SELF-ASSESSMENT MANUAL

FOR

IOWA WATER SYSTEM VIABILITY

RURAL WATER ASSOCIATIONS AND MUNICIPALITES

PWSID: _____

NAME OF SYSTEM: _____

NAME OF PREPARER: _____

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I. INTRODUCTION

A. THE NEED TO "OPERATE LIKE A BUSINESS"

A water system should be "operated like a business." This is a frequently repeated phrase. But, what is meant by it? Here's one useful way to think about what it means to operate like a business:

> *For a successful business, a manager must be aware of changes taking place in the environment in which the business operates. It is necessary to constantly look to the future to:*
> 1. *Cope with any threats to the survival of the business, and*
> 2. *Take advantage of opportunities to improve the performance of the business.*

In the same way, owners and managers of a water system must look to the future. Such things as the need for financing, the impact of new regulations or the loss of key customers will present management demands that can only be met through sound business planning.

Many water systems were started at a time when the cost of providing water was low and regulatory demands were few. But times have changed! Little remains of the good old days when operating a water utility was a simple job.

This manual has been created to prepare water system owners and operators for an uncertain future by becoming capable business managers and financial planners.

B. BUSINESS PLANNING: GETTING TO YOUR "BOTTOM LINE"

A successful manager relies on a "business plan" to assure a company will be able to meet the changing demands of an uncertain future.

> *A business plan requires a two-sided analysis:*
> 1. *Receiving income from sales to pay for capital investments and operating expenditures, and*
> 2. *Spending money to produce a product or service*

In any business plan, the fundamental budget question is the "bottom line" - whether income received will equal or exceed the money spent. When there is more income than expense, there is a "positive bottom line," indicating the business has done a good job of planning for challenges, and that the business will be "viable" into the future.

A "negative bottom line" indicates a business has failed to respond to threats and opportunities. Such a business may be said to be "nonviable" because its ability to survive is suspect under current conditions. In such circumstances, businesses are often "restructured" to change their costs, their access to capital, or the revenues they receive for products or services, in an attempt to become viable again.

Whether a business is viable or nonviable is directly related to the planning done by company managers. With good information, the picture is black and white. When there is little information on which to build a plan, this picture is only in shades of gray.

Unfortunately, the picture for most small water systems is gray. A lack of information about current operations and absence of planning severely limits the ability of many small systems to meet future challenges. They may not be operated as viable businesses and their survival may be uncertain.

It is out of concern for the "gray area" in which many small systems operate that the federal government has directed state agencies to implement "capacity development" programs. These programs require that water systems demonstrate the ability to meet future challenges. Chapter 455B.174 of the Iowa Code allows the Director of the Iowa Department of Natural Resources (DNR) to develop such a capacity development process for use by Iowa's public water supplies.

As a result, DNR has developed this self-guided manual for evaluating a system's capabilities and its financial health. With this guide, a manager can create a simple business plan for use in responding to threats and opportunities – a plan that will move the system out of its gray area and into the position of a viable business.

The Goal of Business Planning for Water Systems

By understanding how your water system functions, what must be done in the future to remain in compliance with government regulations, and the financial commitments that must be made, you will be able to position your utility to stay in business. Without sound business planning, it will be difficult, if not impossible, for any small water system to survive in an increasingly complex world. In completing this self-assessment manual, you will take a big step toward tomorrow, for your water system and those who depend upon it.

C. SELF-ASSESSMENT: HOW TO USE THIS BOOK

ASSESSING CAPITAL AND OPERATING COSTS

This self-assessment manual presents a structured series of yes/no questions that follow the three major elements of a complete business plan: 1. A facilities plan (Section II), 2. A management plan (Section III), and 3. A financial plan (Section IV). The questions are intended to guide you in identifying major capital and operating costs that could arise in the future operation of your system -- things that will impact your "bottom line."

> *Within each section of the manual, the questions are grouped according to overall topic areas. Each topic represents an important area where there may be hidden costs in your future. The individual yes/no questions under each topic are intended to stimulate your thinking about the topic in general. In going through them, you should keep the general topic in mind and ask yourself: "Is there anything that could surprise us and cost a lot of money?"*

There are questions covering several major areas impacting your capital and operating costs. The questions are structured such that a "yes" answer means that cost surprises are unlikely and a "no" answer means that cost surprises may occur.

When answering the questions, be honest, and if you don't know an answer, take the time to do some research. You may need to look at other records or find someone to help you understand the topic. Leave these questions blank and complete them later when you have more information.

Some questions may not apply to your system. For example, groundwater under the influence of a surface water questions do not apply to groundwater not under the influence of surface water systems. When you encounter such questions, simply cross them out and mark "NA" in the margin next to them, so you will remember to ignore those sections.

HOW DO YOU USE THE RESULTS OF THIS SELF-ASSESSMENT MANUAL?

There is no standard scoring system that can be used to interpret your answer. If you have relatively few "no" answers, the potential for unexpected threats to your continued operation is probably low.

However, it is important for you to think carefully about each "no." Consider what can be done to reduce your liability in each instance and make an estimate about what each "no" might cost you. Ask yourself: "What do all the "no" answers add up to?" "What must be done to change a "no" answer to a "yes"? "Can my system afford it?"

ASSESSING REVENUE REQUIREMENTS AND REVENUE SOURCES

Once you have completed the self-assessment of potential cost concerns, the next step is to examine the other side of the ledger in terms of income you need and the impact on customer rates. The Appendix provides a series of budgeting worksheets that can assist you in using estimates of future costs to develop a good projection of revenue requirements and customer rates.

The planning exercise in the Appendix is designed as a "what-if" budgeting exercise. It will give a glimpse of the future in black and white. Once you begin to examine your system's income requirements in this business-like manner,

management choices will become more obvious and agreement among decision makers about expenditures and rate structures will be easier to achieve.

II. ASSESSING YOUR FACILITIES

A. SUPPLY SOURCES AND FACILITIES

AVAILABILITY AND ADEQUACY OF SUPPLY SOURCES

For many water systems, obtaining a reliable quantity of water is a challenge. In some systems, it is the primary concern. Even if the quantity of water has never been a problem, it is worthwhile to "consider the source" in the future. The frequency of "yes" answers to the following questions shows how well you have considered future source availability. For questions where your answer is "no," it should become more clear what steps you might take to better assess issues involved.

Can existing sources of supply meet existing demands?

☐ Yes ☐ No Do you know how much water you pump on an average day? If yes, _____ gpd*

☐ Yes ☐ No Do you know how much water you pump on a peak day? If yes, _____ gpd*

☐ Yes ☐ No Do you know your source capacity in gpd? If yes, _____ gpd*

☐ Yes ☐ No Is your source capacity higher than your peak day demand by an adequate margin?

