

3120 Freeboard Drive, Suite 201  
West Sacramento, CA 95691  
(916) 447-2854  
[www.rcac.org](http://www.rcac.org)

### Midwest RCAP

#### **Midwest Assistance Program**

P.O. Box 81  
212 Lady Slipper Avenue NE  
New Prague, MN 56071  
(952) 758-4334  
[www.map-inc.org](http://www.map-inc.org)

### Southern RCAP

#### **Community Resource Group**

3 East Colt Square Drive  
Fayetteville, AR 72703  
(479) 443-2700  
[www.crg.org](http://www.crg.org)

### Northeast RCAP

#### **RCAP Solutions**

P.O. Box 159  
205 School Street  
Gardner, MA 01440  
(800) 488-1969  
[www.rcapsolutions.org](http://www.rcapsolutions.org)

Puerto Rico  
(Northeast RCAP)  
and U.S. Virgin  
Islands (RCAC)

### Great Lakes RCAP

#### **WSOS Community Action Commission**

P.O. Box 590  
219 S. Front St., 2nd Floor  
Fremont, OH 43420  
(800) 775-9767  
[www.glracap.org](http://www.glracap.org)

### Southeast RCAP

#### **Southeast Rural Community Assistance Project**

P.O. Box 2868  
347 Campbell Ave. SW  
Roanoke, VA 24016  
(866) 928-3731  
[www.southeastrcap.org](http://www.southeastrcap.org)

### ★ RCAP National Office ★

1701 K Street NW, Suite 700 • Washington, DC 20006  
202/408-1273 • 800/321-7227  
[www.rcap.org](http://www.rcap.org)



Rural Community Assistance Partnership, Inc.  
1701 K St. NW, Suite 700  
Washington, DC 20006  
202/408-1273  
800/321-7227 (toll-free)  
info@rcap.org

[www.rcap.org](http://www.rcap.org)

Visit our website for other publications, electronic and print periodicals, and ways your community can get assistance with its water and wastewater system.