

THE STORY OF OUR WATER INFRASTRUCTURE

Liquid Assets

produced by

WPSU

PENN STATE PUBLIC BROADCASTING

**COMMUNITY
TOOLKIT
OUTREACH GUIDE**

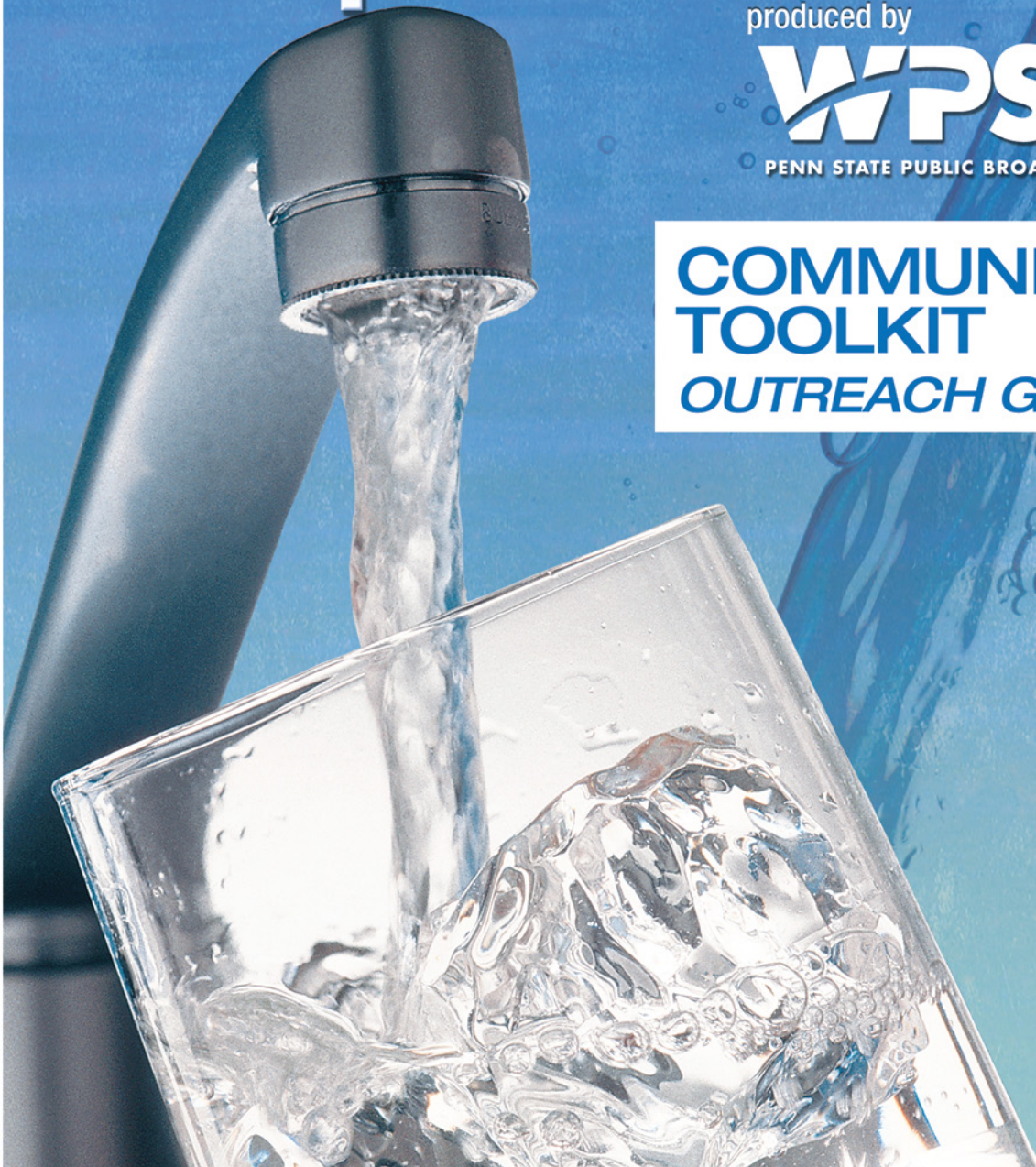


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COMMUNITY DISCUSSIONS GUIDE

This guide provides suggestions for planning community discussions about the *Liquid Assets* documentary and local water infrastructure issues.

It is meant for public broadcasting stations, municipalities, community groups, and other stakeholders with an interest in raising public awareness of the challenges facing U.S. water infrastructure.

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Why community discussions are important

Liquid Assets: The Story of Our Water Infrastructure raises timely issues that are relevant to cities and towns across the United States. Water infrastructure plays a critical role in protecting public health, promoting economic prosperity, and ensuring a good quality of life. Though largely out of sight and out of mind, many of these complex systems are aging, neglected, and in need of immediate national and local attention. Whether the challenges call for immediate action or require long-term planning, communities throughout the country are facing big financial hurdles and the serious consequences of an aging water infrastructure.

Because many people share the same watershed, communities will need to work across boundaries to ensure safe and effective water systems now and into the future. In community discussions, people can share ideas, communicate local issues, build lasting relationships, and plan for the future.

Video resources

The *Liquid Assets* documentary is available on DVD so it can be viewed and discussed at any time. The DVD includes the full-length documentary, a four-minute preview, and a 16-minute overview. The documentary is chaptered so that groups can use the sections that are most relevant to their local circumstances and concerns. Whether community groups show the entire documentary or just a portion, *Liquid Assets* will help make it easier for people to understand the importance and complexities of our water infrastructure.

Potential community partners

Community groups may want to consider partnering with other groups on a community discussion. Different groups bring a variety of perspectives, relationships and networks, water expertise, and organizational assets to the table.

Examples of valuable community partners:

- public television stations (managers, programmers, and community relations staff)
- public radio stations
- municipalities
- water utilities
- local and regional offices and chapters of the *Liquid Assets* outreach partners:
 - » American Society of Civil Engineers (ASCE)
 - » International City/County Management Association (ICMA)
 - » National Environmental Services Center (NESC)
 - » Your local Cooperative Extension
- Water Environment Federation, American Water Works Association and other water organizations.
- All the *Liquid Assets* outreach funders listed at www.liquidassets.psu.edu
- civic groups
- city or county managers
- government officials
- realtors' associations
- chambers of commerce
- service organizations such as Kiwanis, Rotary, and Lions clubs
- community or university libraries
- property owners, developers, and neighborhood associations
- fraternal organizations, such as VFW and Elks
- League of Women Voters
- environmental groups or clubs

Defining local issues and goals

Community partners can collectively determine local concerns, shared goals, and which audiences to invite to their discussions. Some of the issues that the public may want to better understand and discuss are:

- the importance of water infrastructure for public health and the economy
- the complexity of the local water system
- the financial needs for sustaining our aging water infrastructure
- why water and sewage rates may increase
- federal regulations regarding water infrastructure
- how watersheds are shared by surrounding communities

Suggestions for meetings and events

Effective community discussions will require collaborative and knowledgeable partners to help make connections, a commitment to building long-term relationships, and the powerful visual images provided by the *Liquid Assets* documentary and video resources.

Local public television stations may want to conduct:

Panel Discussions

Your local public television station may want to hold a panel discussion in conjunction with the *Liquid Assets* broadcast. The panel discussion itself can be taped for local broadcast. It can bring together water and wastewater utility professionals, public officials, and community members.

Local Call-in Shows

Local public television or radio stations may want to produce call-in shows that invite the public to share their opinions in response to the airing of the documentary.

Local Productions

Local public television stations may be interested in filming their own 30-minute production to review the ways that their local water infrastructure affects the local economy and to interview experts and leaders for their perspectives. The local production could fit into the broadcast schedule immediately following the airing of the 90-minute *Liquid Assets* documentary.

