Source Water Protection Justification

TOOLKIT

American Water Works Association

Dedicated to the World's Most Important Resource®

Contents

1. Executive Summary

Source water protection is the mitigation of potential risks and impacts to drinking water supplies. It is one of the first critical barriers against drinking water contamination and other risks to drinking water supplies. A strong source water protection program can be one of the most cost-effective methods for maintaining, safeguarding, and improving source water—and drinking water—quality and quantity.

Program effectiveness relies on a clear and effective strategy; broad technical, financial, and political support; targeted education and outreach; sustained funding; and committed and engaged champions.

This toolkit is intended for drinking water systems of all sizes. It provides information for systems looking to implement source water protection measures for the first time and systems that want to modify or expand existing source water protection programs. For water systems that are at the early stages of considering or implementing source water protection, the toolkit provides background on the approaches, benefits, and challenges to source water protection. For water systems that want to expand source water protection activities, the toolkit offers approaches and tools for articulating and communicating the value and benefits of source water protection.

2. Introduction

Toolkit purpose

This toolkit is intended for drinking water systems that are looking to implement source water protection activities for the first time or modifying or expanding existing source water protection programs. It is designed to help systems of all sizes capture and communicate the environmental, social, and financial benefits associated with source water protection activities.

The toolkit outlines:

- Traditional and emerging principles and practices for source water protection.
- Benefits of source water protection.
- Strategies to overcome common source water protection challenges.
- Approaches and tools to communicate the benefits of source water protection to key audiences, including public officials, water system boards, the public, industry, and more.
- Real world examples of source water protection successes.
- Links to resources for more information on the topics addressed.

Additional AWWA source water protection resources are available through AWWA's Source Water Protection Resource Community.

Getting started with the toolkit

This toolkit is for all drinking water systems, regardless of size, location, source water protection concerns, and experience. Use the following guidelines to determine the most relevant starting point for you.

If you are...	Consider starting at...
New to source water protection	The beginning of the toolkit
Familiar with source water protection, but new to building a source water protection program	Components of a Successful Source Water Protection Program
Experienced with source water protection programs, and looking to modify or expand existing source water protection activities	Overview of Approaches to Source Water Protection
Looking to build a robust business case for source water protection	Making the Business Case for Source Water Protection
Evaluating funding options to implement source water protection	Leadership and Funding Approaches

What is source water protection?

Source water is a raw, untreated supply of water – typically surface water or groundwater – used for current or potential future drinking water. **Source water protection** is a proactive approach to safeguard, maintain, or improve the quality and/or quantity of drinking water sources and their contributing areas. In addition to selecting a high-quality water supply, minimizing potential risks and impacts to the source is one of the first key steps in a multiple-barrier approach to providing clean drinking water.

Effective source water protection programs often address existing issues or concerns. They should also be forward-looking, to evaluate and address future challenges, and involve stakeholders throughout the planning and implementation process. **Stakeholders** include any group or individual interested in, affected by, or having an impact on source water protection activities. Stakeholders are diverse and vary based on local challenges faced in source water protection areas.

The ANSI/AWWA Standard G300, Source Water Protection and accompanying operational guidebook provide a framework to guide drinking water systems through developing and continuously evaluating a source water protection program.

What are the benefits of source water protection?

The goals, scope, and actions of a drinking water system's source water protection program will vary according to source quality, contamination threats and concerns, available resources, community involvement, and other factors. Source water protection can provide many benefits, including:

- Public health protection, through improved understanding and stewardship of the watershed, aquifer, and drinking water source(s)
- Improved source water quantity and quality
- Environmental stewardship and accountability
- Habitat and ecosystem services protection
- Enhanced aesthetic quality of the watershed, which can help increase property value in the community
- The potential for reduced treatment or contaminant management costs
- Social benefits from collaboration and partnership-building with local government, citizens, environmental groups, industry, and more
- Enhanced regulatory compliance, and opportunity for credits associated with compliance
- Improved long-term management of critical natural infrastructure, such as forests
- Improved preparedness and response capacity for emergency events
- More robust data on watershed and source water health, and greater opportunities for sharing valuable data with stakeholders and regulators
- A common understanding of the natural and human-made stresses and threats facing the watershed

Regulatory framework for source water protection

Federal requirements for source water protection requirements are limited in large part because local land use is an issue managed by local governments and land use policies. Therefore, state and local implementation of source water protection activities often depends heavily on voluntary initiatives. However, there are federal frameworks in place for source water assessments, water quality protection, and state management and oversight of source water protection activities.

Safe Drinking Water Act Amendments

The Safe Drinking Water Act (SDWA) was signed into law in 1974, four years after the U.S. Environmental Protection Agency (EPA) was established. The law was prompted in part by studies identifying significant problems with surface and ground water quality and the management of public water supplies, and the associated health risks. Under the SDWA, EPA is authorized to establish national health-based standards for naturally occurring or human-made drinking water contaminants.

