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Rural and Small Systems Guidebook to Sustainable Utility Management

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INTRODUCTION

Background & Purpose

Many rural and small systems throughout the country struggle with various issues, which may include aging or inadequate infrastructure, difficulties recruiting or retaining qualified staff, growing or establishing financial reserves, and setting rates that are reflective of their operational costs.

This *Rural and Small Systems Guidebook to Sustainable Utility Management (Guidebook)* is an important part of a Memorandum of Agreement (MOA) signed by the United States Environmental Protection Agency (EPA) and the United States Department of Agriculture (USDA) in 2011 to jointly support a series of activities to help rural and small water and wastewater systems address various issues and more effectively provide sustainable services to the communities they support. As part of this MOA, EPA and USDA hosted a series of four, day-long pilot workshops, which included participants from over 60 rural and small water providers, in cooperation with local sponsors dedicated to small water and wastewater system management. The first workshop was held in Acme, Michigan, in cooperation with the Michigan Rural Water Association, the second in Santa Cruz, California, in cooperation with the Rural Community Assistance Corporation, the third in Helena, Georgia, with the Georgia Rural Water Association, and the fourth in Nashville, Tennessee, with the United South & Eastern Tribes.

The workshops were designed as a pilot project with the intent of each workshop building off of previous ones. Their goal was to provide information to help address rural and small water and wastewater system management concerns and improve rural and small system operations. At each workshop, participants were given an introduction to the management areas described in more detail in this guide, and then were asked to do a short self-assessment of their operations based on the management areas. Participants also identified management improvement opportunities at their systems based on the assessment, and shared experiences from their systems to better understand how to approach implementing the identified improvements and provide a basis for working with staff and community members to operate more effectively. Participants also provided feedback to EPA and USDA on the usefulness of the information used and exercises undertaken during the workshops. Finally, participants were introduced to a compendium of resources that could help them implement the improvements identified during the assessment.

Based on the approaches used in these workshops and feedback from the workshop participants, the *Guidebook* is designed to introduce rural and small water and wastewater systems to the key areas of effectively managed systems. It provides background information on ten key management areas, as well as instruction and assistance on how to conduct a system assessment process based on the key management areas. It also includes information on how to prioritize areas for improvement, while developing measures of progress that can help small systems with performance improvement. In addition to the *Guidebook*, a companion resource was developed for those who wish to host their own workshop. The *Workshop in a Box: Sustainable Management of*

Rural and Small Systems Workshops kit provides guidance for workshop preparations, execution, and copies of all materials necessary to run a successful workshop on utility management improvement.

The *Guidebook's* aim is to support rural and small water and wastewater systems in their common mission to become more successful and resilient service providers. Because of its dynamic nature, this resource can be used effectively in many different ways:

- By system managers, water systems operations specialists and staff as a guide for taking actions leading to short- and long-term improvement to system management and performance;
- By service providers as they work with individual systems or groups of systems through workshops or other assistance efforts;
- As a resource for system improvement workshops, like those sponsored by USDA and EPA;
- As a resource for guiding conversations about sustainability with utility board members; or
- As a resource for communicating and educating utility board members on the importance of effective management.

The information presented in the *Guidebook* draws on the results of four workshops conducted by EPA and USDA described above, as well as feedback from managers of rural and small systems that attended those workshops. Additionally, several small systems and water systems operations specialists provided input to this guide as it was developed.

The *Guidebook* begins by introducing each of the ten key management areas of effectively managed systems, followed by a self assessment to help users identify their strengths and challenges to prioritize where to focus improvement efforts. The *Guidebook* ends by discussing improving outcomes in the ten management areas by examining what constitutes high achievement in each area, and identifying resources for small systems. The overall approach and steps described in this *Guidebook* are similar to the approach in another initiative, called Effective Utility Management, which has been supported by EPA and several major water sector associations since 2008 and used successfully by a number of medium and larger utilities. The *Guidebook* takes the approach embodied in Effective Utility Management and adapts it for the needs of rural and small water and wastewater systems.

What's In It for Me:

Why Should My System Use this Guidebook?

The information in the Guidebook can help rural and small systems in several important ways by:

- *Giving you a simple and objective way to evaluate your system's strengths and areas for improvement*
- *Helping you develop an easy to follow plan for improving your operations based on your assessment*
- *Helping you better communicate internally and with others like board members and customers about your system and your challenges*
- *Help build the necessary support for improving your system over time*

THE SUSTAINABLY MANAGED UTILITY: TEN KEY MANAGEMENT AREAS

The ten key management areas of sustainably managed utilities described here can help rural and small water and wastewater system managers address many ongoing challenges and move toward sustainable management of both operations and infrastructure. In aiming to increase their long-term sustainability and effectiveness, the eventual goal for systems is high achievement, consistent with the needs and expectations of their communities, in each of the management areas.

The management areas were developed by drawing on information and experience from a wide range of rural and small water system operations specialists and managers from across the United States. The management areas were further validated through the workshops held with rural and small systems, sponsored by EPA and USDA. Each management area is described as a desirable outcome for a system to achieve, and can be considered a building block for improving system performance. Through working to improve performance in each of the ten areas, managers can help their systems to become more successful, resilient, and sustainable for the long term.

- Product Quality
- Customer Satisfaction
- Employee & Leadership Development
- Operational Optimization
- Financial Viability
- Infrastructure Stability
- Operational Resiliency
- Community Sustainability & Economic Development
- Water Resource Adequacy
- Stakeholder Understanding & Support

The management areas are not presented in a specific order, but together they make up the framework for a complete and well-rounded management approach. By making improvements in any of the areas, at a pace consistent with its most pressing challenges, a system will be able to deliver increasingly efficient, higher quality services. The graphic below depicts the interconnectedness of the management areas, while also showing that no one area is weighted more heavily than another – all areas are equal in the context of the *Guidebook.*

Descriptions of the management areas are found in the following pages, including the characteristics of successful outcomes for each area.

PRODUCT QUALITY: The system is in compliance with permit requirements and other regulatory or reliability requirements. It meets its community's expectations for the potable water or treated effluent and process residuals that it produces. The system reliably meets customer, public health, and ecological needs.

CUSTOMER SATISFACTION: The system is informed about what its customers expect in terms of service, water quality, and rates. It provides reliable, responsive, and affordable services, and requests and receives timely customer feedback to maintain responsiveness to customer needs and emergencies. Customers are satisfied with the services that the system provides.

EMPLOYEE & LEADERSHIP DEVELOPMENT: The system recruits and retains a workforce that is competent, motivated, and safe-working. Opportunities exist for employee skill development and career enhancement, and training programs are in place, or are available, to retain and improve their technical and other knowledge. Job descriptions and performance expectations are clearly established (in writing), and a code of conduct is in place and accepted by all employees.

OPERATIONAL OPTIMIZATION: The system ensures ongoing, timely, cost-effective, reliable, and sustainable performance in all aspects of its operations. The key operational aspects of the system (e.g., pressure,

flow, quality) are documented and monitored. It minimizes resource use, loss, and impacts from day-to-day operations. It has assessed its current energy use and water loss and performed related audits.

FINANCIAL VIABILITY: The system establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. The rates that it charges are adequate to pay its bills, put some funds away for both future capital expenditures and unanticipated issues, and maintain, repair, and replace its equipment and infrastructure as needed. The system discusses rate requirements with its customers, decision making authorities, and other key stakeholders.

INFRASTRUCTURE STABILITY: The system understands the condition and costs associated with its critical infrastructure assets. It has inventoried its system components, conditions, and costs, and has a plan in place to repair and replace these components. It maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable level of risk.

OPERATIONAL RESILIENCY: The system ensures that its leadership and staff members work together to anticipate and avoid problems. It proactively identifies legal, financial, non-compliance, environmental, safety, security, and natural threats to the system. It has conducted a vulnerability assessment for safety, natural disasters, and other environmental threats, and has prepared an emergency response plan for these hazards.