Community groups may want to hold: Public Screenings of the Documentary

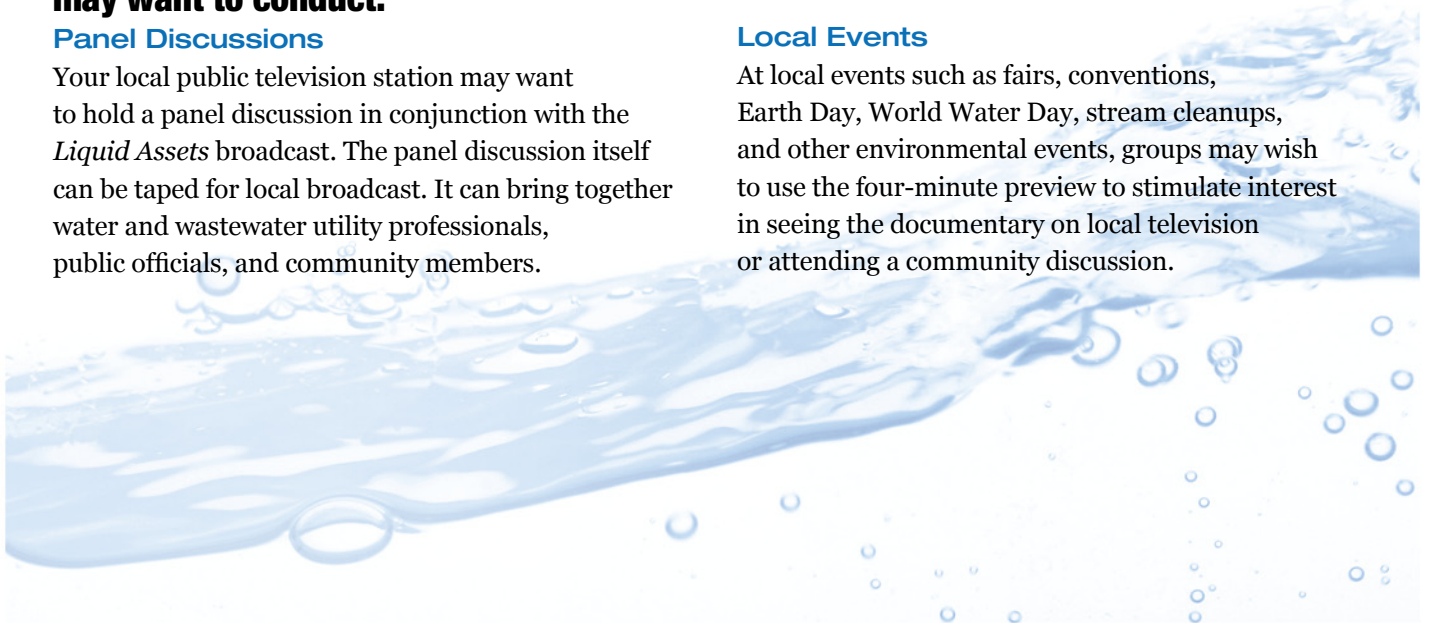
Environmental organizations, municipalities, and civic groups may want to show the entire 90-minute documentary or specific chapters at a public meeting. At the end of the screening, representatives from local government or the water company could address questions from community members.

Community Meetings

The 16-minute overview can be shown as part of a special community meeting on water infrastructure, or as part of a regularly scheduled meeting of environmental, professional, or civic organizations.

Local Events

At local events such as fairs, conventions, Earth Day, World Water Day, stream cleanups, and other environmental events, groups may wish to use the four-minute preview to stimulate interest in seeing the documentary on local television or attending a community discussion.



PLANNING AND MODERATING EVENTS

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Event planning checklist

EVENT

- Name of the event
- Type of event, such as a screening, breakfast or town hall meeting

DATE

- When will the event be held?
- Has the date/location been approved by all the necessary parties?
- Does the date conflict with other events?

TIME

- When will setup begin?
- When will the guests arrive?
- When will the event begin?
- When will the event end?
- When will breakdown end?

LOCATION

- Where will the event be held?
- Is the location accessible to the public?
- What is the room capacity?
- Is the room handicapped accessible?
- Are permits or legal paperwork required?

HOST/HOYESS/ HOSTING ORGANIZATION

- Who is hosting the event?

EVENT CO-SPONSORS

- Who else needs to be acknowledged in remarks/printed materials?
- Do they need to approve decisions/plans?

EVENT COORDINATOR

- What is the event coordinator contact information?

INVITATIONS

- Will the event require an invitation list?
- Will an invitation need to be designed/printed?
- Who will compile the invitation list?
- Who needs to approve of the invitation design and guest list?
- How many seats are expected to be filled at the event?
- Are RSVPs necessary? If so, who will be coordinating them? What is the RSVP deadline?

FOR PUBLIC EVENTS

- Will you need event promotions to secure attendance?
- Will the event require ads to be designed/placed?
- Will the event require signs/flyers to be designed/printed?
- Will the event require a release to be sent to the media?
- Should the press be invited to attend?

EXPECTED ATTENDANCE

- How many guests are expected?

BUDGET/EXPENSES

- What is the budget for this project and anticipated expenses?
- Was a maximum amount allotted for the event and its promotion?

Event arrangements checklist

Indicate arrangements, if any, for these services:

AUDIO/VISUAL

- Required?
- Remote microphones?

COAT RACK/CHECK

- Located where?

NAME TAGS

- Necessary?
- Who will create?

PARKING

- Available where?
- Available when?
- Charge?

PUBLIC FACILITIES

- Located where?

RENTALS/DELIVERIES

- Vendors?
- Arranged by?
- Delivery times?
- What services such as linens, decorations, floral arrangements, favors are required?

SEATING

- Arranged seating?
- Does a seating chart need to be created/approved?
- Where and who?

SET-UP

- Who?
- Times?

EMERGENCY NUMBERS

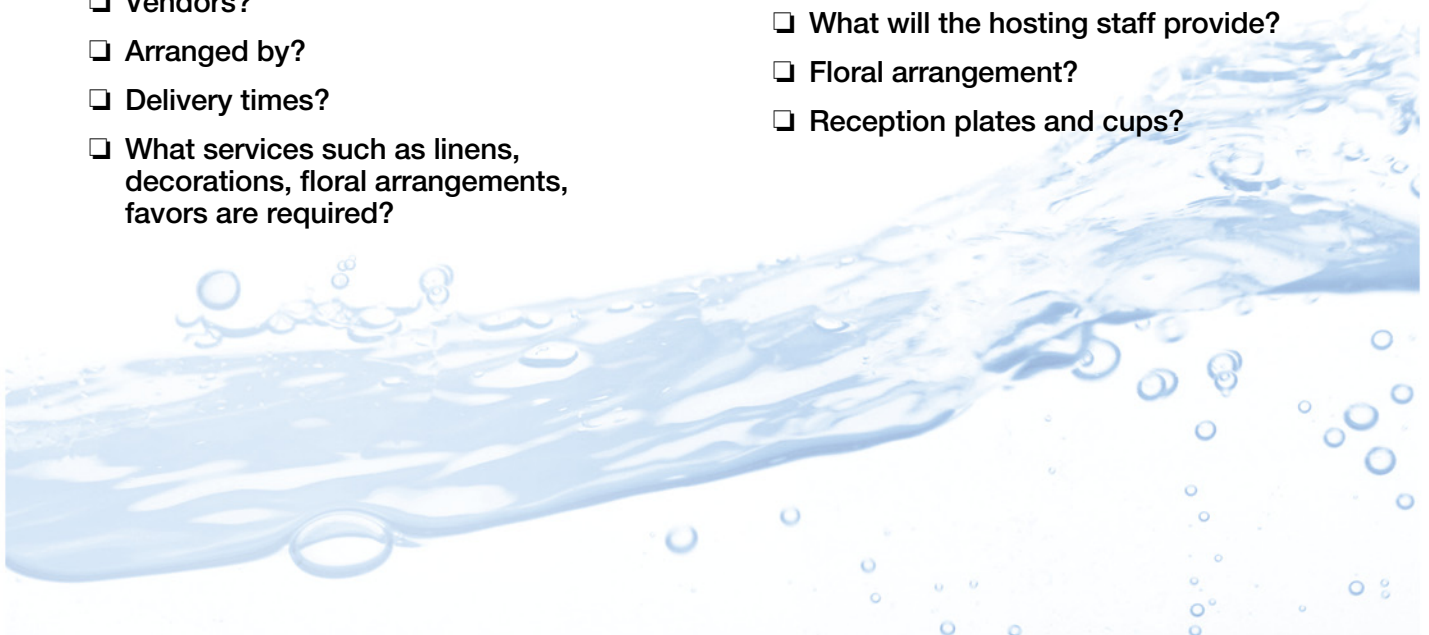
- What are the local hospital, fire, and emergency numbers?