☐ Yes ☐ No Can you meet peak demand without pumping at peak capacity for extended periods?

☐ Yes ☐ No Have you been able to provide adequate volumes of water during recent droughts?

☐ Yes ☐ No Do you have an Emergency Conservation Plan that will allow you to meet system demand during a drought or shortage, such as the loss of your largest well or source water pump?

*gpd = gallons per day

Do you know how your demand is changing?

☐ Yes ☐ No Do you know whether your system demand will be growing, declining, or remaining stable over the next ten years?

☐ Yes ☐ No If you have large commercial, industrial, or irrigation users, do you know their long-term plans and understand their needs?

☐ Yes ☐ No Will you be capable of meeting your system demands in the future?

If you purchase water, do you fully understand the purchasing arrangement? ***(If you do not purchase water, skip this section.)***

☐ Yes ☐ No If you purchase water from another system or a wholesaler, do you know their long-term plans?

☐ Yes ☐ No Do you have a contract to purchase water?

☐ Yes ☐ No Do you know the terms affecting your supply during drought conditions?

☐ Yes ☐ No Are you guaranteed water under all conditions, even during a drought (as part of the terms)?

Are you aware of competing uses of water that draw from the same water source as you do that may impact the availability of water?

☐ Yes ☐ No Are you knowledgeable about other demands being placed on the same water source that you are using?

☐ Yes ☐ No Do you know who the other users are and do you understand their future plans?

☐ Yes ☐ No Do you fully understand your legal rights to the water?

Is your current source the best choice for the long-term?

☐ Yes ☐ No Are alternative water sources (including regionalization) possibly available to you?

☐ Yes ☐ No Are you knowledgeable of the characteristics and costs of using alternative sources?

VULNERABILITY OF SUPPLY SOURCES TO CONTAMINATION

It is better to protect water supply sources from being contaminated in the first place than to try to clean them up afterward with expensive treatment technologies. Water suppliers need to know about the potential sources of contamination may influence their water. Then you need to assess whether your source water is vulnerable to contamination.

Do you know where your water comes from?

☐ Yes ☐ No Do you know the boundaries of your watershed or the recharge area of your well?
☐ Yes ☐ No Do you know the depth of your well?
☐ Yes ☐ No Do you know the geological name of the aquifer system from which your water is drawn?
☐ Yes ☐ No Have you received your source water assessment results from the State or a contractor?
☐ Yes ☐ No Is your local community interested in participating in source water planning?
☐ Yes ☐ No Do you have a source water protection plan in place?

What potential sources of contamination exist in your watershed area or recharge area?

☐ Yes ☐ No Is your watershed area or recharge area free of discharges from human wastewater treatment facilities or agricultural feedlot waste treatment facilities?
☐ Yes ☐ No Is your watershed area or recharge area free of any facilities engaged in the production, storage, or handling of agricultural chemicals such as manufacturing plants, warehouses, or farm supply stores?
☐ Yes ☐ No Is your watershed area or recharge area free of any golf courses, corporate or institutional campuses, or intensively landscaped residential developments?
☐ Yes ☐ No Is your watershed area or recharge area free of any industrial or commercial establishments engaged in significant uses of organic (e.g. solvents) and inorganic (mining, metallurgy, chemical production, etc.) chemicals as part of production processes?
☐ Yes ☐ No Do you know what crops are grown within your watershed area or recharge area?
☐ Yes ☐ No Do you know what agricultural chemicals are in most prevalent use for these crops?
☐ Yes ☐ No Do you know what the seasonal patterns of agricultural chemical application are for these crops?
☐ Yes ☐ No Have you asked the county agricultural extension agent about cultivating practices in your area?

B. TREATMENT

TREATMENT: MICROBIOLOGICAL CONTAMINATION

Protecting water supplies from microbiological contamination is a critical utility function. This requires vigilant efforts in source protection, treatment, storage, and distribution. The key is “the multiple barriers approach.” First, the water supply needs to be protected from contact with contamination. Second, providing several levels of monitoring and treatment, as well as back-up treatment, will assure control of disease-causing micro-organisms. New regulations of the Safe Drinking Water Act (SDWA) will increase the treatment requirements for protection from microbial contamination in both surface and groundwaters.

Your treatment may have to change even if you have never had problems with microbiological contamination. Considerations are different for surface and groundwaters. There are also new considerations for maintaining treated water quality in the distribution system. “No” answers to the following questions may imply the potential for increased treatment costs.

Surface Water Systems and Systems Using Groundwater Under the Influence of Surface Water. (If this section does not apply to your facility, skip it and go to the next section. If you are unsure about whether your system is under the influence of surface water, please contact your local Field Office.)

☐ Yes ☐ No Do you provide filtration of your water?
☐ Yes ☐ No Does the type filtration provided meet the requirements of the Surface Water Treatment Rule and the Interim Enhanced Surface Water Treatment Rule?
☐ Yes ☐ No Is your filter plant well maintained; free from spalling concrete and peeling paint?
☐ Yes ☐ No Are repair parts available?

☐ Yes ☐ No Do you have back-up plans for all units that have an impact on health?
☐ Yes ☐ No Can your plant achieve a filtered water turbidity of 0.1 NTU, at least 95% of the time?
☐ Yes ☐ No Is your filtered water turbidity always less than 1.0 NTU?
☐ Yes ☐ No Do you have the capability to add coagulant before the filter?
☐ Yes ☐ No Do you have the capability to individually monitor each filter for turbidity?
☐ Yes ☐ No Do you always follow the manufacturer's instructions for calibrating your turbidimeters?
☐ Yes ☐ No Can your plant meet the current "CT" requirements with a comfortable margin?
☐ Yes ☐ No Has the state performed a "sanitary survey" or "performance evaluation" of your plant recently with satisfactory results?

Groundwater Systems. **(If your facility is a surface water system or groundwater under the influence of surface water, skip this section. If you are unsure about whether your system is under the influence of surface water, please contact your local Field Office)**

Are you sure it's groundwater?

☐ Yes ☐ No Are you sure your water supply is really "groundwater" and not "groundwater under the influence of surface water?"
☐ Yes ☐ No Does your well meet the definition of a deep well as it is defined in Chapter 40 of the Iowa Administrative Code? ("Deep well" means a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.)
☐ Yes ☐ No Is your well located outside the zone of influence of nearby streams or rivers?
☐ Yes ☐ No Is your water free from variations in turbidity and temperature in the period after storm events?