COMMUNITY SUSTAINABILITY & ECONOMIC DEVELOPMENT: The system is active in its community and is aware of the impacts that its decisions have on current and long-term future community health and welfare. It seeks to support overall watershed, source water protection, and community economic goals, where feasible. It is aware of, and participates in, local community and economic development plans.

WATER RESOURCE ADEQUACY: The systems ensure that water availability is consistent with current and future customer needs. It understands its role in water availability, and manages its operations to provide for long-term aquifer and surface water sustainability and replenishment. It has performed a long-term water supply and demand analysis, and is able to meet the water and sanitation needs of its customers now and for the reasonable future.

STAKEHOLDER UNDERSTANDING & SUPPORT: The system actively seeks understanding and support from decision making bodies, community members, and regulatory bodies related to service levels, operating budgets, capital improvement programs, and risk management decisions. It takes appropriate steps with these stakeholders to build support for its performance goals, resources, and the value of the services that it provides, performing active outreach and education to understand concerns and promote the value of clean, safe water and the services the utility provides, consistent with available resources.

SYSTEM IMPROVEMENT PRIORITIES: SELF ASSESSMENT

A useful first step in identifying where a system should start making improvements in the ten management areas is completing a candid and comprehensive self assessment. The self assessment included in this guide is designed to help rural and small systems identify their strengths and challenges to prioritize where efforts and resources should be focused. It can be completed by a number of different individuals within a utility (e.g., managers, staff), or as a team exercise amongst management, staff, and external stakeholders such as board members or customers (if appropriate). If used as a team exercise, it is recommended that each participant complete the assessment on his/her own, followed by a group discussion about the similarities and differences in results. Regardless of how the utility uses the assessment, the goal for all systems should be high achievement, consistent with the needs and expectations of their communities, in each of the management areas.

The self assessment has three main steps:

1) Rate achievement for each management area;
2) Rank the importance of each management area; and
3) Plot results to identify critical areas for improvement.

Once completed, the self-assessment exercise can help the systems to develop a plan for improving its outcomes in the management areas.

The Self Assessment Worksheet

STEP 1 – RATING ACHIEVEMENT AREAS

Assess your system by rating your current level of achievement for each management area. Consider how effectively your current management efforts support each of the areas, and note that each management area has several dimensions (represented by the bullet points listed for each). Your rating should reflect the dimension with the lowest level of achievement. For example, if you felt that your achievement in one dimension of a management area was low, but your achievement in another dimension of that area was high, your overall rating for the area would be low. An example of the rating exercise can be found on the following page.

Scale from low achievement to high achievement:

- Select **Low** if your system has no workable practices in place for addressing this area – very low capacity and performance.
- Select **Medium** if your system has some workable practices in place with moderate achievement, but could improve – some capacity in place.
- Select **High** if your system has effective, standardized, and accepted practices in place. It either usually or consistently achieves goals – capacity is high and in need of very little or no further development.

YOUR TURN: Proceed to Table A in Appendix I and fill out the column labeled "Step 1" for each management area before moving to Step 2.

STEP 2 - RANKING PRIORITY AREAS

Rank the importance of each management area to your system. Base this ranking on your goals and the specific needs of your community. Your ranking may be influenced by current or expected challenges (e.g., if your community is experiencing elevated population growth rates, Water Resource Adequacy may be ranked as a high priority area to address). Again, note that each management area has multiple dimensions (represented by the bullet points listed) – your ranking should represent the highest priority of all of the points listed, and should be ranked independently of the achievement level (i.e., an area can remain, and therefore be ranked, as a high priority even if the utility is already undertaking needed improvement efforts). An example of the rating exercise can be found on the following page.

Scale from low priority to high priority, keeping in mind the following:

- Current or expected challenges
- Customer or stakeholder impact (reliability, quality, timeliness)
- Consequences of not improving (non-compliance, increased cost, lost credibility, impacts to health and safety)
- Urgency (near or long term needs)
- Community priorities

YOUR TURN: Proceed to Table A in Appendix I and fill out the column labeled "Step 2" for each management area before moving to Step 3.

TABLE A: EXAMPLE

Key Management Area	Management Area Description	Step 1: Rate Achievement (Low – High)	Step 2: Rank Priority (Low – High)
1. Water Resource Adequacy **(e.g., water quantity)**	• My system is able to meet the water or sanitation needs of its customers now and for the reasonable future. • My system or community has performed a long-term water supply and demand analysis. (Applies to drinking water systems only.) • My system understands its relationship to local water availability. (Drinking water utilities should focus on utilization rates relative to any local water stress conditions, wastewater utilities should focus on return flows.)	Low	High
2. Product Quality **(e.g., clean & safe water)**	• My system is in compliance with permit requirements and other regulatory or reliability requirements. • My system meets local community expectations for the potable water and/or treated effluent and process residuals that it produces.	Medium	High
3. Customer Satisfaction	• Customers are satisfied with the services the system provides. • My system has procedures in place to receive and respond to customer feedback in a timely fashion.	High	Medium
4. Community Sustainability & Economic Development	• My system is aware of and participating in local and regional community and economic development planning activities. • My system's goals also help to support overall watershed and source water protection, and community economic goals.	High	Low
5. Employee & Leadership Development	• Training programs are in place to retain and improve institutional knowledge. • Opportunities exist for employee skills development and career enhancement. • Job descriptions, performance expectations, and codes of conduct are established.	Low	Medium
6. Financial Viability	• The rates that my system charges are adequate to pay our bills, put some funds away for the future, and maintain, repair, and replace our equipment and infrastructure as needed. (O&M, debt servicing, and other costs are covered). • My system discusses rate requirements with our customers, board members, and other key stakeholders.	Medium	High
7. Operational Optimization **(e.g., energy/water efficiency)**	• My system has assessed its current energy usage and performed an energy audit. • My system has maximized resource use and resource loss (e.g., water loss, treatment chemical use). • My system understands, has documented, and monitors key operational aspects of the system (e.g., pressure, flow, quality).	Medium	Medium
8. Infrastructure Stability **(e.g., asset management practice)**	• My system has inventoried its current system components, condition, and cost. • My system has a plan in place for repair and replacement of system components.	Low	Medium
9. Operational Resiliency	• My system has conducted an all hazards vulnerability assessment (safety, natural disasters, environmental risks, etc.). • My utility has prepared an all hazards emergency response plan.	Medium	Low
10. Stakeholder Understanding & Support	• My system actively engages with local decision makers, community, watershed (where relevant), and regulatory representatives to build support for its goals, resources, and the value of the services it provides. • My system performs active customer and stakeholder outreach and education to understand concerns and promote the value of clean and safe water.	Low	Low

STEP 3 - PLOT RESULTS

To compare your results for each management area, you will plot each pair (rating, ranking) in Table B of Appendix I. For each management area, identify your high/medium/low rating in the green Step 1 box, and find the corresponding row in the table. Then, for the same management area, identify your high/medium/low ranking in the blue Step 2 box, and find the corresponding column in the table. The box where the row and column intersect is where you should place that management area (note abbreviations below for use in the plotting exercise). The example below shows how the plotting exercise in Step 3 should be completed. The ranking and rating for each management area should be paired and placed into the corresponding box in the grid, based on the low/medium/high determinations given in Steps 1 and 2.

WA	Water Resource Adequacy	FV	Financial Viability
PQ	Product Quality	OO	Operational Optimization
CS	Customer Satisfaction	IS	Infrastructure Stability
CE	Community Sustainability & Economic Development	OR	Operational Resiliency
ED	Employee & Leadership Development	SS	Stakeholder Understanding & Support

TABLE B: EXAMPLE

Key Management Area	Management Area Description	Step 1: Rate Achievement (Low – High)	Step 2: Rank Priority (Low – High)
1. Water Resource Adequacy (e.g., water quantity)	• My system is able to meet the water or sanitation needs of its customers now and for the reasonable future. • My utility or community has performed a long-term water supply and demand analysis. (Applies to drinking water systems only) • My system understands its relationship to local water availability. (Drinking water utilities should focus on utilization rates relative to any local water stress conditions, wastewater utilities should focus on return flows)	Low	High
2. Product Quality (e.g., clean & safe water)	• My system is in compliance with permit requirements and other regulatory or reliability requirements. • My utility meets local community expectations for the potable water and/or treated effluent and process residual that it produces.	Medium	High
3. Customer Satisfaction	• Customers are satisfied with the services my system provides. • My system has procedures in place to receive and respond to customer feedback in a timely fashion.	High	Medium

Rating (Achievement)				
	High		CS	
	Medium			PQ
	Low			WA
		Low	Medium	High
		Ranking (Priority)		

YOUR TURN: Complete the plotting exercise in Step 3 in Table B of Appendix I before moving to Step 4.