CATERING

- Will you need a caterer?
- Contact information?
- Arrival time?
- Food/menu selections?
- What will the caterer provide, such as flatware, linens and paper products, food and beverages, setup/tear down?

HOSTING STAFF

- What will the hosting staff provide?
- Floral arrangement?
- Reception plates and cups?



Moderator guidelines checklist

PRECEDING THE EVENT

- Determine the composition and size of the prospective audience.
- Preview the *Liquid Assets* documentary on DVD, read the companion materials in the Community Toolkit (www.liquidassets.psu.edu) and browse through what is available on the Web site, to familiarize yourself and gain a full understanding of the issues the documentary raises.
- Design the agenda around the target outcome for the event (i.e., greater awareness of the water infrastructure; continued community discussion about water infrastructure).
- Based on your goals for the event, select the four-minute preview, the 16-minute overview, or specific sections of the documentary to show at the event. Refer to the chapter summaries and the video resources link in the Community Toolkit (www.liquidassets.psu.edu) to determine which videos best match local issues.
- For large groups, consider breaking into smaller groups for discussion with designated group facilitators.
- Outline key points and open-ended questions for your introduction of the video and the group discussion.
- Outline concepts to review during the wrap-up.
- Collaborate with community partners to establish plans for building upon this discussion.
- Introduce local utility, governmental, and industry representatives in attendance.
- Introduce the video(s) from the *Liquid Assets* DVD that you will be screening.
- Explain the importance of water infrastructure and why the community is holding this discussion.
- Explain that the aging water infrastructure is a nationwide problem requiring local discussion. Complex drinking, wastewater, and stormwater systems are deteriorating and must be rehabilitated and maintained.
- Describe the potential financial decisions facing the community and the consequences of aging water infrastructure.
- Ask the audience members about their infrastructure and water quality concerns. Share the discussion questions with the audience and ask them to consider these as they watch the video.
- Plan a short break after viewing the video and prior to the discussion.
- Maintain a focused discussion; ask questions to redirect the discussion if it goes off topic.
- Encourage everyone to participate in the discussion.
- If responses or comments are unclear, ask the speaker for clarification or for further explanation.
- Review key points and reinforce how the audience can continue to be involved in solving this community problem.
- Encourage participants to share their experience with others.

EVENT DAY

- Divide the session into sections: introduction; screening of video resources; follow-up discussion; closing.
- Establish an atmosphere of respect for everyone's thoughts, opinions and concerns.

Discussion Questions

These suggested questions can be addressed to water industry, governmental, or other local experts, as well as to the audience.

Local Issues

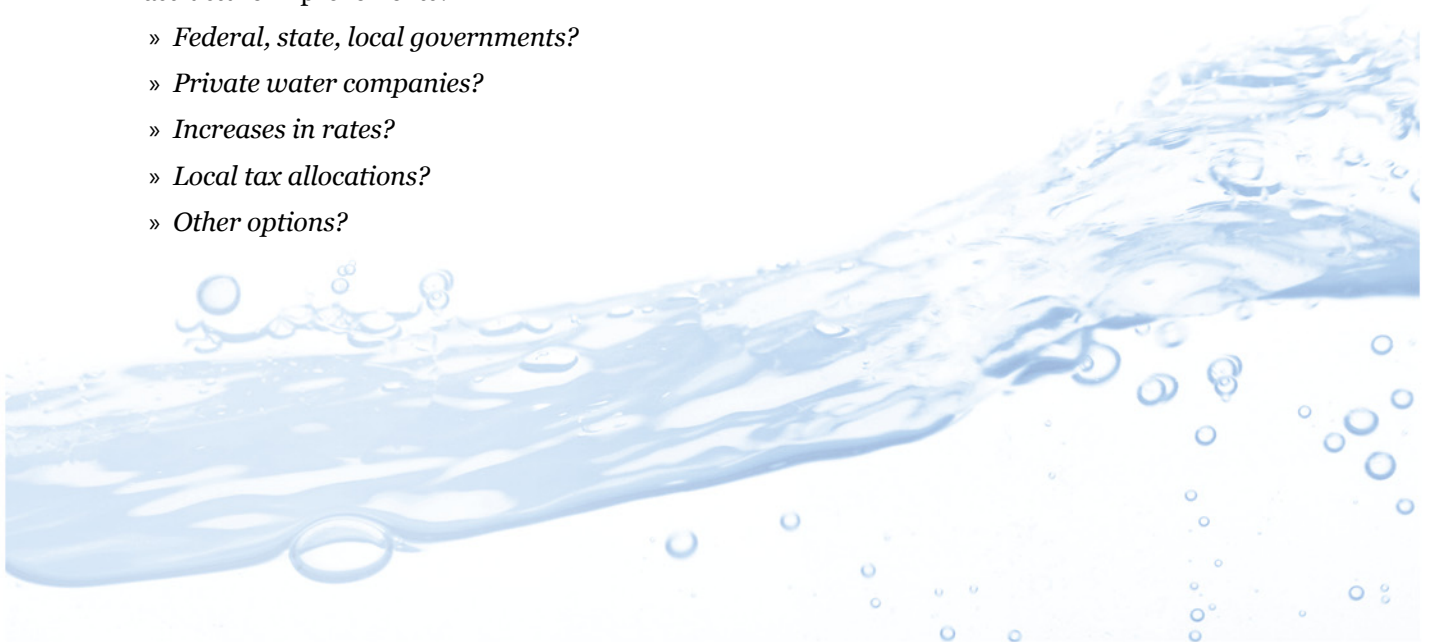
- What issues in the documentary are similar to the issues in your community?
- What are the public health or safety issues that can affect your community as a result of problems with the water infrastructure?
- Has your local economy been affected by shortfalls in your water infrastructure?
- How will increases in the rate structure be received by consumers?

Infrastructure Maintenance and Repair

- Who is responsible for sustaining your community's water resources? What questions would you like to ask them?
- What is your local watershed? What steps are being taken to protect it? What other communities share this watershed?
- Have the local water systems been inspected?
- When will the water systems in your community need to be replaced?
- Does your community have a plan to rehabilitate and repair its water infrastructure?
- How will your community pay for infrastructure improvements?
 - » *Federal, state, local governments?*
 - » *Private water companies?*
 - » *Increases in rates?*
 - » *Local tax allocations?*
 - » *Other options?*

Community Problem Solving

- What do you believe is the most pressing water issue in your community?
- What can be done on the local level to solve the community challenges?
- What individuals and groups need to come together to achieve results?
- What is the first step in bringing these groups together?
- How can communities in the same watershed share their ideas?



VIDEO RESOURCES

The *Liquid Assets* DVD consists of the following videos:

Preview

Approximately 4 minutes

The preview introduces audiences to U.S. water infrastructure and why it is an important topic to understand and discuss.

Overview

Approximately 16 minutes

The overview is a rapid-fire summary of the main ideas covered in the documentary. For people who have already seen the documentary, the overview serves as a refresher. For people who have not seen the documentary, it serves as a brief introduction to the key issues surrounding water infrastructure.