If you do not presently disinfect, will you be able to stay that way? (If you currently disinfect, skip this section.)

☐ Yes ☐ No Was your well site approved by DNR?
☐ Yes ☐ No Was your well constructed under a permit issued by DNR, or does the construction conform to current standards for siting and constructing a well?
☐ Yes ☐ No Is your well shaft encased and is the casing intact?
☐ Yes ☐ No If your wellhead is capped with a pitless adapter instead of a pitless unit, is the pitless adapter good enough to prevent contamination from surface water?
☐ Yes ☐ No Has the state performed a "sanitary survey" of your system recently with satisfactory results?
☐ Yes ☐ No Can your wells accommodate disinfection without major reconstruction?

Is your current groundwater disinfection practice providing adequate treatment? ***(If you do not disinfect, skip this section)***

☐ Yes ☐ No Do you regularly inspect and maintain your chlorine dosing equipment?
☐ Yes ☐ No Do you have back-up equipment?
☐ Yes ☐ No Do you have adequate contact time following disinfection and before the first user in the distribution system?
☐ Yes ☐ No Can you detect a chlorine residual at taps throughout the distribution system?

Distribution Systems

Are you free from the risk of having hidden problems arise during distribution?

☐ Yes ☐ No Is your system free of compliance problems with the Coliform Rule?
☐ Yes ☐ No Is your system free of complaints regarding the taste and odor of chlorine?
☐ Yes ☐ No There is now an upper limit on the chlorine concentration in finished water, set at 4.0 mg/L. Are your residuals comfortably below this level?
☐ Yes ☐ No Can you maintain adequate pressure in the distribution system under all conditions of flow?

TREATMENT: DISINFECTION BY-PRODUCTS

The public health benefits of disinfection are beyond question. However, there have recently been questions raised about the potential health effects of various chemical by-products formed by disinfectants such as chlorine. As a result, new SDWA regulations will cause small water systems to begin controlling for by-products of disinfection such as "trihalomethanes" in the early part of the next century.

Are you meeting the requirements of the Microbial/Disinfection By-Products (M/DBP) Rule?

☐ Yes ☐ No Are you using chlorine as a disinfectant? If not, what type of disinfectant are you using?

☐ Yes ☐ No Are your trihalomethane levels comfortably below 0.080 mg/L when averaged over the annual cycle?

☐ Yes ☐ No Are haloacetic acid levels comfortably below 0.060 mg/L when averaged over the annual cycle?

☐ Yes ☐ No If you treat surface water, are you planning to change the point of disinfection in the future? (If so, you must recalculate "CT" compliance after changes have been made.)

☐ Yes ☐ No If you treat surface water, are you already practicing or could you adopt "enhanced coagulation" in your current plant?

☐ Yes ☐ No If you treat surface water, could you still meet current "CT" requirements if disinfection were not allowed before filtration?

Answer these questions only if you are a surface water system or a groundwater system under the influence of surface water and you use conventional filtration (clarification and lime softening).

☐ Yes ☐ No Have you monitored your water for Total Organic Carbon (TOC)?

☐ Yes ☐ No Are your TOC levels comfortably below 8.0 mg/L?

TREATMENT: CORROSION CONTROL

Lead and copper occur in trace amounts in tap water sometimes as by-products of corrosion from pipe materials and plumbing fixtures. The allowable concentrations of these metals are governed by "The Lead and Copper Rule." There is going to be a continuing need for careful fine-tuning and adjustment of corrosion control treatment, consisting of pH and alkalinity adjustment and/or addition of chemical additives that act as corrosion inhibitors. While this does not require great capital expenditures, it requires operator diligence and entails chemical costs.

Are you likely to have to change treatment to control for corrosion by-products?

☐ Yes ☐ No Have your first draw monitoring results been comfortably below 0.015 mg/L for lead and 1.3 mg/L for copper?

☐ Yes ☐ No Is your treated water considered to be non-corrosive?

☐ Yes ☐ No Can your system accommodate corrosion control treatment without major reconstruction?

TREATMENT: RADIONUCLIDES

Naturally occurring radiological materials are present in surface and groundwaters as a result of gradual weathering of geologic materials. SDWA regulations governing contamination with radionuclides are still being actively debated and it may be a while before they are settled. It may be worthwhile to assess the potential susceptibility of your water source to this type of contamination in order to get an advance notice of possible compliance problems.

Radon gas is present sporadically in groundwaters throughout the United States. It is not present in surface waters because they are naturally aerated. There can be variability in the levels detected between directly adjacent wells, and within the same well under different pumping and drawdown conditions. Therefore, the only means of knowing for certain whether radon is present is to monitor your water supply.

Are you likely to have to change treatment to control for Radon?

☐ Yes ☐ No Have you monitored your water for radon?

☐ Yes ☐ No If yes, are your radon levels comfortably below 1000 pCi/L?

If there is no radon detected in your well, it is likely you have no compliance problems. If there is substantially more than 1000 picocuries per liter of radon in your well, aeration or other treatment may lie in your future. If there is radon

present at levels below 1000 picocuries per liter, the need for treatment will remain unknown until standards are set.

Are you likely to have to change treatment to control for Radium?

☐ Yes ☐ No Are levels of radium (226 and 228 combined) in your water comfortably below 5 pCi/L?

☐ Yes ☐ No Is the level of radium 228 in your water comfortably below 3 pCi/L?

☐ Yes ☐ No Are levels of gross alpha (including radium 226, excluding radon and uranium) comfortably below 15 pCi/L?

If you are above these levels, you may need to install treatment equipment to remove radium. Treatment may consist of lime softening, ion exchange, or reverse osmosis.

TREATMENT: INORGANIC CONTAMINANTS

Are you likely to have to change treatment to control for arsenic?

Arsenic has very active and complex chemistry. As a result, it exists in a variety of chemical forms and is widely distributed in the environment at trace levels. It is associated with a variety of health effects. Treatment choices include coagulation/filtration, lime softening, and ion exchange.

☐ Yes ☐ No Are your levels of arsenic comfortably below 0.010 mg/L? If not, you may have to treat for arsenic in the future.

Are you likely to have to change treatment to control for fluoride?

Fluoride is naturally occurring, although it is also added to provide dental benefits. However, excessive fluoride can be harmful.

☐ Yes ☐ No Are your levels of fluoride comfortably below 2.0 mg/L? The fluoride MCL is 4.0 mg/L, however at 2.0 mg/L, an additional public notice is required. Levels above 4.0 mg/L would require treatment.

Are you likely to have to change treatment to control for nitrate/nitrite?