STEP 4 - ANALYZE RESULTS:

Examining the results of the plotting exercise in Step 3 can help identify management areas on which to focus improvement efforts. Generally speaking, management areas that fall into the **red box** are both **very important and need improvement,** meaning that they should be seen as a top priority for improvement. Management areas that land in the **yellow boxes** should be next on the list for improvement efforts, and those that fall into the **white boxes** are important to consider for long-term improvement efforts, but likely do not need to be prioritized for immediate action. The eventual goal for all utilities should be high achievement in each of the management areas.

QUESTIONS TO CONSIDER:

Where is my system strong?

Where is there the most room for improvement?

What should my areas of focus be?

Why are these areas priorities?

A good way to identify and prioritize the actions is to create a utility management improvement plan, which should be incorporated, as appropriate, into the utility's annual budget and coordinated with its capital improvement plans. The improvement plan should be tied directly to the analysis of the self-assessment results described above.

The results of the self assessment and an improvement plan can act as building blocks for long-range planning. Preparing a long-range plan involves taking a long-term view of each of the system's goals and establishing a clear vision and mission. Improvement goals and plans from the utility management improvement plan for each priority management area should be included in a utility's long-range plan in a logical sequence, in addition to plans for maintaining high achievement in the areas of current strong performance. Even if the utility does not have a long-range plan, it is important to develop the improvement plan based on the self-assessment. Utilities are encouraged to repeat the assessment as changes to its system operations or infrastructure are made.

Types of Plans:

System Management Improvement Plan: A plan that addresses specific areas of utility management that need improvement. This type of plan should be designed around the assessment of the management areas presented in this *Guidebook.*

Capital Improvement Plan: A mid-term plan (typically over a period of four to ten years) that identifies capital projects and equipment purchases. It provides a planning schedule and identifies options for financing each item.

Long-Range Plan: A plan that addresses future outcomes to help meet goals over a long period of time (typically over a period of twenty years or more) by evaluating an organization and the environment in which it operates.

IMPROVING OUTCOMES

To create a successful systems management improvement plan, it is important to have at least a basic understanding of the following items:

- What it means to accomplish "high achievement" in each area;
- The changes a system will need to make to reach this level;
- The challenges that may arise for each management area; and
- How to track performance and progress.

This section of the *Guidebook* is designed to help systems develop a strategy for addressing each of these components of becoming a more sustainable and resilient system.

How to Succeed in Each Management Area: High Achievement and Common Challenges

Once a system has decided to improve its performance in one or more of the key management areas, the next step is to develop and implement a plan. To create a plan, it is important to have an idea of what challenges may arise, and what practices can be adopted to address each area. Found on the following pages are overviews of challenges and effective practices for five management areas that were discussed in-depth at the small system workshops that served as background for the *Guidebook*. Also included are examples of ways in which systems can measure their performance in each management area.

QUESTIONS TO CONSIDER FOR EACH MANAGEMENT AREA:

What will constitute 'high achievement' in this area?

What factors have led to performance gaps in this area?

What changes will my utility need to make to improve performance?

Who will need to be involved for changes to take place?

How will my utility track performance progress?

What will be the biggest challenges to performance improvement?

Are there external resources that can support the improvement of performance in this management area?

EMPLOYEE & LEADERSHIP DEVELOPMENT

> **Try This:**
>
> Develop relationships with neighboring systems to share training resources.

Challenges specific to **Employee & Leadership Development** include:

- Employee motivation and opportunities for development can be hampered by a lack of resources.
- Not having access to training opportunities can prevent personal and professional development.
- Not having written job responsibilities can lead to uncertainty about management expectations and a lack of recognition for the work that is done.
- Time constraints on employees.

Examples of actions taken by high performing utilities in **Employee & Leadership Development** include:

- Have programs in place to retain and improve institutional knowledge, such as a "living document" with best practices for different areas of utility operations that is updated regularly (e.g., have a "best practices" document that includes sections for each area of operation, and every six months ask an operator from each area to review the content and make updates as necessary).
- Ensure that staff members are cross-trained (i.e., more than one staff member can do a specific job).
- Allow employees to work non-traditional schedules (e.g., a modified overtime schedule) to allow for on-the-job-training (e.g., job shadowing of other employees as a part of cross-training).
- Identify and schedule key training events that staff members are required to attend. Whenever possible, make training events short and focused, and build them into the regular work day.
- Establish and clearly communicate staff performance requirements (e.g., create a table of capabilities for successful performance in the different positions and review with staff annually).
- Create an outreach plan to attract qualified staff (e.g., with local schools or veteran's associations).
- Create incentive programs to retain staff, encourage training, or encourage staff to take on additional duties (e.g., monthly or quarterly recognition/awards for staff that have gone above and beyond their regular duties or competition between staff members for accruing the most training hours in a set period of time).
- Develop training module templates for how to conduct trainings on different topics. Include presenter notes and materials for participants.
- Check in with staff regularly to identify new training needs.
- Create partnerships with the system's insurance agency or state water organization to benefit from free or reduced rate training programs that they may offer.
- Help train, or otherwise assist, staff from neighboring utilities.

Measures that you might consider for tracking accomplishments in Employee & Leadership Development:

- **Employee turnover rate:** $\frac{\textit{Number of employee departures per year}}{\textit{Number of total positions per year}}$
- **Employee job satisfaction rate:** $\frac{\textit{Number of employees satisfied with their jobs per year}}{\textit{Total number of employees per year}}$
- **Annual training hours per employee**

FINANCIAL VIABILITY

> **Try This:**
>
> Undertake a rate study to determine if current rates are adequate to meet both current and future needs.

Challenges specific to **Financial Viability** include:

- It is uncomfortable and politically challenging to discontinue service to neighbors, acquaintances, elderly customers, or fixed income customers who have not paid their bills.
- It is difficult to communicate to elected officials and consumers about how much it costs to produce drinking water and process wastewater, making it a challenge to get rate increases approved.
- Customers feel that flat rate billing practices are unfair (low volume users paying the same as high volume users).
- Many times, board members were elected by running on the platform of no rate increases.

Examples of actions taken by high performing utilities in **Financial Viability** include:

- Discuss rate requirements and related system repair requirements with its customers, board members, and other key stakeholders so that there is a better understanding within the community of why rate decisions and changes are made. (Consider using a respected member of the community to facilitate this discussion).
- Have a study on rate requirements conducted by an independent consultant (e.g., National Rural Water Association, Rural Community Assistance Partnership) to back up discussions about rate requirements.
- Establish predictable rates, consistent with community expectations and acceptability.
- Have financial accounting policies and procedures in place.
- Have ordinances in place for automatic rate increases tied to cost of living increases.
- Set aside funds for reserves (i.e., have a "rainy day" fund).
- Increase equity in billing practices by using meters whenever possible.
- Conduct quarterly budget reviews.
- Identify priorities for system improvements to aid in allocation of available funds.
- Improve practices for reducing the number of outstanding bills (e.g., limit the carry-forward balance to a fixed amount or increase service connection fees or service deposits to discourage customers who move frequently or avoid paying their bills).
- Create incentives for early bill payment (e.g., a 5% discount for bills paid early, or a good customer discount such as a discount on the seventh month's bill after six months of paying on time).
- Communicate financial viability information to stakeholders to keep them informed about rates.