Documentary

Approximately 90 minutes

The full-length documentary explores the history, engineering, and political and economic challenges of U.S. water infrastructure through the stories of cities and towns that are struggling with these issues.

Note: The documentary is divided into chapters so that viewers can select the specific segments that are most relevant to their local water infrastructure issues.

Purchase *Liquid Assets*

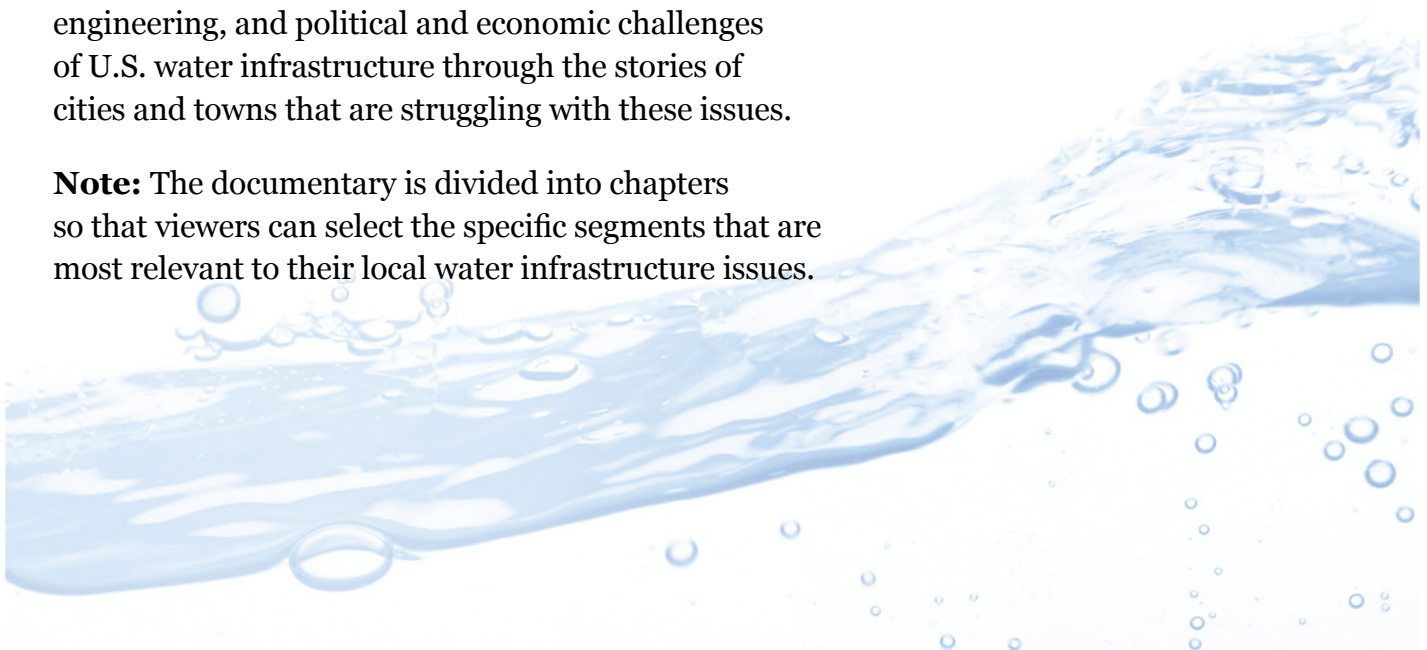
Starting October 1, 2008, the *Liquid Assets* DVD can be purchased from

Penn State

Public Broadcasting

Media Sales

(www.mediasales.psu.edu).



CHAPTER SUMMARY

How to Use the Chapter Summary

The chapter summary is a companion piece to the *Liquid Assets* documentary. Read through the chapter summary to review the entire documentary or to locate the content that best relates to local community issues.

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Overview of Documentary

Liquid Assets: The Story of Our Water Infrastructure tells the story of essential infrastructure systems: drinking water, wastewater, and stormwater. Exploring the history, engineering challenges, and political and economic realities, the documentary provides an understanding of the hidden assets that support every aspect of American life.

Chapter 1

Introduction

(Approx. 3.5 min.)

Cities and towns across America rely on one basic resource—water. Modern civilization and life itself would be impossible without it. There are more than 300 million people in America and each individual uses an average of 100 gallons of water daily. Water infrastructure is vital for disease and fire protection, basic sanitation, economic development and quality of life. Largely out of sight, out of mind, water infrastructure is aging and needs immediate attention at the local and national level.

Chapter 2

Three Systems: Drinking Water, Wastewater, and Stormwater

(Approx. 13 min.)

Water infrastructure consists of three complex and interconnected systems. One system cleans and delivers drinking water; another collects, treats, and reintroduces wastewater back into the watershed; and the third (that is sometimes combined with the wastewater system) transports stormwater.

Drinking Water

Every community's safe drinking water relies on having a clean watershed—an area of land where water from rain or snowmelt drains downhill into a body of water. Eighteenth-century Philadelphia was home to the first water delivery system in America. Because of Philadelphia's growing population, its groundwater was polluted and not potable (not clean enough for drinking), so the city developed technologies to pump drinking water from the nearby Schuylkill River. For New York City, drinking water is collected and stored in 19 reservoirs in upstate New York and fed by gravity through an 85-five-mile-long aqueduct—a monumental task.

Wastewater

Once water is used, it contains pollutants that must be removed and treated before release. Historically, Americans counted on its streams, rivers, and even the ocean to dilute and carry away their waste. In the nineteenth century, Boston built the country's first modern sewer system, which pumped sewage into Boston Harbor to drift out to sea. But by the twentieth century, dilution was no longer a viable approach, and new methods were needed for treating the huge volumes of waste generated by a growing city. Today, throughout the country, multimillion-dollar wastewater treatment plants clean wastewater by removing solids, settling out microscopic particles, decomposing toxic materials, and disinfecting. When effluent (treated wastewater) is released back into the watershed, it combines with other waters that eventually flow into the intakes of drinking water treatment plants and back to the faucets in households and businesses. It is an endless hydrologic cycle.

Stormwater

Communities must also manage rainwater to minimize flooding. Because concrete and other impervious surfaces prevent water from naturally soaking into the land, American cities engineered ways to transport stormwater away from population centers. In a combined system, wastewater and stormwater travel through the same pipes. When overloaded, these systems were designed to overflow directly into our waterways. Separate systems, on the other hand, use different pipes for wastewater and stormwater, but because rainwater captures trash and chemicals from the streets and deposits these into the stormwater pipes, pollution still travels directly to our waterways.

Chapter 3

The National Problem

(Approx. 4 min.)

Aging or inadequate infrastructure can negatively impact every aspect of life—from public health, to fire safety, to the vitality of the economy.

The nation's millions of miles of aging pipes—some 100 years old or more—need rehabilitation and repair. **The Washington Suburban Sanitary Commission** typifies the challenges of leaking pipes and water main breaks.

Chapter 4

The Value of Water

(Approx. 7 min.)

Public Health

The public relies on water infrastructure to deliver safe drinking water. Filtration, chlorination, and ozonation are used to protect the public from waterborne diseases. Breakdowns can cause severe public health consequences, such as the one that occurred in 1993 in Milwaukee, where a cryptosporidium outbreak resulted in an estimated 400,000 individuals becoming sick. Communities must constantly monitor and upgrade water systems in response to new challenges.

Safety

The District of Columbia typifies the importance of maintaining water delivery systems for fire protection. Aging pipes accumulate buildup, choking off the water supplies and preventing the proper water pressure necessary for fighting fires and saving lives.

