




Taking Stock of Your Water System

A Simple Asset Inventory for Very Small Drinking Water Systems





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Why Take Stock of Your Water System? An Overview of this Brochure

This brochure is a guide to help very small water systems, such as manufactured home communities and homeowners' associations, assess their condition by preparing a simple asset inventory.

Knowing what components your system has and what condition they are in will help you maintain the safety, security, and reliability of the drinking water that your system provides. An asset inventory can help you in the following ways:

- Keeping a precise inventory of your water system can assist you in complying with the federal Safe Drinking Water Act and with your state's drinking water regulations by: helping you prepare accurate budgets, identifying concerns, and preparing for future needs (whether financial, growth-related, or regulatory).
- Knowing your system's strengths and weaknesses will help you head off sudden or unexpected problems with the system's operation or the quality of water it provides.
- Gaining a better overall picture of your system will enable you to spot gaps in your system's security and take steps to address them.
- Knowing the details of your system will enable you to explain its current condition and how it operates. You will be better able to answer questions from customers, local health officials, and the media.

Inside this brochure you'll find information and worksheets (both completed examples and blank) to help you prepare an asset inventory and begin to develop a written asset management plan. You should keep a copy of this brochure with other relevant asset records and refer to them when making decisions about your system. Contact your State or Tribal Drinking Water Primacy Agency for help completing the worksheets or for more information on conducting an asset inventory. Contact information appears in Appendix A.

Maintaining and Replacing Your Assets – The Basis of Asset Management

An important part of conducting an inventory is determining when to repair, rehabilitate, or replace an asset. At some point, continuing to repair the asset will no longer be cost-effective and you will need to rehabilitate or replace it. The worksheets in this brochure will help you get a better picture of the current condition of your assets, including the ones nearing the end of their useful lives. To further help you manage your assets, EPA has developed *Asset Management: A Handbook for Small Water Systems*. The Handbook can be downloaded at: <https://www.epa.gov/dwcapacity/simple-tools-effective-performance-step-guide-series>.

How to Use this Brochure

The worksheets on the following pages will enable you to get an idea of the overall state of your water system. There are worksheets for source and intake structures, treatment system, storage tanks, distribution system, valves, electrical systems, buildings, service lines, and hydrants.

Carry out the following steps to complete the worksheets:

- 1** Fill in as much information as you can about the asset's **characteristics**, including quantity, size, location, age, and the manufacturer of the components. These characteristics will vary by asset type.
- 2** Using the estimates from the table, "Typical Life Expectancies of Water System Equipment," on page 4, and taking into account the current condition of each asset, its service history, and your experience, estimate an **adjusted useful life** for each of your assets. Subtract the **age** of your asset from its **adjusted useful life** to calculate a **remaining useful life**. **Adjusted useful lives** are the typical life expectancies of water system assets adjusted based on the characteristics of your system (e.g., poor source water quality, extreme weather conditions, operation and maintenance routines). **Adjusted useful lives** can be the same as or lower than typical life expectancies.
- 3** Identify the **contact information** of the person or company you would call to service each component and include a telephone number. If you do not know who to call, you can ask your State or Tribal Drinking Water Primacy Agency, parts manufacturers and distributors, or other water systems.
- 4** Once you've completed the asset inventory worksheets, use them to develop a basic asset management plan. Completing the asset management plan worksheets (beginning on page 28) will help you prioritize the components that will need to be replaced or rehabilitated, plan for the timing of replacement or rehabilitation, and help you determine how much money you'll need to set aside each year if you plan to pay for replacements and rehabilitations through cash reserves.

Each worksheet is preceded by a completed example that illustrates how to fill out the worksheet. Refer to the example if you have any questions about the sort of information you should include.