Nitrate and nitrite are naturally occurring, but elevated levels of nitrate/nitrite are a problem in agricultural areas. The health issues associated with nitrate/nitrite involve acute effects on children, causing it to warrant serious attention.

☐ Yes ☐ No Are your levels of nitrate comfortably below 10 mg/L? If not, you may have to treat for nitrates.

☐ Yes ☐ No Are your levels of nitrite comfortably below 1.0 mg/L? If not, you may have to treat for nitrites.

☐ Yes ☐ No Is your source water free from ammonia? If not, you may have to treat for nitrites.

☐ Yes ☐ No Are your levels of ammonia comfortably below 1.0 mg/L? If not, you may have to treat for nitrites.

TREATMENT: PESTICIDES AND HERBICIDES

Removal of organic chemicals used as pesticides and herbicides can involve expensive treatment using granular activated carbon (GAC). Fortunately, only a small percentage of water systems are expected to have levels of contamination that exceed the SDWA standards. However, the presence of these chemicals indicates the existence of an active pathway from a farmer's field, a golf course, or other cultivated or landscaped area to the river or aquifer from which your supply is withdrawn. “No” answers to the following questions may imply that your water system may have to treat to remove these contaminants.

Are you likely to have to change treatment to control for pesticides and herbicides?

☐ Yes ☐ No Are your compliance monitoring results well below the Maximum Contaminant Levels for regulated pesticides and herbicides?

TREATMENT: INDUSTRIAL/COMMERCIAL CHEMICALS

The organic and inorganic chemicals typically associated with news stories about hazardous waste disposal sites are covered by the Phase I, Phase II, and Phase V SDWA regulations. Most wells are not adjacent to hazardous waste sites and most will not exhibit this sort of contamination except at very low levels.

The Phase I SDWA regulations cover Volatile Organic Compounds (VOCs) used as solvents for a multitude of industrial

and commercial applications. Although as many as 20 percent of wells may have traces of VOCs present, less than 1 percent have concentrations high enough to require treatment. The typical treatment for these VOCs is aeration. VOCs are primarily a groundwater contaminant because they escape from surface waters through natural aeration. VOCs are valuable as an indicator chemical. Since they are organic solvents, they are very mobile through soils and groundwater formations. Thus, if you have wells that have tested positive for VOCs -- even if at very low levels -- it is evidence that there is a pathway from the source of the pollution to your well. Where there are VOCs, there are often other organic and inorganic contaminants as well. Whereas removal of VOCs via aeration may be relatively inexpensive, treatment to remove other organics and inorganics may require much more expensive technologies such as granular activated carbon (GAC) or ion exchange.

Are you likely to have to change treatment to control for industrial/commercial chemicals?

☐ Yes ☐ No Are your compliance monitoring results free of detections for regulated VOCs?

☐ Yes ☐ No Are your compliance monitoring results comfortably below the Maximum Contaminant Levels for regulated organic and inorganic chemicals?

C. INFRASTRUCTURE

INFRASTRUCTURE: PUMPING

Pumping is one of the most critical functions in operating small and individual water distribution systems. Some of the most common pump problems have symptoms that are easily recognizable by experienced operators and can be corrected relatively easily. Some of the problems are minor in nature and can be avoided entirely if a preventative maintenance program is established and adhered to over the long-term.

Is your pumping equipment maintained in good condition?

☐ Yes ☐ No Do you routinely troubleshoot for signs of pump or pump motor problems?

☐ Yes ☐ No Once diagnosed, are problems corrected in a timely enough manner to avoid crisis financing, costly repairs and unscheduled downtime?

☐ Yes ☐ No Do you hire a qualified pump or well contractor to perform an inspection of all pumping equipment, identify potential problems, and perform maintenance, on an annual basis?

Do you have adequate standby/emergency power equipment and preparedness?

☐ Yes ☐ No Is there sufficient standby/emergency power capacity to supply 100% of the average daily water demand of the system (excluding fire demands) long enough to last through the length of your most likely power outage situations?

☐ Yes ☐ No Are any existing standby/emergency power equipment, controls and switches tested or exercised routinely under load conditions, for at least 30 minutes at a time?

☐ Yes ☐ No Has the local electric utility been made aware of the standby/emergency power provisions made by the water system, so that they can reinforce and safeguard the electrical facilities serving the water operations?

INFRASTRUCTURE: STORAGE

Storage tanks are primarily used to meet peak water demands or provide a reserve capacity for fire protection. Elevated storage and ground-level tanks operate as integral parts of the system of pumps, pipes, and connected pressure loads. In operation, all the parts respond to pressure changes as the system follows the daily and seasonal demands. The following questions are designed to help determine if there are problems in the storage facilities that could become major capital outlays to correct.

Is there adequate storage to meet system needs?

☐ Yes ☐ No Does the system have sufficient gravity-flow distribution storage or emergency generator-supported pumping capability to assure adequate distribution storage to provide safe and adequate service for up to 24 hours without power?

☐ Yes ☐ No Is there reserve capacity in the storage tank for fire protection support?

Are security measures adequate?

☐ Yes ☐ No Are storage tank openings such as vent pipes, screened to protect against the entrance of small animals, mosquitoes, flies and other small insects?

☐ Yes ☐ No Is there an entry hatch to allow access for cleaning and painting of the interior of the tank?

☐ Yes ☐ No Is there a filler pipe or hydrant to provide for water to be trucked in?

☐ Yes ☐ No Is the filler pipe capped and locked?

☐ Yes ☐ No Are the tanks, ground reservoirs, other structures, and the immediate surrounding areas fenced in?

Are control systems adequate?

☐ Yes ☐ No Is there a high and low water level signal system to control the pumps?

☐ Yes ☐ No Is there an altitude valve, to preclude the tank from overflowing?

☐ Yes ☐ No Is there a drain valve or hydrant to allow draining of the tank?

☐ Yes ☐ No Does the drain line discharge directly onto the ground? (Discharge directly into a sewer is prohibited)

Are tanks maintained in good condition?

☐ Yes ☐ No Is the tank inspected at least every 3 years by a qualified tank contractor for evidence of corrosion or pitting and structural weakness?

☐ Yes ☐ No Is the tank contractor capable of analyzing the coatings of paint on the interior and exterior surfaces of the tank to determine if it contains lead or other hazardous materials?

☐ Yes ☐ No Is the operator aware of all code deficiencies there might be and how much it would cost to bring the tank into compliance with current standards and regulatory requirements? (If the tank was erected some time ago, the applicable safety, sanitary and operational codes may have changed)

☐ Yes ☐ No During your most recent tank inspection, was it determined that there were no major deficiencies or potential problems?