Economy

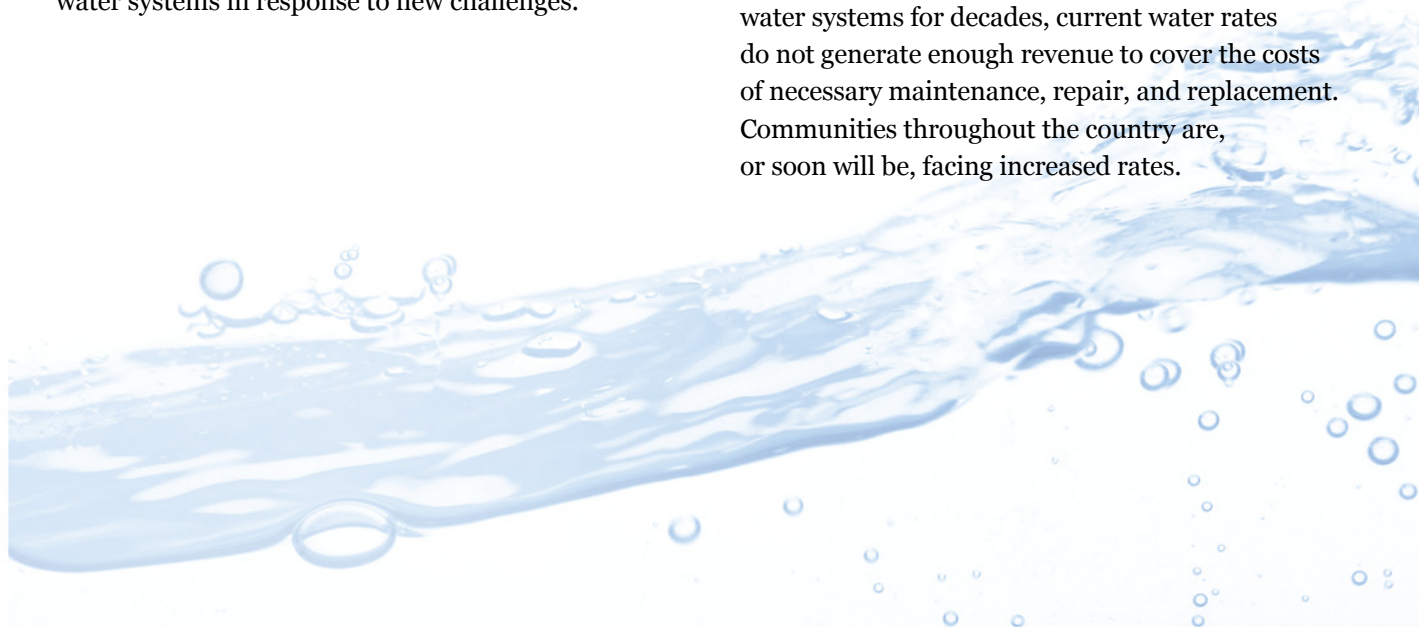
An estimated 80 percent of America's water usage comes from agriculture and industry. Clean water is critical for high-tech manufacturing, hospitals, and agricultural irrigation—and with these economic drivers come jobs. Cities that cannot offer adequate water supplies will see their economic base suffer.

Chapter 5

The Funding Gap

(Approx. 2 min.)

The **Environmental Protection Agency** estimates that there is a \$540 billion difference between what the nation is currently spending on the water infrastructure and the actual investment requirements for maintaining and renewing the infrastructure over the next 20 years. In the U.S., on average, families pay less than 1 percent of their income for tap water. Experts representing water utilities explain that because communities have neglected water systems for decades, current water rates do not generate enough revenue to cover the costs of necessary maintenance, repair, and replacement. Communities throughout the country are, or soon will be, facing increased rates.



Chapter 6

New York City: System Complexity & Watershed Protection

(Approx. 6 min.)

Managing and maintaining water infrastructure is an enormously complex task. New York City's infrastructure is truly an engineering marvel, but one that faces continual challenges. Two massive concrete-lined underground tunnels built in the early twentieth century—known as Tunnel 1 and Tunnel 2—deliver the city's water supply. No one knows their current condition, because rusted valves have prevented shutdowns for tunnel inspections. New York City's "sandhogs," underground construction workers, have been working on a third tunnel for 40 years. When completed in 2012, Tunnel 3 will provide redundancies for a safer water system, along with the opportunity to shut down Tunnel 1 for rehabilitation.

Watershed Protection Approach

New York City's water infrastructure planning does not stop with tunnel construction. The city must also protect and maintain the upstate reservoirs that supply its water, and it has purchased tracts of land adjacent to the reservoirs to prevent development. New York City was one of the first to adopt a watershed protection approach. It can be easier and less expensive to prevent pollution at the source through protection efforts than to treat the water later.

Chapter 7

Federal Regulations

(Approx. 2 min.)

Federal regulations help protect water. The Clean Water Act regulates the discharge of pollutants into surface waters, and the Safe Drinking Water Act provides standards for potable water. The chairman of the **U.S. Congressional Committee on Transportation and Infrastructure** explains that currently 50 percent of the nation's waters are swimmable, double the

number in 1972 when the Clean Water Act was passed. Grants from the Clean Water Act helped to build and upgrade wastewater treatment plants across the country and make the difference for our waterways, but in the 1980s funding diminished, and upgrades slowed.

Chapter 8

Pittsburgh: Watershed Politics

(Approx. 7.5 min.)

A watershed usually spreads across town and state borders, so different communities must come together to protect their common interests. Pittsburgh relies on three converging rivers (the Allegheny, Monongahela, and Ohio rivers) for industry, recreation, and drinking water. Yet Pittsburgh has combined sewer overflows (CSOs)—a condition when sewage and stormwater combine and pour solid waste directly into the rivers. Facing a consent decree and stiff fines, the city must reduce pollution levels and put a stop to the CSOs. **Allegheny County Sanitation Authority** (ALCOSAN), the region's wastewater treatment plant, serves 83 separate and distinct cities and towns, so continued plans for watershed protection will require communication, coordination, and collaboration.

Nine Mile Run

In a community-driven watershed cleanup in the middle of urban Pittsburgh, residents are seeing environmental benefits from their collaborative efforts. The Nine Mile Run project has had a significant impact and offers a promising example for others. To restore the creek, the community used sustainable methods—introducing a larger flood plain and native plants—to allow the land to naturally filter and clean sewage overflows before they enter the river. Organizers also aim to install 4,000 rain barrels in the community to collect rainwater from roof gutter downspouts, holding it within the watershed, and thereby reducing the amount and speed of flow that goes into the combined sewer lines.

Chapter 9

Herminie, Pennsylvania: A Small-Town Struggle

(Approx. 6.5 min.)

The struggle to fund water infrastructure improvements is as great in small towns as it is in metropolitan areas. With a population of 856 people, Herminie is a rural farming community in Pennsylvania that has been awaiting a wastewater treatment plant for more than 40 years.

As unbelievable as it is to see in an American town in the twenty-first century, wastewater flows in the street, down the mine shafts and directly into the creek, threatening public health and creating a stench on hot summer days. Without grant money, Herminie found its sewage rates would be too high for the community's income levels. Sewickley Township, home of Herminie, created a sewer authority board in 1998, but it took a decade to finally receive the necessary \$15 million in grant and loan funding, in this case from the **U.S. Department of Agriculture Rural Development office**.

Chapter 10

Los Angeles: Protecting the Beaches

(Approx. 7 min.)

Water infrastructure solutions from the past can cause unexpected consequences in the present. In the 1930s, faced with flooding and growing development, the city converted the Los Angeles river to a concrete flood-control channel to send street runoff and water overflows more quickly to sea. Replicating this system throughout Southern California enabled the region to build new homes and businesses without the need for large flood plains to absorb stormwater.

However, the region's flood-control channels inadvertently created pathways—big “water slides”—for waste and trash to travel unfiltered to its beaches. City workers must now vacuum out the stormwater system with giant machines, and signs remind residents that the storm drains on their street carry whatever they might dump there, from soapy water to oil, directly to the ocean.