Measures that you might consider for tracking accomplishments in Financial Viability:

- **Revenue to expenditures ratio:** $\frac{Total\ annual\ revenue}{Total\ annual\ expenditures}$
- **Debt ratio:** $\frac{Total\ liabilities}{Total\ assets}$
- **Number of late or unpaid bills per billing period**
- **Number of annual shutoffs**

INFRASTRUCTURE STABILITY

Challenges related to **Infrastructure Stability** include:

- Planning for repair and maintenance of infrastructure is hampered by a limited knowledge of the condition of existing infrastructure components.
- Many systems are trapped in a reactive repair and maintenance mode leaving little or no time for undertaking the proactive work needed to establish an asset management program.

Try This:

Create an inventory of your assets over time by setting up a template for logging assets. Log assets at the time that regular maintenance is performed.

Examples of actions taken by high performing utilities in **Infrastructure Stability** include:

- Create a complete and organized inventory of its current system components, condition, location, age, life expectancy, and cost.
- Conduct inflow and infiltration (I&I) and water loss analyses to determine the revenue and cost implications of deteriorating pipe conditions.
- As major collection system replacements are needed, consider sewer (sanitary and stormwater) separation to improve treatment performance and preserve treatment capacity.
- Track the status of all system components to be better aware of where weaknesses exist and when maintenance may be required (e.g., plotting valves, hydrants, and main breaks on a map).
- Coordinate asset repair, rehabilitation, and replacement with other community projects and repairs (e.g., road maintenance) to minimize disruptions and other negative consequences. Communicate these repairs in advance with customers in case of service disruptions.
- Track the frequency and cause of repeat collection, distribution, and maintenance problems.
- Establish a capital improvement plan that identifies capital projects and equipment purchases, as well as the resources needed to fund them.
- Have an understanding of system operating parameters (e.g., pressure).
- Organize all system documentation in a manner that it can be easily accessed by multiple staff members in the case of a break-down or other event.
- Focus on small annual projects and system upgrades rather than major undertakings.

Measures that you might consider for tracking accomplishments in Infrastructure Stability:

- **Inventory completeness rate:** $\frac{\textit{Total number of critical assets inventoried}}{\textit{Total number of critical assets owned and operated}}$
- **Condition assessment rate:**

$$\frac{\textit{Number of assets with condition assessed and put into condition categories}}{\textit{Total number of assets}}$$

OPERATIONAL RESILIENCY

Challenges related to **Operational Resiliency** include:

- A lack of system documentation.
- Insufficient time to conduct training and exercises on the emergency response plan.
- Employee and board member turnover makes it difficult to maintain familiarity with emergency response procedures and materials.

> **Try This:**
>
> Use an annual board meeting as an opportunity to distribute and review key emergency documents.

Examples of actions taken by high performing utilities in **Operational Resiliency** include:

- Conduct an all hazards vulnerability assessment.
- Prepare an all hazards emergency response plan, including all associated documents (e.g., shut off checklists, notices, and contact information), and conduct training and exercises on the plan. In this plan, make sure to indicate who is responsible for each activity.
- Distribute all emergency documents to board members and other essential personnel, including local emergency responders.
- Participate in your state's Wastewater Agency Response Network (WARN) program to share resources with neighboring utilities during an emergency through mutual aid and assistance.
- Develop relationships with contractors to ensure the types of equipment and services needed during emergencies are available in a timely fashion.
- Have safety policies in place to protect employees against work-related injuries.
- Identify and establish risk communication roles and responsibilities.
- Coordinate emergency response plans with local response partners, including emergency management agencies, police, fire, and critical independent sectors (e.g., hospitals and power companies).
- Identify a state certified laboratory that can help with emergency water testing during an incident.
- Plan for recovery by identifying funding resources that may be available to restore and strengthen the resiliency of your system.
- Identify opportunities to mitigate and adapt to climate change.

Measures that you might consider for tracking accomplishments in Operational Resiliency:

- **Annual number of work-related injuries**
- **Annual number of emergency response trainings or exercises held**
- **Period of time (hours or days) that minimum daily demand can be met with the primary water source unavailable**

STAKEHOLDER UNDERSTANDING & SUPPORT

Challenges related to **Stakeholder Understanding & Support** include:

- Customers and stakeholders display a lack of interest in gaining a better understanding of utility needs.
- Customer resistance to paying water bills or supporting rate increases.

Try This:

Host an open house or annual barbeque at your facility for stakeholders and community members. Offer tours of the facility to citizens and local media as a part of this event.

Examples of actions taken by high performing utilities in **Stakeholder Understanding and Support** include:

- Perform active customer and stakeholder outreach and education (e.g., hold meetings with stakeholders at the facility to convey a basic understanding and knowledge of utility operations).
- Utilize engagement and outreach activities as opportunities to also better understand community and customer needs and interests related to utility operations.
- Promote the value of clean and safe water (e.g., utilize pre-prepared National Rural Water Association education materials associated with its Quality on Tap program).
- Actively engage with local decision makers, watershed, and regulatory representatives through newsletters, regular meetings, and surveys.
- Have a capital improvement plan or other document to share with stakeholders that summarizes utility priorities. Make this information easily available.
- Establish active level of service goals to set performance measures for the utility and share with customers.
- Use space in bills to provide important information to customers.
- Share positive information on your utility with local media sources as a way of establishing a positive working relationship.

Measures that you might consider for tracking accomplishments in Stakeholder Understanding & Support:

- **Annual number of stakeholder outreach activities conducted**
- **Amount of annual positive media coverage (number of media stories per year)**
- **Rate of responsiveness to stakeholder suggestions/complaints:**

$$\frac{\textit{Number of stakeholder suggestions or complaints responded to}}{\textit{Total number of stakholder suggestions or complaints}}$$

Developing and Implementing a System Management Improvement Plan

CREATING A PLAN

Having gained a more complete understanding of strengths and challenges based on the self-assessment and an idea of what actions can strengthen performance in the management areas, a system will be better equipped to develop an effective utility management improvement plan. It is often useful for a "champion" to be assigned to be in charge of overseeing the development of an improvement plan (or parts of the plan), but various staff members and managers should be involved in its creation, if possible. In drafting a plan, the utility should create specific tasks and tactics for addressing its targeted improvement areas, and identify management adjustments necessary to make the desired changes.

Upon completion of the self assessment exercise, the system will choose priority improvement areas based on the results, choosing areas in the red and yellow boxes of the plotting exercise first. The utility management improvement plan should be **simple, specific, realistic, and complete.** For each improvement action, the following components should be included in the plan:

- An easy-to-understand, but still thorough, **description** of what actions will be taken;
- Identification of **who will be responsible** for taking the action;
- Known **resources** already on-hand or needed to successfully complete the actions (financial, informational, or other);
- Identification of key **challenges** that will need to be addressed;
- A **timeline** with key milestones for the actions in the plan, and a date by when the plan will be completed (or acknowledgement if it is ongoing); and
- A **review loop** to periodically assess progress in implementing the plan and adapting the plan to changing conditions (e.g., implementing a new billing system, measuring the efficiency of the system as implemented, and refining the system based on the information from the performance measures).

The utility can create its own improvement plan format based on its unique needs and circumstances, or use the System Management Improvement Plan Worksheet that is provided in Appendix II.

The System Management Improvement Plan Worksheet

Instructions:

1. *List your top three priority management areas – these should be drawn from the self assessment activity.*
2. *List the improvement actions that you will undertake to address the priority management areas – you should have at least one action for each priority management area (actions may address multiple management areas).*
3. *Fill out the details in the table below for each improvement action separately (i.e., one table per action).*

EXAMPLE SYSTEM MANAGEMENT IMPROVEMENT PLAN WORKSHEET

Priority Management Areas:

1. Water Resource Adequacy
2. Product Quality
3. Financial Viability

Improvement Action:	Improve practices for reducing the number of outstanding bills
Description: ✓ Action ✓ Management Area(s) addressed ✓ Objective(s)	✓ Limit the carry-forward balance to a fixed amount and increase service deposits to discourage customers who move frequently or avoid paying their bills. ✓ Financial Viability ✓ Reduce the amount of money lost to unpaid bills
Timeline: ✓ Start date ✓ Milestones ✓ Target completion date	✓ June 2013: Start –Draft new carry-forward balance allowance and new service deposit requirements for new customers ✓ July 2013: Propose and approve new balance and deposit requirements at board meeting August 2013: Notify customers of new requirements ✓ September 2013: Completion – Implement new balance and deposit requirements
Responsible Party (or Parties):	✓ Bill Smith ✓ Jane Anderson
Relevant Resources (on-hand or needed):	✓ Example ordinance text created by other utilities to support the desired policy change
Challenges to Address:	✓ Public pressure on board members to reject rate increases
Review Process: ✓ Performance indicators or measures ✓ Status reports and updates frequency/cycle	✓ Milestone dates met ✓ Weekly progress checks with utility director relative to identified milestones
Other Notes:	✓ Conduct calls with each board member to explain the need for the policy change and answer their questions

YOUR TURN: Complete the Improvement Plan Worksheet in Appendix II.