INFRASTRUCTURE: DISTRIBUTION

The increasing cost of water has had implications on the distribution functions of water utilities. The break-even point for replacing leaking mains versus tolerating some water loss has shifted. Reducing overall unaccounted-for water loss has become an important objective. The proper management of a utility's transmission and distribution system includes maintenance, system upgrade, hydrant and meter testing, and repair and replacement of mains. The distribution facilities of a water utility are a measure of its service flexibility and growth potential. The following series of questions are designed to assist in identifying potential operational and maintenance problems in the distribution and transmission systems.

Is the system being maintained in good condition?

☐ Yes ☐ No Does the operator routinely flush, test and maintain the hydrants in the system?

☐ Yes ☐ No Are the location of valves in the mains and curb stops on the service lines precisely known?

☐ Yes ☐ No Are locations, size, and type of service lines and mains detailed on records and drawings and maintained in a secure area?

☐ Yes ☐ No Are all valves exercised periodically?

☐ Yes ☐ No Is the system free of severe “water hammer” problems?

☐ Yes ☐ No Are meter pits, pressure regulating valves, altitude valves, blow-offs, and other appurtenances maintained on a regular basis?

☐ Yes ☐ No Are the valves in the distribution system located so that when repairing leaks, the amount of wasted water and the risk of back-siphonage is minimized?

☐ Yes ☐ No Is the location of all distribution valves precisely known?

☐ Yes ☐ No When valves are found to be inoperable, are they replaced in a timely manner?

☐ Yes ☐ No Are there “problem” mains/services in the distribution system?

☐ Yes ☐ No Is there a plan in place to replace “problem” mains in the distribution system?

☐ Yes ☐ No Is your system free of asbestos?

Is unaccounted-for water being addressed and minimized?

☐ Yes ☐ No Is the amount of unaccounted-for water in the water system determined each month?

☐ Yes ☐ No Is the unaccounted-for water less than 15 percent of the total water delivered to the mains?

☐ Yes ☐ No Are the operating pressures in the water system between 35 psi and 85 psi at the service connections of each customer?

☐ Yes ☐ No Do you have a routine leak detection and repair program?

☐ Yes ☐ No Are all customers metered?

☐ Yes ☐ No Are all sources of supply metered?

☐ Yes ☐ No Are the meters calibrated and tested routinely to assure their accuracy and reliability?

Are water quality aspects of distribution receiving needed attention?

☐ Yes ☐ No Is an annual inspection for cross connection performed by the system operator?

☐ Yes ☐ No Is there a program for installing and testing backflow prevention devices where potential contamination is present?

☐ Yes ☐ No Is there a program to eliminate “dead ends” in the mains, where feasible?

☐ Yes ☐ No Are system operators knowledgeable in the identification and potential dangers of cross-connections?

Are there acceptable standards governing modifications and new construction?

☐ Yes ☐ No Is there a low percentage of mains 4” diameter or less in the water system?

☐ Yes ☐ No Is there a program to gradually replace sub-standard sized mains?

☐ Yes ☐ No Are there suitable rights-of-way and easements provided to the water system for expansion, maintenance and replacement of mains and services?

☐ Yes ☐ No Is there sufficient earth cover to protect the mains from frost damage or heavy loads, if driven over?

☐ Yes ☐ No Are materials of mains designed and selected to resist corrosion, electrolysis, and deterioration?

☐ Yes ☐ No Do you meet the required fire flow rates and time duration prescribed by the Insurance Services Office for your system?

III. ASSESSING YOUR MANAGEMENT CAPABILITIES

A. OPERATION & MAINTENANCE

Historically, the major element in a small water system was the distribution system. Source development and treatment costs were trivially small -- all that was required in many cases was a well, a pump, a tank, and perhaps a chlorinator. Operational demands were also very limited. Now, the operational demands placed on small systems are rising to unprecedented levels. Some indication of whether these operational needs can be met is provided through consideration of the following series of questions. “No” answers to the following questions indicate that the water system’s future operational needs may not be fully met.

Does your operations staff have the right training and credentials?

☐ Yes ☐ No Is the person operating your treatment system certified to operate it?

☐ Yes ☐ No Is the person operating your distribution system certified to operate it?

☐ Yes ☐ No Does your operator receive training on an ongoing basis to keep abreast of current developments in the water field?

☐ Yes ☐ No If you have a contract operator by affidavit, do you know how frequently he or she visits the plant?

☐ Yes ☐ No Do you have a back-up operator?

Does your staff fully understand and meet all current monitoring requirements?

☐ Yes ☐ No Do you have a track record free of monitoring violations?

☐ Yes ☐ No Do you know where your operation permit is and how to read it?

Are you confident you understand what it will take to meet future operational demands?

☐ Yes ☐ No Can you make an appraisal of the additional operational requirements on your water system based on the categories of questions presented above? (Do you know how this forecast matches up against your current level of operational capability?)

☐ Yes ☐ No Does your water system obtain any regular or occasional technical assistance from outside sources, such as the state, your engineer, other utilities, or organizations specifically dedicated to providing technical assistance?

☐ Yes ☐ No Are you aware of all the assistance programs that are available to you, including the Drinking Water State Revolving Loan Fund?

B. MANAGEMENT & ADMINISTRATION

As the list of quantity, quality, and infrastructure needs implied by all of the above questions grows larger and larger, the extent of management systems needed to meet all these needs also grows. The following questions highlight the general types of management systems that should exist in some form. Although some of these items may sound sophisticated, they can exist in very simple forms and get the job done very effectively. As a general rule, they need be no more sophisticated than necessary to meet the needs of the system. The important issue is that the need for management systems is recognized and is being met. "No" answers to the following questions imply that your water system may have inadequate management systems.

Is it clear who is in charge of what?

☐ Yes ☐ No Is there a clear plan of organization and control among the people responsible for management and operation of the system?

☐ Yes ☐ No Are the limits of the operator's authority clearly known?

☐ Yes ☐ No Are all the specific functional areas of operations and management assigned?

☐ Yes ☐ No Does everyone involved in operations know who is responsible for each area?

☐ Yes ☐ No Is someone responsible for scheduling work?

☐ Yes ☐ No Is your system represented by an attorney?

☐ Yes ☐ No Is someone responsible for inspecting new construction to ensure adherence to plans and specifications?

Are there clear rules and standards?

☐ Yes ☐ No Do you have explicit rules and standards for system modifications?

☐ Yes ☐ No Do you have rules governing new hook-ups?

☐ Yes ☐ No Do you have a main extension policy?

☐ Yes ☐ No Do you have standard construction specifications to be followed?