In Santa Monica, the dry-weather runoff from its residents washing cars, cleaning streets, and irrigating plants and lawns generates enormous amounts of pollution, and the city built the **Santa Monica Urban Runoff Recycling Facility (SMURFF)**, a treatment plant, specifically for processing and recycling urban runoff.

The **Surfrider Foundation** is working to clean up Doheni Beach in Orange County, which it calls the dirtiest beach in Southern California, along with the San Juan Creek, a concrete flood channel flowing directly into the beach.

Once of interest only to activists, water quality is now the concern of every Southern California community. To reduce the strain on the entire watershed system, some communities are working to restore portions of man-made infrastructure to natural systems, in order to filter pollutants and slow their swift drainage to the sea.

Chapter 11

Las Vegas: Sustaining Water Resources

(Approx. 6 min.)

Communities realize that they must improve their water conservation and sustainability, whether they have aging infrastructure that squanders a seemingly plentiful water supply, or whether they are situated in a desert, where water is already scarce. Las Vegas lies in the Mojave Desert, and it is one of the fastest growing areas in the country. Every drop of water counts. While the Las Vegas Strip uses only 3 percent of all the water that the district delivers, 70 percent of the water in the region is used for residential landscape and golf course irrigation. To reduce usage, community planners now encourage people to design landscapes with native desert plants and to install artificial turf. Southern Nevada recycles all of its wastewater after treatment, either reintroducing it into the Colorado River, or using it for golf courses and parks. Las Vegas works hard to diminish water loss, and the district's efficiency rating—the comparison between water coming in and going out of the system—is considered one of the best in the nation. Computerized maps, which are linked to leakage detection units in the distribution system, enable the district to pinpoint and repair leaks when they first form, before they become a larger problem.

Chapter 12

Asset Management

(Approx. 3 min.)

To sustain water resources, communities practice “asset management,” a planning process to maintain and manage existing and future infrastructure. It would be impossible to dig up everything that is already in place all at once, and it is not usually necessary to do so; therefore, communities must make long-term plans for repair, renewal, and rehabilitation. Communities employ a variety of methods to gather data on the infrastructure. Robots travel underground through the pipes, taking video to identify cracks and other defects, which can also be detected by remote sensors. Technicians even travel on bikes through larger pipelines to perform visual inspections. After determining needs, the community prioritizes them, chooses rehabilitation techniques, determines the best timing and pursues funding strategies.

Chapter 13

Finding the Funds

(Approx. 4 min.)

Opinions vary on how to close what experts refer to as the funding gap. Many encourage the federal government to restore a construction grant program and induce local and state investment. Others look to local solutions to lower costs and increase efficiencies. Approximately 10 percent of all the water and wastewater systems in the country, especially those in small to mid-sized communities that have fewer resources than large cities, have engaged private companies to manage their assets. Whatever the solutions, all the experts agree that local water rates will inevitably need to rise in order to pay for essential needs. Breaking this news to their communities presents a significant challenge for elected officials.

Chapter 14

Atlanta: Leadership Drives Change

(Approx. 11 min.)

Atlanta offers promising solutions in the face of many challenges: an old infrastructure, outdated facilities, combined sewer overflows, and a severe lack of funding. In 1994 the **Upper Chattahoochee Riverkeeper** filed a Clean Water Act lawsuit resulting in consent decrees to make infrastructure improvements. Taking on the infrastructure challenge, **Mayor Shirley Franklin** has named herself the “Sewer Mayor” to highlight urgent needs for rehabilitation. Out of necessity and the informed consensus of the electorate, Atlanta’s water rates are among the highest in America, but with 25 percent of its population at or below the poverty line, the city tiers its rate structures. The city pursues a comprehensive asset management plan and deploys the latest technologies for sewer inspection and rehabilitation. Smoke testing and closed-circuit television help workers identify problems in the pipelines. Trenchless technology enables workers to replace pipes from one entry pit, versus digging a huge trench, saving time and money. And the city is constructing an 8-mile-long storage tunnel to decrease combined sewer overflows. Atlanta has committed to investing billions of dollars to rehabilitate the water infrastructure over the next decade to meet the promise of a high quality of life for all of its citizens, present and future.

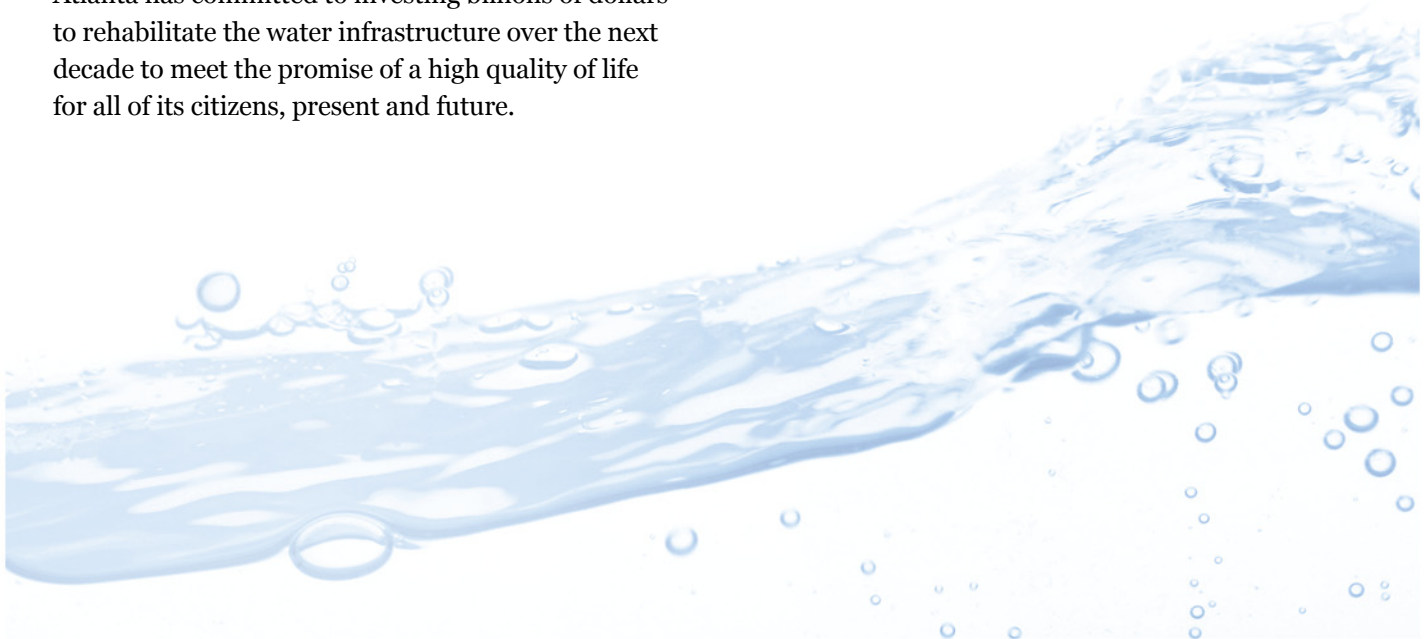
Chapter 15

Conclusion *(Approx. 2 min.)*

Whether forward-looking or in response to immediate concerns, cities and towns across America are addressing significant challenges and working to maintain and improve the water infrastructure. Their efforts are imperative to protect and sustain our nation’s most precious resource—water.

Chapter 16

Credits *(Approx. 2 min.)*



GLOSSARY

This glossary provides viewers with a basic understanding of some of the terminology used in the documentary.

ALCOSAN (Allegheny County Sanitary Authority)- the treatment plant responsible for the collection, transportation, treatment, and disposal of sewage for Pittsburgh, 82 neighboring municipalities in Allegheny County, and parts of communities in Washington and Westmoreland Counties

Asset management- a planning process to ensure that communities have the financial resources to inspect, rehabilitate, and replace water infrastructure. Asset management helps reduce costs while increasing the efficiency and the reliability of the assets.