How *Taking Stock of Your Water System* Can Improve Your System's Capacity

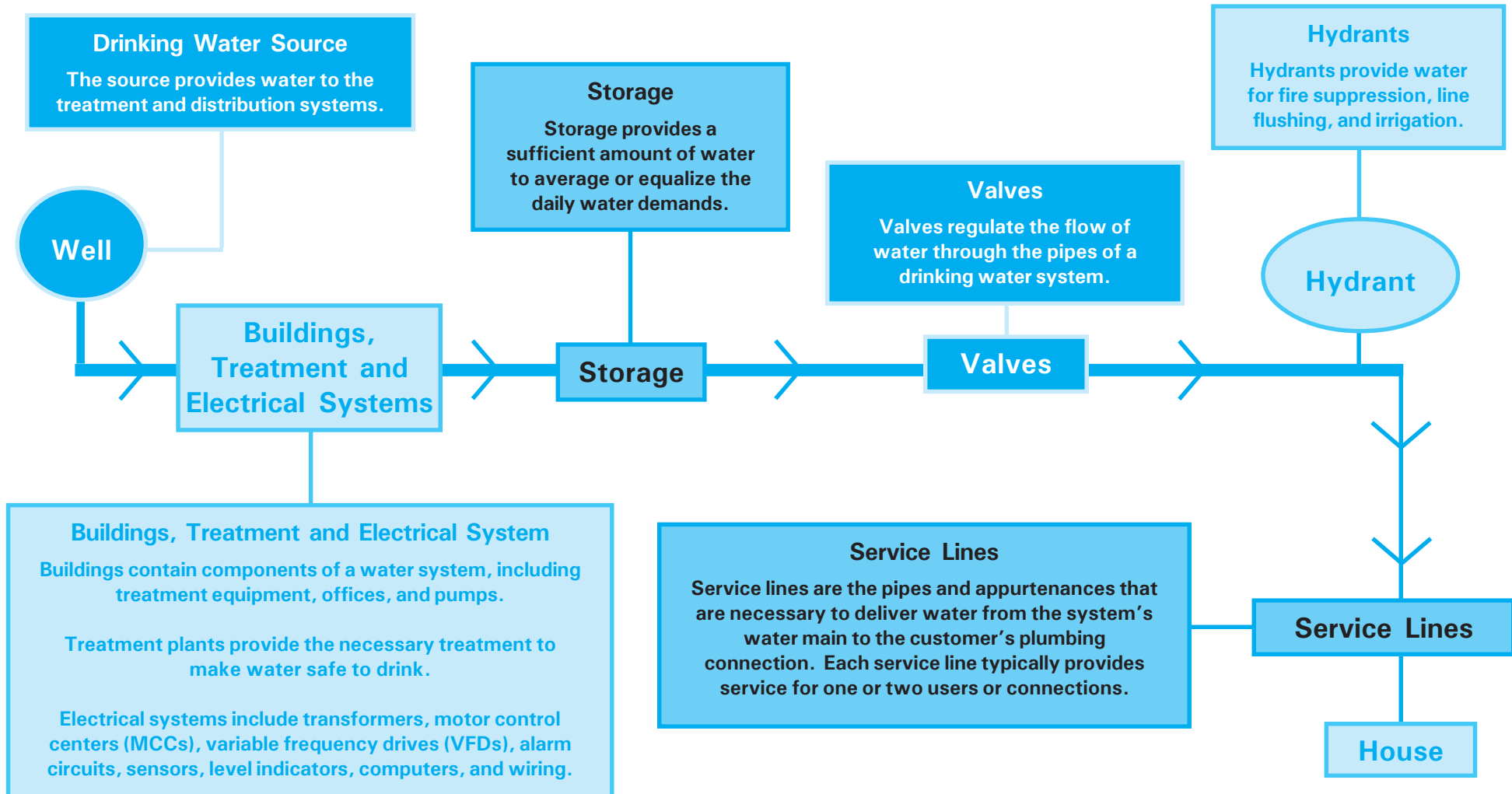
"Water system capacity" describes a system's ability to plan for, achieve, and maintain compliance with national and local drinking water standards. System capacity has three components: technical, managerial, and financial. Completing this asset inventory will help you improve all three components by:

- Increasing your knowledge of the physical components of your system, which will allow you to make better technical and managerial decisions.
- Identifying components that may need to be replaced or rehabilitated in the near future, which will enable you to develop a financial plan and research cost-effective options.

Inventorying your assets can be an intensive job. Get the best information you can, but use estimates if you need to. If you keep up with an asset management program, new information will become available as assets are replaced or rehabilitated, and your inventory of assets will improve.

Elements of a Simple Asset Inventory

A note to the users of this brochure: It's quite likely that all of the details of the asset management plan presented in this brochure will not apply to every small drinking water system. You should feel free to modify the worksheets and plan so they conform to the particular needs of your system. Help in using this document, conducting asset inventories, and preparing future plans is available from your State or Tribal Drinking Water Primacy Agency.



How Long Will It Last? Using the Typical Life Expectancies Table

One of the most important aspects of managing your assets is determining how much longer you think they will last. A number of factors can affect how long your assets will last, including routine service and proper maintenance, excessive use, and environmental conditions such as poor source water quality, soil quality, or climate.

The worksheets on the following pages ask you to:

1. Determine the **adjusted useful life** of each asset. Estimate how long the asset should last (the expected useful life) and adjust these numbers based on the specific conditions and experiences of your system. The useful life of an asset will be affected by water quality, operation and maintenance routines, the number of years the asset lasted in the past, the asset's service history, and its current condition.

For help in determining the adjusted useful life, you can use the table on this page and talk to parts distributors, your State or Tribal Drinking Water Primacy Agency, and other public water systems.

2. Subtract the **estimated age** of each asset from its **adjusted useful life** to determine its **remaining useful life** (or how many months or years remain before you will have to replace or significantly rehabilitate the asset).

Remember!

A preventive maintenance program will enable you to maximize the useful lives of your assets and can help you avoid problems and cut down or delay replacement costs. Contact your State or Tribal Drinking Water Primacy Agency for more information on developing and implementing a preventive maintenance program.

How Long Will it Last?

Typical Life Expectancies of Water System Equipment

Component	Worksheet	Useful Life
Wells and Springs	Drinking Water Source	25 years
Intake Structures		35 years
Pumping Equipment		10 years
Disinfection Equipment	Treatment System	5 years
Hydropneumatic Tanks	Tanks	10 years
Concrete and Metal Storage Tanks		30 years
Transmission Structures (Pipes)	Distribution System	35 years
Valves	Valves	35 years
Mechanical Valves		15 years
Computer Equipment/Software	Electrical Systems	5 years
Transformers/Switchgears/Wiring		20 years
Motor Controls/Variable Frequency Drives		10 years
Sensors		7 years
Buildings	Buildings	30 years
Service Lines	Service Lines	30 years
Hydrants	Hydrants	40 years

Note: These expected useful lives are drawn from a variety of sources. The estimates assume that assets have been properly maintained. The adjusted useful life of an asset will be equal to or less than typical useful life.