MEASURING PROGRESS

As a part of the review loop built into an action plan, the system must determine how to track progress toward achievement of performance goals. For rural and small systems, it is most feasible to measure internal performance, rather than trying to gather external data needed for more complex evaluations. Some measurements to consider are included in the "How to Succeed in Each Area" section of the *Guidebook*, beginning on page 11, but it is important to remember that performance measures should be tailored to the specific needs and goals of each system.

Some points to keep in mind when selecting performance measures are included below:

- Select the **right number, level, and type of measures** for the utility's capabilities and capacity. (As a general rule, having a short list of measures is probably best)
- Measuring performance will require some level of **resource commitment**. (Resources can include money, time, and personnel)
- Develop **clear and consistent definitions** for each measure. (How will it be tracked and reported?)
- Set **reasonable targets** based on criteria such as performance and improvement in previous years, or customer expectations. (How quickly does the community expect projects to be completed?)
- Develop a process for **evaluating and responding to the results** of measuring progress. (Now that the utility knows how it is doing, how will it use this information to continue to improve its performance?)
- Select measures that support the system's **short-term and long-term goals**. (How do these measurements fit into the "big picture" of the utility?)
- Periodically report on progress to the board and other key stakeholders in the community.
- **Recognize and celebrate** progress along the way! (Every little bit counts)

ASSESSING ACCOMPLISHMENTS AND MAKING IMPROVEMENTS

Having created a system for measuring progress toward meeting improvement goals, a system will need to complete the third step in the review loop: assessing accomplishments (or pitfalls) and making adjustments as needed. Setting aside time on a quarterly, biannual, or annual basis to discuss the progress that has been made towards key management goals is one of the simplest, but most important, actions that a system can take. By addressing the key questions and modifying the improvement plan on a regular basis, a system will keep the goals, and itself, up-to-date on current issues and on the path to being a more resilient, sustainable system.

QUESTIONS TO CONSIDER:

What is working? Why?

What is not working? Why?

Have internal or external conditions for my utility changed?

How can my plan be adjusted accordingly?

APPENDICES

Appendix I: Self Assessment Worksheet

Appendix II: System Improvement Plan Worksheet

Appendix III: Resources for Rural and Small Systems

APPENDIX I: SELF ASSESSMENT WORKSHEET

STEP 1 – RATING ACHIEVEMENT AREAS

Assess your system by rating your current level of achievement for each management area. Consider how effectively your current management efforts support each of the areas, and note that each management area has several dimensions (represented by the bullet points listed for each). Your rating should reflect the dimension with the lowest level of achievement.

Scale from low achievement to high achievement:

- Select **Low** if your system has no workable practices in place for addressing this area – very low capacity and performance.
- Select **Medium** if your system has some workable practices in place with moderate achievement, but could improve – some capacity in place.
- Select **High** if your system has effective, standardized, and accepted practices in place. It either usually or consistently achieves goals – capacity is high and in need of very little or no further development.

STEP 2 - RANKING PRIORITY AREAS

Rank the importance of each management area to your system. Base this ranking on your goals and the specific needs of your community. Your ranking may be influenced by current or expected challenges (e.g., if your community is experiencing elevated population growth rates, Water Resource Adequacy may be ranked as a high priority area to address). Again, note that each management area has multiple dimensions (represented by the bullet points listed) – your ranking should represent the highest priority of all of the points listed, and should be ranked independently of the achievement level (i.e., an area can remain, and therefore be ranked, as a high priority even if the utility is already undertaking needed improvement efforts).

Scale from low priority to high priority, keeping in mind the following:

- Current or expected challenges
- Customer or stakeholder impact (reliability, quality, timeliness)
- Consequences of not improving (non-compliance, increased cost, lost credibility, impacts to health and safety)
- Urgency (near or long term needs)
- Community priorities

TABLE A

Key Management Area	Management Area Description	Step 1: Rate Achievement (Low – High)	Step 2: Rank Priority (Low – High)
1. Water Resource Adequacy **(e.g., water quantity)**	• My system is able to meet the water or sanitation needs of its customers now and for the reasonable future. • My utility or community has performed a long-term water supply and demand analysis. (Applies to drinking water systems only.) • My system understands its relationship to local water availability. (Drinking water utilities should focus on utilization rates relative to any local water stress conditions, wastewater utilities should focus on return flows.)		
2. Product Quality **(e.g., clean & safe water)**	• My system is in compliance with permit requirements and other regulatory or reliability requirements. • My utility meets local community expectations for the potable water and/or treated effluent and process residuals that it produces.		
3. Customer Satisfaction	• Customers are satisfied with the services the system provides. • My system has procedures in place to receive and respond to customer feedback in a timely fashion.		
4. Community Sustainability & Economic Development	• My utility is aware of and participating in local and regional community and economic development planning activities. • My utility's goals also help to support overall watershed and source water protection, and community economic goals.		
5. Employee & Leadership Development	• Training programs are in place to retain and improve institutional knowledge. • Opportunities exist for employee skills development and career enhancement. • Job descriptions, performance expectations, and codes of conduct are established.		
6. Financial Viability	• The rates that my utility charges are adequate to pay our bills, put some funds away for the future, and maintain, repair, and replace our equipment and infrastructure as needed. (O&M, debt servicing, and other costs are covered.) • My utility discusses rate requirements with our customers, board members, and other key stakeholders.		
7. Operational Optimization **(e.g., energy/water efficiency)**	• My utility has assessed its current energy usage and performed an energy audit. • My utility has maximized resource use and resource loss (e.g., water loss, treatment chemical use). • My utility understands, has documented, and monitors key operational aspects of the system (e.g., pressure, flow, quality).		
8. Infrastructure Stability **(e.g., asset management)**	• My utility has inventoried its current system components, condition, and cost. • My system has a plan in place for repair and replacement of system components.		
9. Operational Resiliency	• My utility has conducted an all hazards vulnerability assessment (safety, natural disasters, environmental risks, etc.). • My utility has prepared an all hazards emergency response plan.		
10. Stakeholder Understanding & Support	• My system actively engages with local decision makers, community, watershed (where relevant), and regulatory representatives to build support for its goals, resources, and the value of the services it provides. • My utility performs active customer and stakeholder outreach and education to understand concerns and promote the value of clean and safe water.		

STEP 3 - PLOT RESULTS

To compare your results for each management area, you will plot each pair (rating, ranking) in the grid below. For each management area, identify your high/medium/low rating in the green Step 1 box, and find the corresponding row in the table. Then, for the same management area, identify your high/medium/low ranking in the blue Step 2 box, and find the corresponding column in the table. The box where the row and column intersect is where you should place that management area (note the abbreviations below for use in the self assessment plot).

WA	Water Resource Adequacy	FV	Financial Viability
PQ	Product Quality	OO	Operational Optimization
CS	Customer Satisfaction	IS	Infrastructure Stability
CE	Community Sustainability & Economic Development	OR	Operational Resiliency
ED	Employee & Leadership Development	SS	Stakeholder Understanding & Support

TABLE B

Rating (Achievement)	**High**			
	Medium			
	Low			
		Low	**Medium**	**High**
		Ranking (Priority)		

STEP 4 - ANALYZE RESULTS

Examining the results of the plotting exercise in Step 3 can help identify management areas on which to focus improvement efforts. Management areas that fall into the **red box** are both very important and under-developed, meaning that they should be seen as a top priority for improvement. Management areas that land in the **yellow boxes** should be next on the list for improvement efforts, and those that fall into the **white boxes** are important to consider for long-term improvement efforts, but likely do not need to be prioritized for immediate action. The eventual goal for all systems should be high achievement in each of the management areas.