Black water- domestic wastewater containing human waste

Bond levy- a loan or debt security used for funding municipal capital improvement projects

Centers for Disease Control and Prevention (CDC)- a division of the U.S. Department of Health and Human Services, the primary federal agency for conducting and supporting public health activities

Chlorination- water disinfection by chlorine gas or hypochlorite

Clean Water Act- the common term for the Federal Water Pollution Control Act of 1972 (with amendments passed in 1977, 1981, 1987, and 1994) which sets standards for the “chemical, physical, and biological integrity of the nation’s waters”

Closed-circuit TV- the technology used to survey pipelines and visually identify points of weakness

Combined Sewer Overflow (CSO)- an event that occurs when stormwater mixed with untreated wastewater from a combined sewer system overflows directly into local waterways. CSOs generally occur during wet weather (rainfall or snowmelt).

Combined Sewer Overflow (CSO) storage tunnel- a large underground tunnel that captures and stores sewage used to prevent Combined Sewer Overflows

Combined system- the infrastructure in which wastewater and stormwater travel through the same pipes. During a rain event, treatment plants may reach capacity, and the excess flow is diverted into local waterways, creating a Combined Sewer Overflow.

Concrete rivers- a concrete, man-made river designed to alleviate flooding and increase land development. While they prevent flooding by transporting water to the ocean at a faster rate than natural rivers, they often carry pollution from the urban environment.

Consent Decree- a legal agreement between a municipality and the federal government to cease illegal activity within a strict timeframe. Many communities are under consent decrees to address Combined Sewer Overflows.

Conservation- the careful use of water to ensure the quantity of the source supply

Cryptosporidium- a parasite found in lakes and rivers that causes illness and is highly resistant to disinfection

Cured-in-place lining- a trenchless technology for pipe rehabilitation in which a soft pipe is inverted into an existing pipe and hardened on site into a plastic liner

Dilution- a method of diminishing the strength of pollution by discharging it into a stream or other body of water

Distribution system- the system for carrying water to and from communities and industries, including treatment plants, pump stations, and pipe networks

Drinking water- the water that is of sufficient quality for human consumption, also termed potable water

Drought-tolerant ordinance- a regulation to conserve water with the use of drought-tolerant plants in the landscaping of residential and commercial properties

Dry-weather runoff- the waste water (not associated with wet weather conditions) that enters the stormwater infrastructure, often polluting the local waterways. It is a result of washing cars in the street and hosing down sidewalks, as well as the overspray from irrigation systems.

Effluent- the treated output of a wastewater treatment plant that is discharged into the nearest waterway

Environmental Protection Agency (EPA)- the U.S. agency responsible for efforts to control air and water pollution, radiation and pesticide hazards, ecological research, and solid waste disposal

Filtration- a purification process by which suspended solids and bacteria are removed from water

Floodplain- a low, flat area on either side of a river that can accommodate large amounts of water during a flood, lessening flood damage further downstream. The plants and grasses of the floodplain naturally filter out pollutants from the water.

Funding gap- the projected disparity between the actual cost of providing and maintaining water distribution services and the money that is received from sources such as government grants and loans and the revenue generated from customers

Gastroenteritis- an inflammation of the stomach and intestine resulting in severe illness

Grant vs. loan- A grant is money given to a municipality by a governmental group or other organization to aid in the completion of a project; there is no expectation of repayment. A loan is money borrowed from a funding organization, such as a bank; the organization expects to be repaid.

Grey water- the domestic water (dishwashing, laundry, and bathing water) that does not contain human waste

Groundwater- the water stored in usable amounts in layers of permeable soil and rock below the earth's surface

Impervious surface- a material through which water cannot pass, such as certain types of concrete

Meter- a device used to measure water consumption at residential and commercial venues

Municipality- a political unit, such as a city or town, incorporated for local self-government

Ozonation- the application of ozone to water for disinfection or for taste and odor control

Pathogen- a disease-causing organism

Pipe bursting- a trenchless technology for pipe replacement. A high-powered tool shatters the existing pipe as it pulls through a new pipe. It can be used to increase the diameter of a pipe.

Pipe rehabilitation- the process of restoring pipes

Potable water- See "drinking water".

Privatization- the process of transferring ownership of water resources from the public sector (government) to the private sector (business)

Public health- a societal effort to protect people from disease

Public-private partnerships- the services or ventures funded and operated through a partnership of government and one or more private sector companies

Public safety- a societal effort to prevent and protect the public, such as community fire protection

Rain gutter downspout- a device connected to the roof of a building that collects water from precipitation and drains the water away from the building

Rate hike- an increase in the cost of water services

Rate structure- the organization of billing charges based on the consumers' usage and the per unit cost of providing that service. This may include tiered rates based on socio-economic factors.

Rates- the price charged to the consumer by the utility for water services

Reclaimed water- See "recycled water".

Recycled water- the wastewater that has been treated and purified for reuse in agricultural and industrial applications rather than for discharge into a body of water. Also see "reuse".

Reservoir- a natural or artificial lake where source water is collected and stored

Reuse- a conservation technique to preserve the water source supply in which wastewater and stormwater are treated for agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing a groundwater basin

Robot- a mechanical device used to inspect and sometimes repair water infrastructure

Safe Drinking Water Act- a regulation passed by the U.S. Congress in 1974 to help ensure safe drinking water in the U.S., setting maximum contaminant levels for a variety of chemicals, metals, and bacteria in public water supplies

Sandhogs- the members of New York City's Local 147, the Tunnel Workers Union, who construct water tunnels, sewers, highway tunnels, and subways

Sanitary Sewer Overflows (SSOs)- the untreated or partially treated sewage overflows from a separate sanitary sewer collection system. This is different from the Combined Sewer Overflows (CSOs), that occur as a result of a combined sewer system.

Sewage- the used water and solids that flow from homes and businesses through the wastewater infrastructure to a wastewater treatment plant

Sewer- an underground system of pipes used to carry wastewater

SMURRF (Santa Monica Urban Runoff Recycling Facility)- the treatment facility for dry-weather runoff that provides reused water to the community in Santa Monica, California

Stormwater- the water that accumulates from precipitation and runoff from land, pavement, building rooftops and other surfaces

Stream restoration- an effort to repair a stream after it has been damaged by urban runoff, Combined Sewer Overflows, and erosion

Streptococcus- a bacteria that causes serious illness in humans

Subtropical plants- the vegetation that is not suitable for desert landscapes, but rather is indigenous to environments where there is abundant rainfall

Sustainability- the ability to maintain and preserve water infrastructure and the water supply to meet the needs of current and future generations

Treatment plant- a facility for cleaning and treating water to make it suitable for drinking; a wastewater treatment plant cleans and treats wastewater before discharge into a water body.