☐ Yes ☐ No Do you have measures to assure cross-connection control and backflow prevention?

☐ Yes ☐ No Do you have policies or rules describing customer rights and responsibilities?

Do you have a deliberately organized regulatory compliance program?

☐ Yes ☐ No Do you fully understand monitoring requirements and have a scheduling mechanism to assure compliance?

☐ Yes ☐ No Do you have a mechanism to obtain the most recent information on regulatory requirements?

☐ Yes ☐ No Do you know how to obtain clarification or explanation of requirements?

☐ Yes ☐ No Do you maintain adequate records to document compliance?

☐ Yes ☐ No Do you know what to do in the event of a violation?

☐ Yes ☐ No Do you understand the requirements of the Consumer Confidence Rule?

☐ Yes ☐ No Do you have a mechanism for distributing information to your customers and consumers? If so, what?

Are you prepared to handle emergencies?

☐ Yes ☐ No Do you have an emergency response plan?

☐ Yes ☐ No Is there a contingency for making emergency interconnections to neighboring systems, and do you know they will work when needed?

☐ Yes ☐ No Does everyone involved in operations know what they are to do in the event of contamination from a toxic or hazardous waste spill in your source water or a main break or a tank failure?

☐ Yes ☐ No Do you have a clear chain-of-command protocol for emergency action?

☐ Yes ☐ No Is someone responsible for emergency operations, for communications with state regulators, for customer relations, for media relations?

Are your operations conducted safely?

☐ Yes ☐ No Do you have a safety program defining measures to be taken if someone gets hurt?

☐ Yes ☐ No Does everyone understand the risks and safety measures involved in handling water treatment chemicals?

☐ Yes ☐ No Do you have written operating procedures for both routine and emergency system operations?

☐ Yes ☐ No Are you fully aware of OSHA confined space regulations?

Do you have an organized approach to maintenance?

☐ Yes ☐ No Do you have a system for scheduling routine preventive maintenance?

☐ Yes ☐ No Do you have a system for assuring adequate inventory of essential spare parts and back-up equipment?

☐ Yes ☐ No Do you have relationships with contractors and equipment vendors to assure prompt priority service?

☐ Yes ☐ No Do you have records and data management systems for system operating and maintenance data, for regulatory compliance data, and for system management and administration?

Is your management capability complete?

☐ Yes ☐ No Are you getting the outside services and technical assistance you need? Do you have adequate legal counsel, insurance, engineering advice, technical/operations assistance, rate case preparation, and financial advice?

IV. ASSESSING YOUR FINANCES

The answers to all of the above questions may have alerted you to the potential for higher levels of both capital and operating costs. Any system that can show that they have anticipated all their needs and that they are prepared to charge a rate sufficient to meet the annual revenue requirement implied by those needs, is a system that can obtain capital financing and can pay its bills - it is financially viable. The following questions illustrate some features of “good” financial planning and management to serve as points of comparison for self-assessment. Although every system cannot achieve perfection, the more “yes” answers you have, the better. The Appendix provides worksheets you can use to assess projected costs, financing, and revenue requirements.

Note: The State Revolving Fund (SRF) program requires applicants to consult a Municipal Advisor (MA) for assistance evaluating their finances. Therefore, since financial advice will be provided by the MA for SRF projects, completing Section IV and Section VI (Appendix: Budgeting Worksheets) of this Assessment is **optional** for SRF projects. Please note, SRF applicants are still require to complete Section V.

Are current financial planning mechanisms adequate?

☐ Yes ☐ No Do you have an annual budget?

☐ Yes ☐ No Do you know how to appropriately set water rates?

☐ Yes ☐ No Does your budget process provide for depreciation of the existing plant or funding reserves?

☐ Yes ☐ No Do you use the budgeting process to determine your annual revenue requirement via either the cash

needs approach or the utility approach, as described in the AWWA Revenue Requirements Manual (M35)?

☐ Yes ☐ No Do you regularly review your water rates?

☐ Yes ☐ No Do you have a capital budget or capital improvement plan that projects future capital investment needs (at least five years) into the future?

☐ Yes ☐ No Do you have a process for scheduling and committing to capital projects?

☐ Yes ☐ No Does your planning process account for all the potential capital needs suggested by all of the preceding questions in this manual?

☐ Yes ☐ No Does your long-term planning incorporate analysis of different methods that might offer cost savings to customers, such as consolidation with other nearby systems or sharing operations and management expenses with other nearby systems?

☐ Yes ☐ No Have you budgeted for the expense of the Consumer Confidence Rule?

Are current financial management mechanisms adequate?

☐ Yes ☐ No Does your water system presently operate on a break-even basis?

☐ Yes ☐ No Does it generate surplus revenue?

☐ Yes ☐ No Does it operate at a loss?

☐ Yes ☐ No Does the water system keep all the water revenues? (i.e., water revenue does not support other municipal departments or unrelated activities)

☐ Yes ☐ No Do you employ standardized, Generally Accepted Accounting Principles (GAAP) and tracking systems?

☐ Yes ☐ No Do you track budget performance?

☐ Yes ☐ No Do you have procedures for billing and collection?

☐ Yes ☐ No Do you keep records to substantiate depreciation of fixed assets and accounting for reserve funds?

☐ Yes ☐ No Are financial management record keeping systems organized?

☐ Yes ☐ No Are controls exercised over expenditures?

☐ Yes ☐ No Are controls exercised to keep from exceeding your budget?

☐ Yes ☐ No Are there purchasing procedures?

☐ Yes ☐ No Are there procedures for selection of outside contractors and suppliers?

V. PUTTING IT ALL TOGETHER: WHAT'S YOUR PLANT TO MEET THE FUTURE?

After progressing through all of the questions in this self-assessment manual, you should be in a position to summarize what you have learned about your status.

- First, you should have a list of items which need more research or investigation to fully answer the question, or to reverse your answer from "no" to "yes."
- Second, you should be able to make a qualitative summary of what you have learned by taking a clean sheet of paper and filling in the most important things that come to mind -reflecting on the issues raised in this manual - under the following headings:

  Strengths
  Weaknesses
  Opportunities
  Threats

- Third, perhaps with some additional research -or with the right assistance -you may be within range of being able to begin the more quantitative form of business planning outlined in the budget and revenue planning worksheets contained in the Appendix.

Finally, customer awareness of the issues covered by the preceding questions in this manual is the true foundation of

viability. Getting customers to fully appreciate what it takes to operate and maintain a water system is important to assure support for new capital investment and higher water rates. The more customers know about the cost to run a proper water system in the future, the more open-minded they are likely to be in considering alternative strategies for providing water service, conceivably at lower cost. Nothing focuses the mind like cost estimates. Once you have performed an analysis of prospective future liabilities and costs following the questions in this manual, you will have the information needed to begin to get people to focus on the choices involved in determining your future.