QUESTIONS TO CONSIDER:

Where is my utility strong?

Where is there the most room for improvement?

What should my areas of focus be?

Why are these areas priorities?

APPENDIX II: SYSTEM MANAGEMENT IMPROVEMENT PLAN WORKSHEET

Instructions:

- ✓ *List your top three priority management areas – these should be drawn from the self assessment activity.*
- ✓ *List the improvement actions that you will undertake to address the priority management areas – you should have at least one action for each priority management area (actions may address multiple management areas).*
- ✓ *Fill out the details in the table below for each improvement action separately (i.e., one table per action).*

Priority Management Areas:

1.
2.
3.

Improvement Action:
Description: ✓ Action ✓ Management Area(s) addressed ✓ Objective(s)
Timeline: ✓ Start date ✓ Milestones ✓ Target completion date
Responsible Party (or Parties):
Relevant Resources (on-hand or needed):
Challenges to Address:
Review Process: ✓ Performance indicators or measures ✓ Status reports and updates frequency/cycle
Other Notes:

APPENDIX III: RESOURCES FOR RURAL AND SMALL SYSTEMS

As a companion resource to this *Guidebook*, this list of resources offers additional information and guidance specific to small systems on the ten key management areas. Resources are identified in the table by the key management areas that they address (abbreviations in the table are identified in the key below). The majority of the resources listed are available free of charge.

WA	**Water Resource Adequacy**	**FV**	**Financial Viability**
PQ	**Product Quality**	**OO**	**Operational Optimization**
CS	**Customer Satisfaction**	**IS**	**Infrastructure Stability**
CE	**Community Sustainability & Economic Development**	**OR**	**Operational Resiliency**
ED	**Employee & Leadership Development**	**SS**	**Stakeholder Understanding & Support**

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
A Drop of Knowledge The Non-operator's Guide to Drinking Water Systems http://www.rcap.org/sites/default/files/rcap-files/publications/RCAP-Non-operator%27s%20Guide%20to%20DRINKING%20WATER%20Systems.pdf *Explains in simple, everyday language the technical aspects of drinking water utilities from source to tap. Helpful as an orientation and background guide for new small utility board members and small community decision makers.*										✓
ArcGIS for Water Utilities http://solutions.arcgis.com/utilities/ *An industry specific configuration of ArcGIS designed to meet common needs of water, wastewater and stormwater utilities and is delivered as module of ArcGIS for Local Government. ArcGIS for Water Utilities is a free download that you can deploy on top of either the entire ArcGIS System or the individual components of the ArcGIS System that your organization licenses.*								✓		
ArcGIS for Water Utilities – Water Conservation Dashboard http://solutions.arcgis.com/utilities/water/help/water-conservation-dashboard/ *Allows operations managers to view the progress and results of green infrastructure verifications, watering violations, and service shutdown information. Helps managers to understand and ensure the completion of water conservation field operations.*	✓						✓			

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
ARRA Registering and Reporting Guide for Water/Wastewater Systems with Loans/Grants from the U.S. Department of Agriculture-Rural Utilities Service http://www.rcap.org/sites/default/files/rcap-files/publications/RCAP%20ARRA%20Registering%20and%20Reporting%20Guide.pdf *Walks communities that received loans of American Recovery and Reinvestment Act (ARRA) funds through USDA Rural Utilities Service (RUS) (for water and wastewater projects) through the special reporting processes that must be followed for ARRA funds.*						✓				
Arsenic and Radionuclides: Small Water System Treatment Experience http://watercenter.montana.edu/training/arads/default.htm *Consists of four 10-minute video presentations and auxiliary resource files to help small-water-system personnel understand the requirements and challenges of treating their source water for arsenic or radionuclides from the perspective of their peers who operate treatment facilities.*		✓								
Asset Management: A Handbook for Small Water Systems http://epa.gov/safewater/smallsystems/pdfs/guide_smallsystems_asset_mgmnt.pdf *Presents basic concepts of asset management and provides the tools to develop an asset management plan. It is designed for owners and operators of small community water systems (CWSs). CWSs include all systems (both publicly and privately owned) with at least 25 year-round residential customers or 15 year-round service connections.*						✓	✓	✓		
AWWA Water Audit Software http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx *Free software to compile a preliminary audit.*										
The Basics of Financial Management for Small-community Utilities http://www.rcap.org/finmgmtguide *A basic guide that is ideal for a board member of a drinking water or wastewater utility who needs to understand the financial aspects of a utility's operations.*					✓	✓				
The Big Guide for Small Systems: A Resource for Board Members http://www.rcap.org/boardguide *A comprehensive desk reference that is ideal as an orientation and background for new members on a utility's board of directors. Designed for members of the board of a drinking water and/or wastewater system in a small community. In various parts of the guide, sample documents are provided that utilities can take and adapt for use in their own situations.*			✓		✓					✓

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
Board Member Training http://msucares.com/water/waterboard/waterindex.html *Trains board members in the areas of laws and regulations, duties and responsibilities, ethics, operation and maintenance, management and finance, rate setting, and public relations and customer service.*										✓
Capital Improvement Plan (CIP) Tool for Water and Wastewater Utilities http://www.efc.sog.unc.edu/reslib/item/user-friendly-capital-improvement-plan-cip-tool-water-wastewater-utilities *CIP tool with example data and tools to create easy-to-understand predictions on: financial reserves, rate increases, and capital investment.*								✓		
Care and Conserve Sewer Line Repairs http://www.cleanwateratlanta.org/environmentaleducation/CareConserve.htm *Sample program for low income assistance.*						✓				
Check Up Program for Small Systems http://epa.gov/safewater/cupss/ *Provides a simple, comprehensive approach based on EPA's highly successful Simple Tools for Effective Performance (STEP) Guide series. Use CUPSS to help you develop: a record of your assets, a schedule of required tasks, an understanding of your financial situation, and a tailored asset management plan.*						✓	✓	✓		
Circuit Rider Program http://nrwa.org/initiatives/training-and-technical-assistance/ *Provides technical assistance for the operations of rural water systems. Rural Utilities Service through contracting, has assisted rural water systems with day-to-day operational, financial, and management problems. The assistance may be requested by officials of rural water systems or RUS. The program compliments the loan supervision responsibilities for RUS. The National Rural Water Association has entered into a contract with RUS to provide this service. National Rural Water Association - State Affiliates do the work in their states.*					✓	✓		✓	✓	
Control and Mitigation of Drinking Water Losses in Distribution Systems http://water.epa.gov/type/drink/pws/smallsystems/upload/Water_Loss_Control_508_FINALDEc.pdf *Information on establishing water loss control programs.*	✓	✓		✓			✓	✓	✓	
Drinking Water Security for Small Systems Serving 3,300 or Fewer Persons http://water.epa.gov/infrastructure/watersecurity/upload/2005_12_12_smallsystems_very_small_systems_guide.pdf *Presents basic information and steps you can take to improve security and emergency preparedness at your water system.*									✓	
EFC Financial Dashboard http://www.efc.sog.unc.edu/project/utility-financial-sustainability-and-rates-dashboards *Free, interactive rates dashboards that are designed to assist utility managers and local officials analyze water and wastewater rates against multiple characteristics.*						✓	✓	✓		