Drinking Water Source: Completed Example

Well Construction

Obtain a well log or look at receipts from the time of drilling for the following information. Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Drilling Contractor	Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
J&C Construction	25 years	-	8 years old	=	17 years

Remember that the typical useful life of wells and springs is 25 years and that the typical useful life of pumping equipment is 10 years. Use this as a basis for determining the adjusted useful life of your well or spring and pump and pump controls. In this example, the typical useful lives equal the adjusted useful lives because the well, pumps, and controls have been properly maintained.

Whom would you call to service your well? This may be the well driller.

Company/Agency	Contact	Telephone Number
J&C Construction	John Smith	(800) 555-7788

Well Pump and Controls

Look at receipts or records from the time of installation for the following information:

Pump Manufacturer	Well Pump Model Number (typically located on pump casing. If buried, look for information near the electrical system.)
Peter's Pumps	ZZ-0001234

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
10 years	-	5 years old	=	5 years

Whom would you call to service your pumps and controls? This may be the pump manufacturer or installer.

Company/Agency	Contact	Telephone Number
Peter's Pumps	Peter Williams	(800) 555-1212

Date Worksheet Completed or Revised
8/1/04



A Ground Water System Well

Drinking Water Source

Well Construction

Obtain a well log or look at receipts from the time of drilling for the following information. Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Drilling Contractor	Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
		-		=	

Remember that the typical useful life of wells and springs is 25 years and that the typical useful life of pumping equipment is 10 years. Use this as a basis for determining the adjusted useful life of your well or spring and pump and pump controls.

Whom would you call to service your well? This may be the well driller.

Company/Agency	Contact	Telephone Number

Well Pump and Controls

Look at receipts or records from the time of installation for the following information:

Pump Manufacturer	Well Pump Model Number (typically located on pump casing. If buried, look for information near the electrical system.)

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
	-		=	

Whom would you call to service your pumps and controls? This may be the pump manufacturer or installer.

Company/Agency	Contact	Telephone Number

Date Worksheet Completed or Revised



A Ground Water System Well

Intake Structures: Completed Example

Intake Structures: Concrete Catch Basin

Look at receipts or records from the time of installation for the following information:

Adjusted Useful Life - Estimated Age = Remaining Useful Life

35 years - **15 years old** = **20 years**

Remember that the typical useful life of concrete catch basins is 35 years. Use this as a basis for determining your concrete catch basin's adjusted useful life. In this example, the adjusted useful life equals the typical useful life because the concrete catch basin has been properly maintained.

Intake Structures: Underwater Pipe

Look at receipts or records from the time of installation for the following information:

Adjusted Useful Life - Estimated Age = Remaining Useful Life

15 years - **5 years old** = **10 years**

Remember that the typical useful life of underwater pipes is 15 years. Use this as a basis for determining your underwater pipe's adjusted useful life. In this example, the adjusted useful life equals the typical useful life because the intake structure has been properly maintained.

Whom would you call to service your intake structures?

Company/Agency	Contact	Telephone Number
Chris' Contractors	Chris Carpenter	(555) 123-4567

Whom would you call if you had a potential wellhead protection problem? You can find the appropriate contact by calling the Safe Drinking Water Hotline at (800) 426-4791 or by contacting your State or Tribal Drinking Water Primacy Agency.

Regulatory Agency	Contact	Telephone Number
Natural Resources Dept.	Walt Greenleaf	(555) 498-9898

Date Worksheet Completed or Revised

8/1/04



A Drinking Water Intake for a Surface Water System

Intake Structures

Intake Structures: Concrete Catch Basin

Look at receipts or records from the time of installation for the following information:

Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
	-		=	

Remember that the typical useful life of concrete catch basins is 35 years. Use this as a basis for determining your concrete catch basin's adjusted useful life.

Intake Structures: Underwater Pipe

Look at receipts or records from the time of installation for the following information:

Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
	-		=	

Remember that the typical useful life of underwater pipes is 15 years. Use this as a basis for determining your underwater pipe's adjusted useful life.

Whom would you call to service your intake structures?

Company/Agency	Contact	Telephone Number

Whom would you call if you had a potential wellhead protection problem? You can find the appropriate contact by calling the Safe Drinking Water Hotline at (800) 426-4791 or by contacting your State or Tribal Drinking Water Primacy Agency.

Regulatory Agency	Contact	Telephone Number

Date Worksheet Completed or Revised



A Drinking Water Intake for a Surface Water System

Treatment System: Completed Example

Many systems are required to disinfect their water as treatment against common disease-causing organisms (bacteria, viruses, and protozoa). The characteristics of your water source and the regulations of your state will dictate what type of treatment system, if any, your drinking water system needs.

Look at receipts or records from the time of installation for the following information:

Treatment System Name	Manufacturer	
Chlorinator	Carl's Chlorinators	
Model Number (may be located on the apparatus)		
CL-00987		
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	- Estimated Age	= Remaining Useful Life
5 years	- 3 years old	= 2 years
Whom would you call to service your treatment system? This may be the manufacturer or installer.		
Company/Agency	Contact	Telephone Number
Carl's Chlorinators	Carl Cooper	(555) 333-9876
Date Worksheet Completed or Revised		
8/1/04		

Remember that the typical useful life of disinfection systems is 10 years. In this example, adjusted useful life for the chlorinator is 5 years lower than the typical useful life because the system has not properly maintained it.