Trenchless technology- a construction and pipe-replacement technique that uses an entry pit to reduce the need for surface excavation and can often decrease costs associated with underground work

True-value pricing or full-cost pricing- the integration of all costs associated with water services into the water rate paid by people and businesses

Tuberculin- the buildup inside of a pipe that narrows the passageway over time and reduces the pipe's capacity to transport water

Tunnel 3- a massive underground tunnel that will provide a critical third connection to New York City's water supply system

Utility- a public or private entity that provides water services and is subject to government regulation

Valve- a device that regulates the flow of water through pipes by opening and closing passageways

Wastewater- the used water and solids from homes and businesses that require treatment before reuse or discharge into waterways

Water-efficient landscaping- the use of drought-resistant vegetation and efficient irrigation to reduce water consumption

Water infrastructure- the integrated, engineered elements for distributing drinking water, wastewater and stormwater, such as pipes, pumping stations, treatment plants

Water loss- the escape of water from pipe networks due to cracks and leaks

Water main- a primary pipe in the water distribution system

Waterborne disease- any illness spread by contaminated water, such as cryptosporidium

Watershed- an area of land where water from rain or snowmelt drains downhill into a body of water—streams, rivers, lakes and oceans

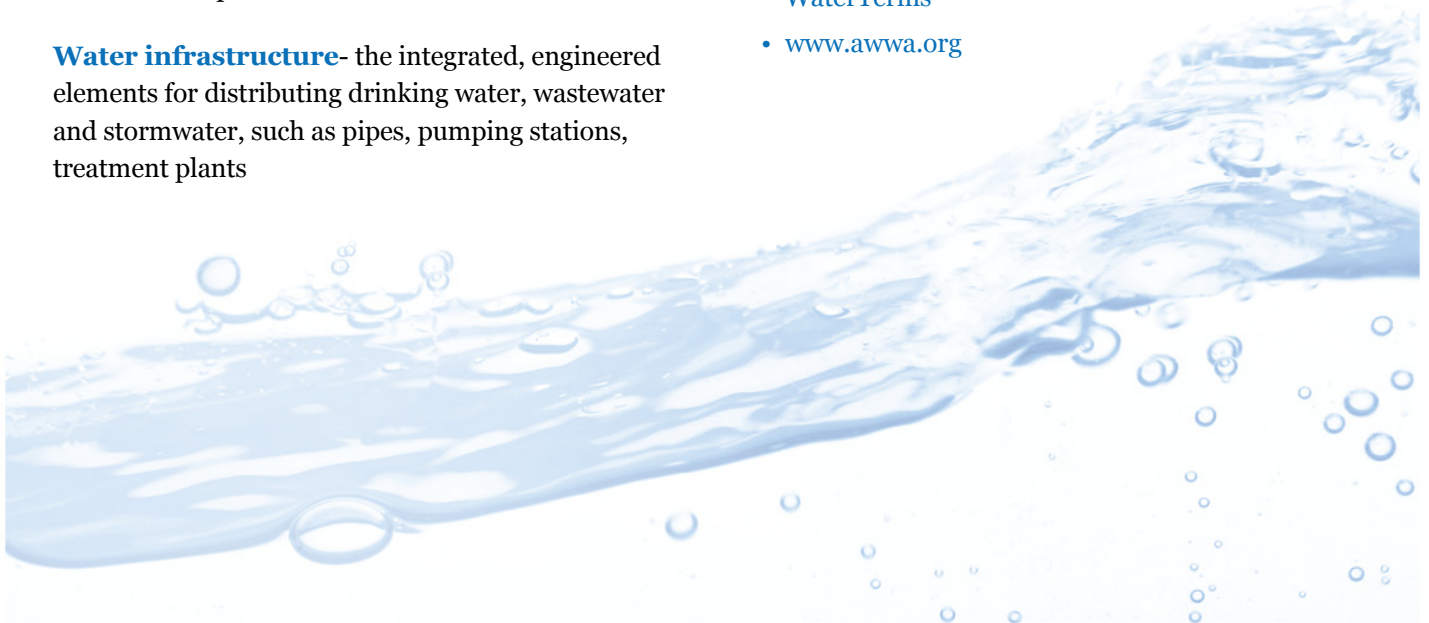
Watershed protection- an effort to secure a water supply at its source through various collaborative methods such as water quality monitoring, land buy-back, and community pollution reduction

Sources of definitions:

The definitions are based on the experts' interviews in the documentary.

These online sources provided additional information:

- www.epa.gov/safewater/pubs/gloss2.html
- www.cdc.gov
- www.nesc.wvu.edu
- www.wef.org/AboutWater/ForThePublic/WaterTerms
- www.awwa.org



FREQUENTLY ASKED QUESTIONS

The Documentary

What is *Liquid Assets*?

Liquid Assets is a public media and outreach initiative to inform the nation about the critical role our water infrastructure plays in protecting health and promoting economic prosperity. Combining a 90-minute documentary with a Community Toolkit for facilitating local involvement, *Liquid Assets* explores the history, engineering, political, and economic challenges of our water infrastructure, and engages communities in local discussions about public water and wastewater issues.

Who produced *Liquid Assets*?

Liquid Assets is a production of **Penn State Public Broadcasting** (wpsu.org), which is solely responsible for its content.

What is a public media and outreach initiative?

A public media and outreach initiative combines a public television broadcast, with a robust educational outreach effort to help encourage local discussion. A public media and outreach initiative helps to raise public awareness of important and timely issues that impact people at both the national and local levels.

The initiative helps build partnerships and provides materials to professional and civic organizations, public broadcasting stations, and others to help them organize community discussions about the issue.

Penn State Public Broadcasting's public media and outreach initiatives are strengthened through the academic resources of **Penn State**.

What are the themes of the documentary?

- Drinking Water, Wastewater, and Stormwater
- Public Health, Public Safety
- Complexity of Systems
- Watershed Protection
- 21st- Century Solutions
- The Funding Challenge

What locations are featured in the documentary?

Boston; Philadelphia; Milwaukee; Washington, D.C.; New York City; Pittsburgh; Herminie, Pennsylvania; Los Angeles; Las Vegas; and Atlanta

Is *Liquid Assets* offered in Spanish?

We regret that at this time we are unable to provide the documentary or the Community Toolkit in a Spanish-language version. However, if funding allows, we would welcome the opportunity to provide these in Spanish at a later date. We will update the information on the Web site if this becomes possible.

Public Television Broadcast

When will the documentary be broadcast?

On October 1, 2008, the documentary will be released to public television stations for broadcast.

The decision to air the documentary rests solely with individual stations. They will have the rights to repeat broadcasts of the documentary for up to three years. Check with your local public television station for local broadcast times.

How can I locate my local public television station?

To find your local station, visit the **National Center for Outreach (NCO)** Web site:

www.nationaloutreach.org/stationinfo/stationDirectory/index.cfm.

How can I help to encourage my local public television station to air the documentary?

Stations usually welcome friendly calls of interest from their communities. When you call your station, a good place to begin is to ask for the station programmer.

Introduce yourself. Mention that you are calling about a documentary that the station may be interested in airing. Invite your station to visit

www.liquidassets.psu.edu for details.

Is it possible to partner with my local station to hold a community meeting?

If you represent a community group and are open to discussing ideas and sharing resources, and if your station's scheduling permits it, the station will likely be receptive to collaborating on local activities that will serve the community. When you call, begin by saying, "My organization would be very interested in partnering with you to do an outreach activity to facilitate local discussion surrounding the *Liquid Assets* broadcast." Your organization might also want to offer to help sponsor the collaborative event or to underwrite the local broadcast.

Can the documentary be broadcast on a local cable access station?

No, the documentary broadcast rights are exclusive to public television stations. However, if the cable-access station is a nonprofit, it would be permissible to show brief sections of video as part of a filmed public meeting. In addition, if your local public television station operates its own noncommercial cable channel, it will have the rights to present the program on that channel.

Community Meetings

What resources are available for community meetings?

Our Community Toolkit helps to make it easier for you to hold an event or facilitate dialogue with local leaders about water infrastructure issues.

Visit www.liquidassets.psu.edu to access these materials.

Is there a DVD that I can show at a meeting?

Yes. The DVD includes the full-length documentary, chapters, a four-minute preview, and a 16-minute overview to show at meetings.

Where can I get the DVD?

On October 1, 2008, the DVD will go on sale through **Penn State Public Broadcasting Media Sales** (www.mediasales.psu.edu).

K-12 and College Education

Are there any materials for schools?

Classroom materials tied to national educational standards are being developed and when completed will be found at www.liquidassets.psu.edu.

Please check back. In the meantime, the documentary and accompanying videos, all G-rated, are suitable to share in school settings. Educators may want to garner ideas from the chapter summaries and the glossary in the Community Toolkit. Also, teachers may find other helpful environmentally related educational materials on the Web site of Penn State Public Broadcasting's Educational Services: www.wpsu.org/education.