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
eLearning – Leadership & Management Courses http://www.awwa.org/conferences-education/distance-learning/elearning.aspx *AWWA's online courses on leadership and management.*					✓					
eLearning – "Water Basics for Decision Makers" http://www.awwa.org/store/productdetail.aspx?productid=6655 *Document for decision makers in water or wastewater utilities, or for those who regularly interact with professionals but don't clearly understand how water is distributed and treated.*										✓
Energy Audit Webcast http://www.rcap.org/energyauditswebinar *The Association of State Drinking Water Administrators (ASDWA) and RCAP partnered to host an energy audit webinar for state drinking water program staff. The webinar covers a "how-to" plan for conducting energy audits for small water utilities and outlined a national training effort to bring an energy audit approach to all RCAP offices including undertaking a pilot initiative involving selected small water systems.*							✓			
ENERGY STAR for Wastewater Plants and Drinking Water Systems and Portfolio Manager Tool http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager *An interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment.*							✓			
Energy Use Assessment Tool for Water and Wastewater Systems (includes User Guide, Tool and Example) http://water.epa.gov/infrastructure/sustain/energy_use.cfm *An Excel-based tool to help small and medium sized water and wastewater utilities assess their current energy usage and help identify possible ways to use energy more efficiently.*				✓			✓	✓		
Financial Management Courses http://www.newwa.org/NetCode/courseDescList.aspx *Search under course category "Management."*						✓				
Financial Planning: A Guide for Water and Wastewater Systems http://www.nmenv.state.nm.us/dwb/Documents/Public%20Info/RCAC%20Financial%20guide_final_6.pdf *Guidebook that walks a utility through the annual budgeting process, the rate setting process, and creating a 6-year financial plan.*						✓				
Formulate Great Rates: The Guide to Conducting a Rate Study for a Water System http://www.rcap.org/rateguide *A guide to developing a fair and equitable rate structure in a small drinking water or wastewater system.*		✓	✓			✓				

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
Getting in Step: A Guide for Conducting Watershed Outreach Campaigns http://water.epa.gov/type/watersheds/outreach/upload/gettinginstepedition3.pdf *Provides some of the tools needed to develop and implement an effective watershed outreach plan. For a watershed practitioner trained in the sciences, this manual will help you address public perceptions, promote management activities, and inform or motivate stakeholders.*										✓
Getting Your Project to Flow Smoothly: A Guide to Developing Water and Wastewater Infrastructure http://www.rcap.org/sites/default/files/rcap-files/publications/RCAP%20Getting%20Your%20Project%20to%20Flow%20Smoothly.PDF *A comprehensive guide on all the steps a project owner (governing body of a utility) should go through in planning, designing and constructing infrastructure.*	✓			✓		✓	✓	✓		✓
Local Safe Disposal Programs: Ex. Safe Medicine Disposal for Maine http://www.safemeddisposal.com/ *The Safe Medicine Disposal for ME program provides Maine's residents with a safe disposal option for unused and unwanted medicine. Free medicine mail-back envelopes are available at participating sites.*										✓
Mutual Aid Networks http://www.epa.gov/mutualaid or www.nationalwarn.org *Describes how small systems can participate in WARN to share resources with neighboring utilities during an emergency.*									✓	
National Rural Water Association Job Network http://nrwa-jobs.jobtarget.com/c/search_results.cfm?site_id=678 *Helps to connect the most skilled professionals in the fields of drinking water, wastewater, source water protection, utility management & engineering to potential employers.*										
National Rural Water Association Technical Training and Assistance Program http://nrwa.org/initiatives/training-and-technical-assistance/ *Click on your state for contact information to obtain services under the Technical Assistance and Training Program. National Rural Water Association provides training and on-site technical assistance to waste water systems in the contiguous 48 states, Alaska, Puerto Rico, and Hawaii. The training is provided to help reduce exposure to waste related health and safety hazards and enhance the sustainability of wastewater systems in rural and small communities.*		✓					✓			
National Rural Water Association Website www.nrwa.org *Website of the National Rural Water Association, the largest water and waste water utility membership association.*										
Only Tap Water Delivers Campaign http://www.awwa.org/resources-tools/public-affairs/communications-tools/only-tap-water-delivers.aspx										✓

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
A public outreach campaign that is available to AWWA utility members free of charge. The materials are available in a CD toolkit, and can be adapted to meet local needs.										
Pipe Repair Checklist http://www.awwa.org/Portals/0/files/resources/water%20knowledge/rc%20small%20systems/piperepairchecklist.pdf *AWWA small systems pipe repair checklist.*							✓			
Preventive Maintenance Card File for Small Public Water Systems Using Ground Water http://www.epa.gov/ogwdw/smallsystems/pdfs/booket_smallsystems_preventmaint.pdf *Schedules for maintenance tasks and checklists and logs for easily recording your findings.*							✓			
Protecting Your Community's Assets: A Guide for Small Wastewater Systems http://www.nesc.wvu.edu/subpages/WW_manage_plan.cfm *Helps utility managers, operators, and local officials improve security and plan for emergency situations affecting wastewater treatment systems.*		✓						✓	✓	
Public Communications Toolkit http://www.awwa.org/resources-tools/public-affairs/communications-tools/public-communications-toolkit.aspx *Website with and online toolkit of various resources for water professionals related to public communication.*										✓
Public Education and Outreach on Stormwater Impacts http://water.epa.gov/polwaste/npdes/swbmp/Public-Education-and-Outreach-on-Stormwater-Impacts.cfm *EPA's website for local officials and communities to conduct education and outreach about stormwater, what it is, who contributes to it, and best practices related to stormwater.*										✓
Quality On Tap! Public Relations Campaign http://nrwa.org/initiatives/quality-on-tap/ *A nationwide, grassroots public relations and awareness campaign designed especially for the drinking water industry. Quality On Tap is the first practical "hands-on" guide to better public relations for small water utilities. It contains the tools small water systems need to do the most important job of all - spreading the truth to the public of the quality of work they do and the quality water they produce.*										✓
Record Keeping Rules: A Quick Reference Guide http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsystems_records_08-25-06.pdf *A rule-by-rule summary of requirements for keeping monitoring, public notice, and other records, as well as helpful tips on record maintenance and security.*		✓					✓			
Recruiting and Training Veterans Brochure: For Careers in the Water Sector http://www.workforwater.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=2					✓					

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
147483686 *The Department of Veterans Affairs and Department of Labor administer programs to assist Veterans in their transition to civilian careers and oversee funding to pay for education and job training. The Environmental Protection Agency, American Water Works Association and Water Environment Federation are working with these agencies to promote water sector careers nationally.*										
Restructuring and Consolidation of Small Drinking Water Systems **http://www.epa.gov/safewater/smallsystems/pdfs/compendeum_smallsystems_restruct.pdf** *Contains information on restructuring and consolidation authorities for public drinking water systems. It provides an individual summary for each state by listing available statutes, regulations, or policies that encourage or require consolidation or restructuring of drinking water systems.*		✓	✓	✓		✓	✓	✓	✓	
Revolving Loan Fund Program **http://nrwa.org/initiatives/revolving-loan-fund/** *The NRWA Revolving Loan Fund was established under a grant from USDA/RUS to provide financing to eligible utilities for pre-development costs associated with proposed water and wastewater projects. RLF funds can also be used with existing water/wastewater systems and the short term costs incurred for replacement equipment, small scale extension of services or other small capital projects that are not a part of your regular operations and maintenance.*						✓				
Rural Community Assistance Partnership Website **www.rcap.org** *Aims to provide technical assistance and training services to rural communities develop and sustain critical infrastructure and promote economic opportunity.*										
Rural Water Supply and Sewer Systems: Background Information **http://nationalaglawcenter.org/wp-content/uploads/assets/crs/98-64.pdf** *CRS report for congress.*										
Saving Water and Energy in Small Water System **http://watercenter.montana.edu/training/savingwater/default.htm** *A training program that consists of four 45-minute presentations and associated resource files. The presentations are meant for use in classroom or workshop settings. The four modules address the following topics: water conservation, energy management, alternative energy, and water accounting (audit and leak detection).*	✓			✓			✓			
Security and Emergency Management System (SEMS) **http://semstechnologies.com/RAMCAP.asp** *Software to assist small water systems in completing a vulnerability self-assessment.*								✓	✓	
Security and Emergency Response Planning Toolbox for Small Water and Wastewater Systems **http://www.rcap.org/toolbox** *Consists of five core modules, appendices, and introductory text that relate security and emergency preparedness to best practices of system operation and*								✓	✓	