A Chlorination System

Treatment System

Many systems are required to disinfect their water as treatment against common disease-causing organisms (bacteria, viruses, and protozoa). The characteristics of your water source and the regulations of your state will dictate what type of treatment system, if any, your drinking water system needs.

Look at receipts or records from the time of installation for the following information:

Treatment System Name	Manufacturer	Remember that the typical useful life of disinfection systems is 10 years.	
Model Number (may be located on the apparatus)			
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.			
Adjusted Useful Life	-	Estimated Age	= Remaining Useful Life
	-		=
Whom would you call to service your treatment system? This may be the manufacturer or installer.			
Company/Agency	Contact	Telephone Number	
Date Worksheet Completed or Revised			



A Chlorination System

Tanks: Completed Example

Your system will most likely use one of the following types of tanks:

A **hydropneumatic tank** is automatically started and stopped by the air pressure in a compressed-air or captive-air chamber. The air in the tank maintains pressure throughout the distribution system.

A **concrete reservoir** is a structure that is either cast in place or pre-cast to be used for water storage.

A **metal reservoir** is a water storage tank constructed by welding or bolting galvanized or painted plates of metal.

Remember that the typical useful life of tanks can vary. Concrete and metal tanks generally last 30 years. Hydropneumatic tanks generally last 10 years. In this example, the adjusted useful life is the same as the typical useful life because the tank has been properly maintained.

Look at receipts or records from the time of installation for the following information:

Type of Tank (hydropneumatic, concrete reservoir, metal reservoir)	Size	Manufacturer
Hydropneumatic	100 gallons	Paul's Pressurized Tanks

Major Maintenance

Pressure tested, 2002

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life	- Estimated Age	= Remaining Useful Life
10 years	- 5 years old	= 5 years

Whom would you call to service your pressure tank?

Company/Agency	Contact	Telephone Number
Paul's Pressurized Tanks	Paul Pullman	(555) 999-7777

Date Worksheet Completed or Revised

8/1/04



A Hydropneumatic Storage Tank



A Metal Storage Tank

Tanks

Your system will most likely use one of the following types of tanks:

A **hydropneumatic tank** is automatically started and stopped by the air pressure in a compressed-air or captive-air chamber. The air in the tank maintains pressure throughout the distribution system.

A **concrete reservoir** is a structure that is either cast in place or pre-cast to be used for water storage.

A **metal reservoir** is a water storage tank constructed by welding or bolting galvanized or painted plates of metal.

Remember that the typical useful life of tanks can vary. Concrete and metal tanks generally last 30 years. Hydropneumatic tanks generally last 10 years.

Look at receipts or records from the time of installation for the following information:

Type of Tank (hydropneumatic, concrete reservoir, metal reservoir)	Size	Manufacturer

Major Maintenance

--

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life - Estimated Age = Remaining Useful Life

	-		=	
--	---	--	---	--

Whom would you call to service your pressure tank?

Company/Agency	Contact	Telephone Number

Date Worksheet Completed or Revised

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A Hydropneumatic Storage Tank



A Metal Storage Tank

Distribution System: Completed Example

You may want to note the location of shut-off valves to isolate particular sections of the system in case of an emergency.

You may also want to note the location of "as-built" drawings showing the layout of the distribution system.

If your system has many types of pipe (e.g., different size, different material), reproduce this worksheet and list the information for each type.

Remember that the typical useful life of pipes is 35 years. In this example, the system has estimated that the adjusted useful life will be the same as the typical useful life because in the past its distribution system pipes have lasted for the typical number of years.

Look at receipts or records from the time of installation for the following information:

Type of Pipe	Size	Length (feet)
PVC	3-inch	2,200 feet

Where Used or Located

Main St. Line

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
35 years	-	21 years old	=	14 years

Whom would you call to service your pipes?

Company/Agency	Contact	Telephone Number
Chris' Contracting	Chris Carpenter	(555) 123-4567

Date Worksheet Completed or Revised

8/1/04



Preparations for Pipe Installation in a Distribution System

Distribution System

You may want to note the location of shut-off valves to isolate particular sections of the system in case of an emergency.

You may also want to note the location of "as-built" drawings showing the layout of the distribution system.

If your system has many types of pipe (e.g., different size, different material), reproduce this worksheet and list the information for each type.

Remember that the typical useful life of pipes is 35 years.

Look at receipts or records from the time of installation for the following information:

Type of Pipe	Size	Length (feet)

Where Used or Located

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life	-	Estimated Age	=	Remaining Useful Life
	-		=	

Whom would you call to service your pipes?

Company/Agency	Contact	Telephone Number

Date Worksheet Completed or Revised



Preparations for Pipe Installation in a Distribution System

Valves: Completed Example

Valves can be used to isolate portions of the distribution system for cleaning, maintenance, and repairs. In addition, valves regulate flow and pressure.

Air-relief valves (or manual bleeds) are used to release trapped air and prevent surge problems when lines are filled. They also can eliminate water hammer (a condition in which pressure in the pipes increases and decreases very quickly, possibly damaging the tank, valves, piping network, and customers' plumbing). These valves respond to pressure variations.