The final question, after making it all the way through these questions, to ask yourself is: ***How much of all this is known and understood by the customers; and how would this change their attitudes about the future?***

For more information or assistance in using this manual, contact:

Iowa Department of Natural Resources
Water Supply Section
502 E 9th St
Des Moines IA 50319-0034

VI. APPENDIX: BUDGETING WORKSHEETS

The Appendix includes four budgeting worksheets. Each worksheet provides space for budget data from the prior year, current year, and four years into the future. If you do not have access to historical data fill in only what is known. However, it is important to be as complete as possible. Worksheet A is an expense budget, Worksheet B is a capital budget, and Worksheet C is a reserve budget. These first three worksheets (A, B, and C) lead into Worksheet D which compares total revenue sources with the total revenue requirement of the water system. Together, these four worksheets provide you with a tool by which you can project the future financial needs of the system and your availability to meet these needs -or the system's financial viability. This section is not applicable to systems required to submit a self-assessment manual as part of a Drinking Water State Revolving Fund (DWSRF) loan, as they will have their financial viability assessed through their work with a municipal advisor and the Iowa Finance Authority prior to signing a loan.

A. WORKSHEET A - EXPENSE BUDGET

Expenses

Personnel costs. Enter the cost of salaries and benefits of the water system's operators and administrative employees.

Utilities. Enter the annual utility bill of the water system. Utilities include any power supply, including gas and electric, water supply, sewage treatment, and telephone/fax bills among others.

Outside services. Enter the total cost of any services that the water system hires another company or individual to perform. These services can include, but are not limited to, the provision of insurance, external auditors and other accounting services, legal services, architects, engineers, consultants, etc.

Small equipment, materials, and parts. Enter the total annual cost of any equipment, materials, and parts that are purchased to make repairs or otherwise maintain the water system. Only enter those items which will be paid for in a single year. Other items that have a long life (ten or fifteen years at a minimum), have a high cost that must be paid for over time, and are nonrecurrent should be added to capital outlays on Worksheet B.

Purchased water. Enter the total annual cost of any water that the water system purchases from other sources and then redistributes to the customers of the water system.

Chemicals, treatment, and monitoring. Enter the total annual cost of water treatment chemicals, other costs associated with treating the water, and the cost of monitoring water quality, including the cost of all monitoring and testing equipment.

Transportation. Enter the costs that the water system incurs for transportation-related expenses. Among others, these

include the direct cost of vehicles and vehicle maintenance and repair.

Office supplies. Enter the cost of supplies that are used in administrative work. These supplies include paper, pens, etc.

Customer billing and collection. Enter the expenses that the water system incurs in sending out customer bills and collecting payments (do not include the associated costs of personnel nor outside services).

Income Taxes. Enter the amount of the water system's annual income taxes, if applicable.

Payments in lieu of taxes. Enter the value of any taxes paid on property or any payments made in lieu of taxes.

Other. Several blank lines are available to enter other expenses not included above that the water system may incur.

Depreciation Expense. Depreciation refers to the decrease in value of property, plant, and equipment over time. If it is not a practice of your water system to account for depreciation, leave the depreciation expense line blank.

If it is a practice of your water system to account for depreciation and you contribute to a replacement/depreciation fund each year and the amount that you contribute is greater than or equal to your annual depreciation expense, leave depreciation expense blank. However, if you do not have a replacement fund or contribute significantly less to your replacement fund than the value of your depreciation expense enter your depreciation expense on Worksheet A.

Total Expenses. Enter the sum of all the expenses listed above.

WORKSHEET A - EXPENSE BUDGET

		Actual Budget (Prior Year)	Annual Budget (Current Year)	Projected Budget			
				Year 1	Year 2	Year 3	Year 4
1A	**Expenses**						
2A	Personnel Costs						
3A	Utilities						
4A	Outside Services						
5A	Small Equipment, Materials, and Parts						
6A	Purchased Water						
7A	Chemicals, Treatment, and Monitoring						
8A	Transportation						
9A	Office Supplies						
10A	Customer Billing and Collection						
11A	**Income Tax**						
12A	**Property taxes or payment in lieu of taxes**						
13A							
14A							
15A							
16A							
17A							
18A							
19A	Depreciation (please see instructions)						
20A	Total Expenses (total line 2A to 19A)	0.00	0.00	0.00	0.00	0.00	0.00

B. WORKSHEET B - CAPITAL BUDGET

Capital Outlays

New Capital Facilities. Enter the sum of all costs that are associated with purchasing or constructing new facilities for the water system whose costs involve multiple-year commitments. These items may include the pumping station, distribution pipes, storage tanks, treatment plant, and other buildings and equipment.

Renewal and Replacement Facilities. Enter the sum of all costs that are associated with purchasing or constructing renewal or replacement facilities for the water system that involve multiple-year commitments.

Other. Several blank lines are available to enter capital outlays of the system that are not included in the two previous categories.

Total Capital Outlays. Enter the sum of the capital outlays listed above.

Capital Sources

Loan/Bond Proceeds. Enter the amount of money the water system obtains through borrowing, including bank loans, the issuing of bonds, etc.

Equity. Enter the amount of contributions that the water system receives in exchange for a right, claim, or interest in the water system.

Contributions/Connection Fees. Enter the sum of funds that the water system receives from construction assistance contributions or from the imposition of fees on the extension of services.

Draw from Replacement Reserve. Enter the amount of money that the water system used from its replacement reserve to finance capital projects.

Other. Several blank lines are available to enter capital sources of the system that are not included in the previous categories. Include any grant funds that are received.

Total Capital Sources. Enter the sum of the capital sources noted above.

Net Capital. Subtract total capital sources from total capital outlays. Ideally, the net capital of the water system should equal zero. The goal should be to balance the flows of capital outlays and capital sources. If the net capital figure is positive the water system has inadequate capital sources to meet its capital outlays. If net capital is negative the water system has more funds than necessary to finance capital improvements. It is important to note that in a given year net capital may vary significantly due to the timing of cash flows. For example, the year in which a large bond issue is made, to pay for a multi- year construction project, capital sources may outweigh capital outlays significantly.

Capital Financing

Principal, Interest, and Return on Equity. Enter the amount that the water system repays annually on all debt and equity incurred to finance capital projects, including both principal and interest payments.

Other. Several blank lines are available to enter other capital financing of the system that is not included in the previous category.