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
management.										
Setting Small Drinking Water Rates for a Sustainable Future http://www.epa.gov/owm/waterinfrastructure/pdfs/final_ratesetting_guide.pdf *A step-by-step rate setting guide for small utilities for assessing annual costs, revenue needs, and reserve requirements and setting appropriate rates.*						✓				✓
Small Drinking Water Systems Handbook A Guide to "Packaged" Filtration and Disinfection Technologies with Remote Monitoring and Control Tools http://nepis.epa.gov/Adobe/PDF/100046K6.pdf *Provides information to the small system operator, manager, and/or owner about different approaches to providing safe and affordable drinking water to your community.*		✓						✓		
Small System Guide to Safe Drinking Water Act Regulations http://epa.gov/safewater/smallsystems/pdfs/guide_smallsystems_sdwa.pdf *A resource for understanding current and anticipated drinking water regulations with which utilities need to comply.*		✓								
Small Utility Board Training http://watercenter.montana.edu/training/board_training/default.htm *A training course designed to help water board members and elected officials understand the basic principles of public water system regulation, operation, planning, budgeting and communication.*					✓					✓
Source Water Collaborative http://www.sourcewatercollaborative.org/ *A web forum about where America's safe drinking water begins – the lakes, streams, rivers, and aquifers we tap for public water systems. The Collaborative is a web portal of 25 national organizations that have united to protect America's sources of drinking water.*	✓	✓								
Strategic Planning: A Handbook for Small Water Systems, Simple Tools for Environmental Protection (STEP) Guide http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsystems_stratplan.pdf *Presents basic concepts on strategic planning for small water systems and explains how this process can help improve your technical, managerial, and financial capabilities. It provides background information on the process of strategic planning and a series of worksheets to use in developing a written strategic plan.*				✓		✓	✓	✓	✓	
Stakeholder Analysis http://www.sswm.info/category/planning-process-tools/exploring#Stakeholder Analysis *A portion of the Sustainable Sanitation and Water Management online Toolbox.*										✓
Survival Guide: Public Communications for Water Professionals www.wef.org/WorkArea/DownloadAsset.aspx?id=7120 *A guidebook to help utilities learn how to communicate effectively with their community and customers. It provides an overview focused on the learning the*										✓

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
basics of public communication and different public communication scenarios.										
Sustainable Infrastructure for Small System Public Services: A Planning and Resource Guide http://www.rcap.org/sites/default/files/rcap-files/publications/RCAP%20Sustainable%20Infrastructure%20Guide.PDF *Provides worksheets, examples, case studies and resources on water conservation, energy efficiency and renewable energy resources for small utilities.*				✓		✓	✓	✓	✓	
Tabletop Exercise Tool for Water Systems http://yosemite.epa.gov/ow/SReg.nsf/description/TTX_Tool *A PC-based tool that contains materials to assist those interested in planning and facilitating tabletop exercises that focus on Water Sector-related issues. The updated TTX Tool contains fifteen scenarios that address an all-hazards approach to emergency preparedness and response, including natural hazards and manmade incidents, as well as introduces users to the potential impacts of climate change.*									✓	
Taking Stock of Your Water System: A Simple Asset Inventory for Very Small Drinking Water Systems http://www.epa.gov/ogwdw/smallsystems/pdfs/final_asset_inventory_for_small_systems.pdf *Helps very small water systems, such as manufactured home communities and homeowners' associations, assess their condition by preparing a simple asset inventory.*						✓		✓		
Talking to Your Decision Makers: A Best Practices Guide http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsys_decision_makers_08-25-06.pdf *Tips for working successfully with decision makers in your community to meet your water system's needs.*										✓
Talking to Your Customers About Chronic Contaminants in Drinking Water: A Best Practices Guide http://water.epa.gov/drink/contaminants/upload/2007_11_02_contaminants_fs_containinants_chronic_talkingtocustomers.pdf *Guidelines for effectively communicating with customers about the dangers of chronic contaminants and how water systems protect against contamination.*			✓	✓						✓
Technitrain Program http://www.rcap.org/technitrain *Helps to protect public health and foster economic development in targeted rural communities throughout the United States and its territories by providing onsite, community-specific technical assistance and training that: identifies and evaluates solutions to water and waste disposal problems, assists communities in preparing funding applications for their water and waste projects, and improves operation and maintenance of existing water and waste-disposal facilities. It is part of RCAP's overall mission of working with small, rural communities to increase local capacity.*				✓	✓	✓				

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USDA Rural Utilities Service Borrower's Guide: A How-to for Water and Wastewater Loans from USDA Rural Development http://www.rcap.org/pubs/usdaborrguide *Summarizes the managerial and financial requirements for communities that are receiving U.S. Department of Agriculture Rural Utilities Services (RUS) loan funds for their water or wastewater utility.*						✓				
Vulnerability Self-Assessment Tool (VSAT) http://water.epa.gov/infrastructure/watersecurity/techtools/vsat.cfm *A risk assessment software tool that assists drinking water and wastewater utilities in assessing security threats and natural hazards and updating utility Emergency Response Plans; appropriate for any water system size or type.*								✓	✓	
Water and Environment Programs - Engineering Success Stories http://www.usda.gov/rus/water/ees/englib/success.htm *The information in these stories is provided by Rural Development, Water and Environmental Programs as a service to all those persons looking for alternative, innovative, or just plain successful approaches to rural water and waste problems.*							✓			
Water System Operator Roles and Responsibilities: A Best Practices Guide http://water.epa.gov/type/drink/pws/smallsystems/upload/2008_07_01_smallsystems_guide_smallsystems_operator_08-25-06.pdf *Helps to understand: (1) Roles and responsibilities in delivering safe drinking water to system's customers; (2) Additional responsibilities, which can vary depending on size, characteristics, managerial structure, and regulatory requirements.*		✓			✓				✓	
WaterPro Conference Website http://www.waterproconference.org/ *WaterPro is the annual conference of the National Rural Water Association. It takes place in even numbered calendar years. WaterPro is designed to bring together water and wastewater utility systems - large and small, municipal and rural - for sessions in operations, management, boardsmanship and governance.*										
WaterSense http://www.epa.gov/WaterSense/ *EPA's program to promote water efficiency and conservation. Provides information for consumers to identify products and practices that save water. Utilities and local governments can partner with EPA to receive access to a network of partners working on water conservation and promoting the value of water and using it wisely.*			✓							✓
Water System Owner Roles and Responsibilities: A Best Practices Guide http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsystems_owner_08-25-06.pdf *A summary of system owners' key duties in protecting public health, overseeing system operation, and working with local officials.*					✓					✓
Water Quality in Small Community Distribution Systems http://nepis.epa.gov/Exe/ZyPDF.cgi/P1000OY3.PDF?Dockey=P1000OY3.PDF *Assists the operators and managers of small- and medium-sized public water*		✓						✓	✓	

	WA	PQ	CS	CE	ED	FV	OO	IS	OR	SS
systems. Provides a comprehensive picture of the impact of the water distribution system network on distributed water quality.										
Water University **http://www.wateruniversity.org/** *The intent of Water University and the National Rural Water Association is to provide the highest level of instruction, education, training and discussion to the largest audience possible. To meet that goal, most of the webinar/lecture portions of these courses are presented at low or no cost. In addition to providing information to the entire water industry, Water University provides a method for licensed water professionals to earn their necessary Continuing Education Units through our advanced on-line educated modules. Access to these modules requires enrollment fees, but these fees are still very affordable compared to in-person training.*										
Water & Wastewater Pricing **http://water.epa.gov/infrastructure/sustain/Water-and-Wastewater-Pricing-Introduction.cfm** *EPA Website on water and wastewater pricing, explaining the concept of pricing and water conservation, as well as supplying tools, guides, and reports on pricing.*						✓				
Work for Water Website **http://www.workforwater.org/** *Materials to encourage careers in the water sector, where opportunities to protect and preserve water resources are virtually unlimited and the chance to make a difference is unmatched.*					✓					

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