Blowoff valves are used to eliminate accumulated sediment or stagnant water from low spots or dead ends in the line and can be used to dewater lines or reservoirs for repairs or inspection.

Backflow prevention valves and devices eliminate reverse flow conditions to prevent contamination in the system's distribution pipes.

If your system uses more than one type of valve, reproduce this worksheet and list the information for each type.

Look at receipts or records from the time of installation for the following information:

Valve type (air-relief, blowoff, etc.)	Number of Valves	Size	Manufacturer
Air Relief	5 Valves	4"	Veronica's Valves

Remember that the typical useful life of valves is 35 years. In this example, the adjusted useful life is lower than the typical useful life because of the system's source water characteristics and lack of routine maintenance.

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life - Estimated Age = Remaining Useful Life

20 years - **3 years old** = **17 years**

Whom would you call to service your valves?

Company/Agency	Contact	Telephone Number
Veronica's Valves	Veronica Johnson	(555) 555-6789

Date Worksheet Completed or Revised

8/01/04



An Air-Pressure Relief Valve

Valves

Valves can be used to isolate portions of the distribution system for cleaning, maintenance, and repairs. In addition, valves regulate flow and pressure.

Air-relief valves (or manual bleeds) are used to release trapped air and prevent surge problems when lines are filled. They also can eliminate water hammer (a condition in which pressure in the pipes increases and decreases very quickly, possibly damaging the tank, valves, piping network, and customers' plumbing). These valves respond to pressure variations.

Blowoff valves are used to eliminate accumulated sediment or stagnant water from low spots or dead ends in the line and can be used to dewater lines or reservoirs for repairs or inspection.

Backflow prevention valves and devices eliminate reverse flow conditions to prevent contamination in the system's distribution pipes.

If your system uses more than one type of valve, reproduce this worksheet and list the information for each type.

Look at receipts or records from the time of installation for the following information:

Valve type (air-relief, blowoff, etc.)	Number of Valves	Size	Manufacturer
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.			
Adjusted Useful Life	-	Estimated Age	= Remaining Useful Life
	-		=
Whom would you call to service your valves?			
Company/Agency	Contact	Telephone Number	
Date Worksheet Completed or Revised			

Remember that the typical useful life of valves is 35 years.



An Air-Pressure Relief Valve

Electrical Systems: Completed Example

Electrical systems help control the automatic components of a water system. Your electrical systems may include transformers, motor control centers (MCCs), variable frequency drives (VFDs), power supplies, alarm circuits, sensors (level indicators, pH, flow meters), computers, wiring, and other instrumentation. If your system uses multiple types of electrical systems, reproduce this worksheet and list the information for each type.

Look at receipts or records from the time of installation for the following information:

Type of Equipment (MCC, VFD, etc).	Number of Units	Size of Units (HP, voltage, Kva)
Computer	2	Pentium III 256 RAM computers
Manufacturer	Model Number	
Carlos' Computer Shack	CC-5657; CC-5658	
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	-	Estimated Age = Remaining Useful Life
5 years	-	2 years old = 3 years
Whom would you call to service your electrical components?		
Company/Agency	Contact	Telephone Number
Carlos' Computer Shack	Carlos Rodriguez	(555) 345-6788
Date Worksheet Completed or Revised		
8/1/04		

Remember that the typical useful life varies by type of electrical equipment. The typical useful life for computers is 5 years, sensors typically last 7 years, MCCs, and VFDs typically last 10 years, and transformers, switchgears, and wiring typically last 20 years. In this example, the adjusted useful life is the same as the typical useful life because the computer has been properly maintained.



A Variable Frequency Drive

Electrical Systems

Electrical systems help control the automatic components of a water system. Your electrical systems may include transformers, motor control centers (MCCs), variable frequency drives (VFDs), power supplies, alarm circuits, sensors (level indicators, pH, flow meters), computers, wiring, and other instrumentation. If your system uses multiple types of electrical systems, reproduce this worksheet and list the information for each type.

Look at receipts or records from the time of installation for the following information:

Type of Equipment (MCC, VFD, etc).	Number of Units	Size of Units (HP, voltage, KvA)
Manufacturer	Model Number	
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	-	Estimated Age = Remaining Useful Life
	-	=
Whom would you call to service your electrical components?		
Company/Agency	Contact	Telephone Number
Date Worksheet Completed or Revised		

Remember that the typical useful life varies by type of electrical equipment. The typical useful life for computers is 5 years, sensors typically last 7 years, MCCs, and VFDs typically last 10 years, and transformers, switchgears, and wiring typically last 20 years.



A Variable Frequency Drive

Buildings: Completed Example

If you need more space to list all your buildings, reproduce this worksheet and list the information on separate pages.

Remember that the typical useful life of buildings is 30 years. In this example, the adjusted useful life for the roof is the same as the age (16 years), since it is leaking and should be repaired now. The adjusted useful life for the rest of the building is the same as the typical useful life.

Look at receipts or records from the time of installation for the following information:

Structure Use	Structure Type (building, shed, manufactured home)	
Administrative Facilities	Manufactured Home	
Major Maintenance Needed		
Roof repairs due to leaking problems		
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	-	Estimated Age = Remaining Useful Life
30 years Roof: 15-20 years	-	16 years old = Leaking roof should be repaired now. Rest of building: 14 years
Whom would you call to service your building?		
Company/Agency	Contact	Telephone Number
Mark's Maintenance	Mark Mullins	(555) 444-6666
Date Worksheet Completed or Revised		
8/1/04		



A Pumphouse

Buildings

If you need more space to list all your buildings, reproduce this worksheet and list the information on separate pages.