Total Capital Financing. Enter the sum of all capital financing of the water system listed above.

WORKSHEET B - CAPITAL BUDGET							
		Actual Budget (Prior Year)	Annual Budget (Current Year)	Projected Budget			
				Year 1	Year 2	Year 3	Year 4
1B	**Capital Outlays**						
2B	New Capital Facilities						
3B	Renewal and Replacement Facilities						
4B							
5B							
6B							
7B							
8B	*Total Capital Outlays (total lines 2B to 7B)*	0.00	0.00	0.00	0.00	0.00	0.00
9B	**Capital Sources**						
10B	Loan/Bond Proceeds						
11B	Equity						
12B	Contributions/Connection fees						
13B	Draw from Replacement Reserve						
14B	**Grant Funds**						
15B							
16B							
17B							
18B	*Total Capital Sources (total lines 10B to 17B)*	0.00	0.00	0.00	0.00	0.00	0.00
19B	**NET CAPITAL OUTLAYS (line 8B less line 18B)**						
20B	**Capital Financing**						
21B	Principal, Interest, and Return on Equity						
22B							
23B							
24B							
25B	*Total Capital Financing (total lines 21B to 24B)*	0.00	0.00	0.00	0.00	0.00	0.00

C. WORKSHEET C - RESERVES BUDGET

Reserve for _____ . Lines 1C, 5C, 9C, and 13C are available to enter the reserve accounts that the water system uses. Examples of reserve accounts include:

- Operating Cash Reserve;
- Replacement/Depreciation Reserve;
- Emergency Reserve; and
- Debt Service Reserve.

The annual installment to the reserve account should equal the desired balance of the reserve divided by the number of

years before that balance needs to be reached. The desired or target balance should be sufficient to replace depreciated equipment, address the worst emergency situation, or support the issuance of debt. The amount that is desired or targeted for future needs should be noted on lines 4C, 8C, 12C, and 16C. Also, denote the current running balance of each reserve account (on lines 3C, 7C, 11C, and 15C).

Total Annual Reserve Installments. Denote the total amount of money that the water system allocates to all reserve accounts annually.

Total Running Balance. Denote the total amount of money in all reserve accounts.

Total Target Balance. Denote the total desired or targeted balance of all reserve accounts.

WORKSHEET C - RESERVES BUDGET							
		Actual Budget (Prior Year)	**Annual Budget** (Current Year)	**Projected Budget**			
				Year 1	**Year 2**	**Year 3**	**Year 4**
1C	**Reserve for Capital Improvement**						
2C	Annual Installment						
3C	Running Balance						
4C	Target Balance						
5C	**Reserve for**						
6C	Annual Installment						
7C	Running Balance						
8C	Target Balance						
9C	**Reserve for**						
10C	Annual Installment						
11C	Running Balance						
12C	Target Balance						
13C	**Reserve for**						
14C	Annual Installment						
15C	Running Balance						
16C	Target Balance						
17C	**TOTAL ANNUAL RESERVE INSTALLMENTS (total lines 2C, 6C, 10C, 14C)**	0.00	0.00	0.00	0.00	0.00	0.00
18C	**TOTAL RUNNING BALANCE (total lines 3C, 7C, 11C, 15C)**	0.00	0.00	0.00	0.00	0.00	0.00
19C	**TOTAL TARGET BALANCE (total lines 4C, 8C, 12C, 16C)**	0.00	0.00	0.00	0.00	0.00	0.00

D. WORKSHEET D - REVENUE ANALYSIS

Revenue Requirements

Enter the value of total expenses, net capital, total capital financing, and total annual reserve installments from the previous forms as noted.

Total Revenue Requirement. Together the items mentioned above encompass the revenue requirement of the water

system. Enter the total of these items here.

Number of Connections. Enter the number of connections that the water system serves or expects to serve in future years.

Gallons Sold (000's). In thousands, enter the total number of gallons of water the water system sells or expects to sell annually.

Revenue Requirement per Number of Connections. Divide the total revenue requirement by the number of connections.

Revenue Requirement per Thousand Gallons Sold. Divide the total revenue requirement by the gallons sold in thousands.

Current Revenue[1]

Rate Revenue. Enter the total amount of revenue that the water system collects through the levying of rates on water usage.

Other. Blank lines are available to enter other sources of revenue. These sources may include, but are not limited to, the following:

- Bulk Water Rates;
- Fire Protection; and
- Fees and Charges (bad check fees, reconnect fees, meter testing fees, late payment charges.)

If the water system has more sources of revenue than available blank lines, group similar revenues together into broader categories and note these groupings for future reference.

Total Revenue. Enter the sum of all revenue collected by the water system.

Budget Surplus (Deficit). Subtract the water system's total revenue requirement from its total revenue.

Total Revenue per Number of Connections. Divide the total revenue by the number of connections.

Total Revenue per Thousand Gallons Sold. Divide the total revenue by the gallons sold in thousands.

WORKSHEET D - REVENUE ANALYSIS

		Actual Budget (Prior Year)	Annual Budget (Current Year)	Projected Budget			
				Year 1	Year 2	Year 3	Year 4
1D	**Revenue Requirements**						
2D	Total Expenses (line 20A)	0.00	0.00	0.00	0.00	0.00	0.00
3D	Net Capital Outlays (line 19B)						
4D	Total Capital Financing (line 25B)	0.00	0.00	0.00	0.00	0.00	0.00
5D	Total Annual Reserve Installments (line 17C)	0.00	0.00	0.00	0.00	0.00	0.00
6D	**TOTAL REVENUE REQUIREMENT (total lines 2D to 5D)**	0.00	0.00	0.00	0.00	0.00	0.00
7D	Number of connections						

[1] NOTE: Future revenues are difficult to predict. Enter revenue values for years 1-4 only if the water system has the capability accurately forecast these values.

		Actual Budget (Prior Year)	Annual Budget (Current Year)	Projected Budget			
				Year 1	Year 2	Year 3	Year 4
8D	Gallons Sold (000's)						
9D	*Revenue Requirements per Number of Connections (line 6D/line 7D)*						
10D	*Revenue Requirement per (000's) Gallons Sold (line 6D/8D)*						
11D	**Revenue Sources**						
12D	Rate Revenue						
13D							
14D							
15D							
16D	TOTAL REVENUE (total lines 12D to 15D)	0.00	0.00	0.00	0.00	0.00	0.00
17D	BUDGET SURPLUS (DEFICIT) (line 16D less line 6D)						
18D	*Total Revenue per Number of Connections (line 16D/line 7D)*						
19D	*Total Revenue per (000's) Gallons Sold (line 16D/line 8D)*						