Remember that the typical useful life of buildings is 30 years.

Look at receipts or records from the time of installation for the following information:

Structure Use	Structure Type (building, shed, manufactured home)	
Major Maintenance Needed		
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	-	Estimated Age = Remaining Useful Life
	-	=
Whom would you call to service your building?		
Company/Agency	Contact	Telephone Number
Date Worksheet Completed or Revised		



A Pumphouse

Service Lines: Completed Example

The service line is composed of the parts that are necessary to deliver water from the main to the customer's or user's plumbing connection. Each service line typically provides service for one or two users or connections. If you have more than one type of service line, reproduce this page and list the information on separate pages.

Look at receipts or records from the time of installation for the following information:

Ownership of Lines	Size of Lines (inches)		
Water system owns all lines	1-inch		
Number of Lines	Approximate Length of Lines		
42	75 ft. each		
Material of Lines			
PVC			
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.			
Adjusted Useful Life	-	Estimated Age	= Remaining Useful Life
30 years	-	6 years old	= 24 years
Whom would you call for service line maintenance?			
Company/Agency	Contact	Telephone Number	
Chris' Contractors	Chris Carpenter	(555) 123-4567	
Date Worksheet Completed or Revised			
8/1/04			

Remember that the typical useful life for service lines is 30 years. In this example, the system has estimated that the adjusted useful life will be the same as the typical useful life because in the past its distribution system assets have lasted the typical number of years.



Service Lines Deliver Water to the Customer's Plumbing Connection

Service Lines

The service line is composed of the parts that are necessary to deliver water from the main to the customer's or user's plumbing connection. Each service line typically provides service for one or two users or connections. If you have more than one type of service line, reproduce this page and list the information on separate pages.

Look at receipts or records from the time of installation for the following information:

Ownership of Lines	Size of Lines (inches)		
Number of Lines	Approximate Length of Lines		
Material of Lines			
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.			
Adjusted Useful Life	-	Estimated Age	= Remaining Useful Life
	-		=
Whom would you call for service line maintenance?			
Company/Agency	Contact	Telephone Number	
Date Worksheet Completed or Revised			

Remember that the typical useful life for service lines is 30 years.



Service Lines Deliver Water to the Customer's Plumbing Connection

Hydrants: Completed Example

If your system uses different types of hydrants (e.g., dry-barrel, wet-barrel), reproduce this worksheet and list the information for all types of hydrants.

If your system is not responsible for the hydrants, note the contact for flushing and maintenance.

Look at receipts or records from the time of installation for the following information:

Type of Hydrant	Diameter of Pipe (inches)	
Dry-Barrel	6-inch	
Type	Size of Nozzle	
2-nozzle	2 1/2 inch	
Number of Flush Valve Vaults	Number of Hydrants	Manufacturer
0	2	M&H
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	-	Estimated Age = Remaining Useful Life
40 years	-	23 years old = 17 years
Whom would you call for hydrant maintenance?		
Company/Agency	Contact	Telephone Number
Chris' Contracting	Chris Carpenter	(555) 123-4567
Date Worksheet Completed or Revised		
8/1/04		

Remember that the typical useful life for hydrants is 40 years. In this example, the adjusted useful life is the same as the typical useful life because both hydrants have been properly maintained.



Hydrants Provide Water for Fire Suppression, Line Flushing, and Irrigation

Hydrants

If your system uses different types of hydrants (e.g., dry-barrel, wet-barrel), reproduce this worksheet and list the information for all types of hydrants.

If your system is not responsible for the hydrants, note the contact for flushing and maintenance.

Look at receipts or records from the time of installation for the following information:

Remember that the typical useful life for hydrants is 40 years.

Type of Hydrant	Diameter of Pipe (inches)	
Type	Size of Nozzle	
Number of Flush Valve Vaults	Number of Hydrants	Manufacturer
Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.		
Adjusted Useful Life	- Estimated Age	= Remaining Useful Life
	-	=
Whom would you call for hydrant maintenance?		
Company/Agency	Contact	Telephone Number
Date Worksheet Completed or Revised		



Hydrants Provide Water for Fire Suppression, Line Flushing, and Irrigation.

Next Steps: Asset Management Plan

Once you have completed the worksheets in this booklet, you can use them to develop an asset management plan. Asset management is a planning process that ensures that you get the most value from each of your assets and have the financial resources to rehabilitate and replace them when necessary. The worksheets on the following pages will guide you through the process of creating an asset management plan.

A completed asset management plan will help you:

- Prioritize your assets to make sure that you allocate funds to the rehabilitation or replacement projects that are most urgent and most important for system operation and customer safety.
- Estimate how much money you will need to set aside each year to pay for the replacement or rehabilitation of your assets.

You should review, revise, and update the worksheets in this booklet, including your asset management plan, at least once a year. Updated information in the worksheets will give you a better picture of your system's position and better prepare you to meet your water system's future needs.

For more complete information on how to develop and implement an asset management plan, see EPA's *Asset Management: A Handbook for Small Water Systems* (EPA 816-R-03-016), which you can obtain by calling the Safe Drinking Water Hotline at (800) 426-4791.

Just as an asset inventory is one part of asset management, asset management is part of a larger management concept called strategic planning. Strategic planning helps you prepare for and address anticipated and unexpected problems. It uses asset management to evaluate your system's current physical situation, and it also evaluates your system's financial and managerial situation. It requires you to make fundamental decisions about your water system's purpose, structure, and functions.

For more information on strategic planning, see EPA's *Strategic Planning Workbook* (EPA 816-R-03-015), which you can obtain by calling the Safe Drinking Water Hotline at (800) 426-4791.



A Storage Tank that Has Outlived Its Useful Life!

Prioritization Table

Use the inventory information you collected on the worksheets to fill out the prioritization table. Consider how important the asset is to your ability to provide safe drinking water to your customers, how soon you will need to replace an asset to adequately serve your customers (its remaining useful life), and how important the asset is to the operation of your system (can other assets do the same job?).

- In the column labeled “Asset,” list a short name for the asset (e.g., chlorinator). List different components of the asset on separate lines.
- In the column labeled “Remaining Useful Life,” enter the value you determined for that asset on its worksheet (earlier in the booklet). Components of your asset that have different remaining useful lives should be listed on separate lines. For example, the building roof and the building structure in the example on page 19 have different useful lives and, therefore, should be listed separately.
- In the column labeled “Importance,” describe the importance of each asset to the operation of your system and the protection of public health. Assets that are required to keep your system running are usually more important than assets that just make its operation more efficient. Assets that may affect public health are more important than those that improve the aesthetics of your water. Assets without a backup unit available (i.e., there is no redundant unit) should have a higher priority than units that have a backup (i.e., a redundant unit).
- In the column labeled “Priority,” rank your assets according to how important it is to reserve money for them. Consider impact on public health, remaining useful life, and importance to your system’s operation when ranking your assets.

Things to Keep in Mind

- Assets that are **more important** to your ability to deliver safe water should have a higher priority because these assets affect public health.
- Assets with **short remaining useful lives** should have a higher priority because you will have to replace these assets soon.
- Assets for which there is **less redundancy** should have a higher priority because your system will have trouble continuing to operate without them.

Prioritizing Your Assets: Completed Example

Asset	Remaining Useful Life	Importance	Priority	Notes
Administrative building (roof)	1 year -- leaking roof should be repaired	Medium	2	
Chlorinator	2 years	High -- system cannot operate without it	1	
Hydropneumatic Tank	12 years	High -- maintains pressure in the system	3	
Computer	3 years	Medium	4	

Prioritizing Your Assets

Asset	Remaining Useful Life	Importance	Priority	Notes

Budgeting for Rehabilitations and Replacements

Once you have inventoried and prioritized your assets, you should determine how much money you will need to rehabilitate or replace them. Budgeting for these projects now can help avoid large, unplanned expenditures in the future and will ensure that you allocate your resources efficiently.

The worksheet on page 32 will help you figure out how much money you need to reserve each year to fund your highest priority activities.

It is important that you update this worksheet every year, and as new information becomes available, because your system's priorities and finances may change. Costs of new assets or rehabilitations may also change. Updating your worksheet annually and setting aside the required reserve amount will help ensure that you have enough money to cover rehabilitations and replacements when you need them.

Remember that although the total reserves needed each year may seem like a lot of money, it is easier to put aside \$200 a year to replace a chlorinator than to come up with \$2,000 once it fails.

The budgeting worksheet asks for the estimated cost of rehabilitation and replacement activities associated with your highest priority assets. Remember to gather information on all of the costs associated with the rehabilitation or replacement of an asset, such as equipment purchase, installation, pilot tests, labor charges, cleanup, and disposal of the replaced asset. To determine what a rehabilitation or replacement might cost, you can:

- Consult with your State or Tribal Drinking Water Primacy Agency;
- Ask local contractors and businesses for estimated costs;
- Contact equipment manufacturers; and
- Talk to other systems about the cost of their rehabilitations or replacements.

The budgeting worksheet does not include standard operation and maintenance costs such as chemicals for disinfection. It accounts only for funds you will need to replace or rehabilitate your assets. You should keep standard operation and maintenance costs in mind when thinking about financing your asset management plan.

Budgeting Table

The table on the next page will help you determine how much money you will need to set aside each year to ensure you can continue to deliver safe and secure drinking water to your customers and pay for the necessary replacement of your assets. A completed example follows the blank worksheet.

- In the column labeled “Asset,” list the short name for your asset (e.g., chlorinator). You should list different components of the asset on separate lines.
- In the column labeled “Activity,” list the rehabilitation and replacement activities that you expect to perform. Provide enough detail so that you can determine the cost of each activity.
- In the column labeled “Cost,” fill in the expected cost of each activity. Make sure to include the complete cost including preparation, cleanup, and disposal of any waste.
- In the column labeled “Years Until Action Needed,” fill in the remaining useful life of the asset from the inventory worksheets you completed earlier.
- Divide the cost by the years until action needed. Enter the result in the column labeled “Reserve Required Each Year.” This is the amount of money you will have to set aside each year to ensure that you have enough money to perform the required activity in the allotted time.
- Add up the amounts in the “Reserve Required Each Year” column and enter the total in the box marked “Total Per Year.” This is the amount of money you should be setting aside each year to be able to pay for all of your planned replacements or rehabilitations.

Budgeting for Rehabilitation and Replacement of Assets: Completed Example

Asset	Activity	Cost	Years Until Action Needed	Reserve Required Each Year
Chlorinator	Replace unit	\$2,000	3	\$667
Administrative Building (roof)	Repair roof	\$1,500	1	\$1,500
Hydropneumatic Tank	Replace unit	\$300	13	\$23
Computer	Replace unit	\$1,000	4	\$250
Total per year				\$2,440

Budgeting for Rehabilitation and Replacement of Assets

Asset	Activity	Cost	Years Until Action Needed	Reserve Required Each Year
Total Per Year				

How to Carry out the Plan

It may be overwhelming to see how much money you should be saving each year to fund the replacement and rehabilitation of your assets. You can finance capital improvements by saving the total per year cost of replacements (calculated in the budgeting table) in a reserve account. Alternatively, you can use the money you already have more efficiently and put the savings towards replacing and rehabilitating your assets. Here are some strategies that could help you use your current resources more efficiently or raise additional funds:

- Form partnerships with other water systems to reduce operating costs. This may allow you to simplify management and obtain bulk purchasing agreements.
- Consider charging rates or increasing your rates to raise revenue. If your system does not already do so, you can charge your customers a separate fee for water. Alternatively, consider assessing a flat fee for infrastructure improvements or for funding a reserve account. Check with your State or Regional Tribal Drinking Water Primacy Agency for more information on setting rates.
- Apply for financial assistance. Banks and government agencies can help fund infrastructure projects such as treatment system upgrades and distribution line repairs. For large projects, you may want to research funding options such as state and federal drinking water grant and loan programs. Appendix B lists some sources of funding for which your system may qualify. Consult your State or Regional Tribal Drinking Water Primacy Agency for information on funding sources that might be available to your system.

The Role of Key Decision Makers

Key decision makers (for example, the Board of Directors of the Association, elected officials of the community, or owners of manufactured housing associations) make critical decisions about the finances of your water system. For this reason, they need to understand the financial requirements related to the rehabilitation and replacement of the system's equipment and assets. The information compiled in this brochure should be presented to key decision makers and incorporated into the annual budget. This information should be reviewed annually and modified as necessary. The key decision makers can also present this information to the public at a board meeting and in the water system's annual Consumer Confidence Report.

Next Steps

Once you have completed the worksheets and tables in this brochure and identified your system's needs, you can use the results to help you evaluate your infrastructure and shape decisions about your water system. Do not stick the worksheets and tables in a drawer and forget about them! You should try to review the worksheets at least once a year and make changes as your system's situation changes. Developing a good picture of when you will need to replace your assets and how much money you will need to fund those replacements will allow you to continue to deliver safe and secure drinking water to your customers.

Remember!

The worksheets in this guide could contain sensitive information about your water system. Make sure you store the worksheets, as well as all other information about your system's assets, in a secure location.

Appendix A: Contacts and Resources

For additional information or to learn more about the laws in your own state, please contact your EPA Regional Coordinator or State or Tribal Drinking Water Primacy Agency.

State and EPA Regional Contacts information can be found here: <https://www.epa.gov/dwcapacity/find-epa-capacity-development-contact>

Tribal Contacts can be found here: <https://www.epa.gov/tribaldrinkingwater/regional-tribal-drinking-water-coordinators>

For more information about asset management resources, visit: <https://www.epa.gov/dwcapacity/asset-management-resources-small-drinking-water-systems-0>

Other Organizations

- National Rural Water Association, www.nrwa.org
- Rural Community Assistance Partnership, www.rcap.org
- American Water Works Association, www.awwa.org
- Manufactured Housing Institute, www.manufacturedhousing.org
- Environmental Finance Center Network: <http://efcnetwork.org/>

Appendix B: Sources of Financial Assistance to Drinking Water Systems

System improvements can be funded by raising rates and obtaining loans or grants. The table below provides information on some programs that may provide financial assistance to help you maintain assets in good condition, replace deteriorated assets that have outlived their useful lives, and continue to provide safe and secure drinking water to your customers. Consult your State or Regional Tribal Drinking Water Primacy Agency for additional information. For information on sources of financial assistance for drinking water systems, see EPA's Water Finance Clearinghouse: <https://ofmpub.epa.gov/apex/wfc/f?p=165:1>

Major Providers of Financial Assistance to Drinking Water Systems		
Program	Description	Contact Information
Drinking Water State Revolving Fund (DWSRF)	These state-administered loan programs enable water systems to finance infrastructure improvements, provide training, and fund source water protection activities.	https://www.epa.gov/drinkingwatersrf
Rural Utilities Service (RUS) Water and Wastewater Loan and Grant Program	This program offers loans and grants to develop water and waste-disposal systems in rural areas.	https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program
State-specific programs	Your state may offer additional funding programs.	See Appendix A for state contact information
Tribal-specific programs	EPA gives grants to tribes through the DWSRF Tribal Set-Aside Program for improvements to water systems that serve tribes. States and the Indian Health Service may provide additional assistance.	See Appendix A for tribal contact information
Manufactured Housing Institute	The Manufactured Housing Institute provides information on loan programs for manufactured homes to its members. It also offers forums to interact with financial services companies that cater to the manufactured homes market.	www.manufacturedhousing.org