The 1986 Amendments to the SDWA introduced requirements for source water protection of ground water. States were required to establish programs designed to protect areas around drinking water supply wells (Wellhead Protection Programs). The 1996 SDWA Amendments expanded the regulatory framework for source water protection, laying out a multiple barrier approach for drinking water and public health protection for ground water and surface water supplies. Under these new requirements, states were required to develop drinking water source water assessment programs (SWAPs). Source water assessment requirements included:

- Defining source water protection areas (SWPAs)
- Developing inventories of known and potential contamination sources
- Determining water system susceptibility to contaminant sources or activities within the SWPA
- Notifying the public about identified threats

There is no federal requirement to take the information from these assessments and implement local source water protection activities or programs. Many source water assessments developed in response to the 1996 requirements have not been routinely updated.

There are additional source water protection requirements under other federal programs and statutes. The Sole Source Aquifer Program requires additional federal review of certain federally funded projects with the potential to contaminate sole source aquifers. The Underground Injection Control (UIC) program protects current and future underground drinking water sources from contamination by subsurface fluid emplacement. The Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and Federal Insecticide, Fungicide, and Rodenticide act (FIFRA) also help to control potential pollutants and contaminants in source waters and watersheds.

Clean Water Act

The Clean Water Act (CWA) authorizes EPA and delegated states to regulate entities and activities that have the potential to contaminate surface water bodies, including:

- Point source pollution discharges, such as industrial operations or wastewater treatment facilities
- Non-point sources of pollution, such as urban runoff, or streambank erosion

EPA or authorized states and tribes set water quality standards (WQSs) for surface water bodies, and, through total maximum daily loads (TMDLs), establish the allowable levels of pollutants that can be discharged to surface water bodies that are not meeting WQSs.

Beyond EPA, other federal agencies play a role in ensuring the health of drinking water supplies. These agencies include the U.S. Department of Agriculture, U.S. Department of Interior, and U.S. Army Corps of Engineers, among others.

State and local roles and responsibility

In most cases, states are responsible for implementing the regulatory requirements that impact source water protection under the SDWA and CWA. States are also responsible for establishing initiatives to provide technical and financial assistance to drinking water systems pursuing source water protection activities.

States have used a range of approaches to implement source water protection requirements and programs. These include requiring regular updates of source water assessments and protection plans, mapping SWPAs, and initiating cross-program and -agency workgroups and other collaborative initiatives (ASDWA and GWPC, 2008). Some states give additional priority for federal funding, like Drinking Water State Revolving Fund loans, to communities or water systems implementing source water protection programs.

It is often local authorities, such as planning or zoning boards, health departments, or elected local officials who decide how land in and around source water protection areas can be used. In many cases, drinking water systems do not play a prominent role in these decisions (GWPC, 2007). However, water systems and local authorities can work together to protect source waters through measures such as (EPA, 2018):

- Targeted facility inspections, training, and public education
- Zoning restrictions or prohibitions on land use and population density in sensitive areas
- Construction and operations standards
- Regulation and permitting of activities that could endanger drinking water sources
- Land acquisition

If you are just beginning to consider source water protection activities, be sure to coordinate closely with your local and state government.

State Source Water Protection Initiatives

California's 2014 Sustainable Groundwater Management Act lays out a framework for Sustainable Groundwater Management Act. It emphasizes the importance of local entities in managing and maintaining groundwater resources. The Act requires responsible local entities and Groundwater Sustainability Agencies in medium and high priority basins to develop Groundwater Sustainability Plans and achieve sustainability within 20 years of the implementing the plan (California Department of Water Resources, 2018). The Act also emphasizes the proactive management of reduced ground water storage capacity, declining ground water levels, land subsidence, surface water depletion, water quality degradation, and salt water intrusion. California's Assembly Bill 2480, approved by the Governor in September 2016, recognizes and defines source watersheds as "integral components of California's water infrastructure." It also designates source watershed maintenance and repair as eligible for "the same forms of financing as other water collection and treatment infrastructure." (California Legislative Information, 2016)

Components of a successful local source water protection program

The AWWA Standard G300 outlines six key components of a successful local source water protection program (Figure 1).

- Develop a formalized source water protection vision. Water systems should be engaging with internal and external stakeholders to develop this vision and throughout the successive steps.
- Characterize and assess source water and the land or subsurface area from which it is derived. This will identify the most critical water quality and contamination concerns and inform program focus and priorities.
- Establish program goals and objectives to guide the overarching source water protection program and all program efforts. Goals should be prioritized and can capture current and future priorities and concerns. Goals should also be specific and measurable, to evaluate progress over time.
- Develop an action plan identifying the roadmap for implementation and specific activities and priorities for implementation. The plan should also include a timeline for program implementation, description of resources needed and associated sources, and metrics for evaluating the success of the plan.
- Implement the action plan.
- Periodically evaluate the plan, based on the metrics established, and modify as needed.

While "basic success in each area must be demonstrated in order for a utility to meet the criteria" of the standard, the scope and complexity of these components can vary greatly across water systems.

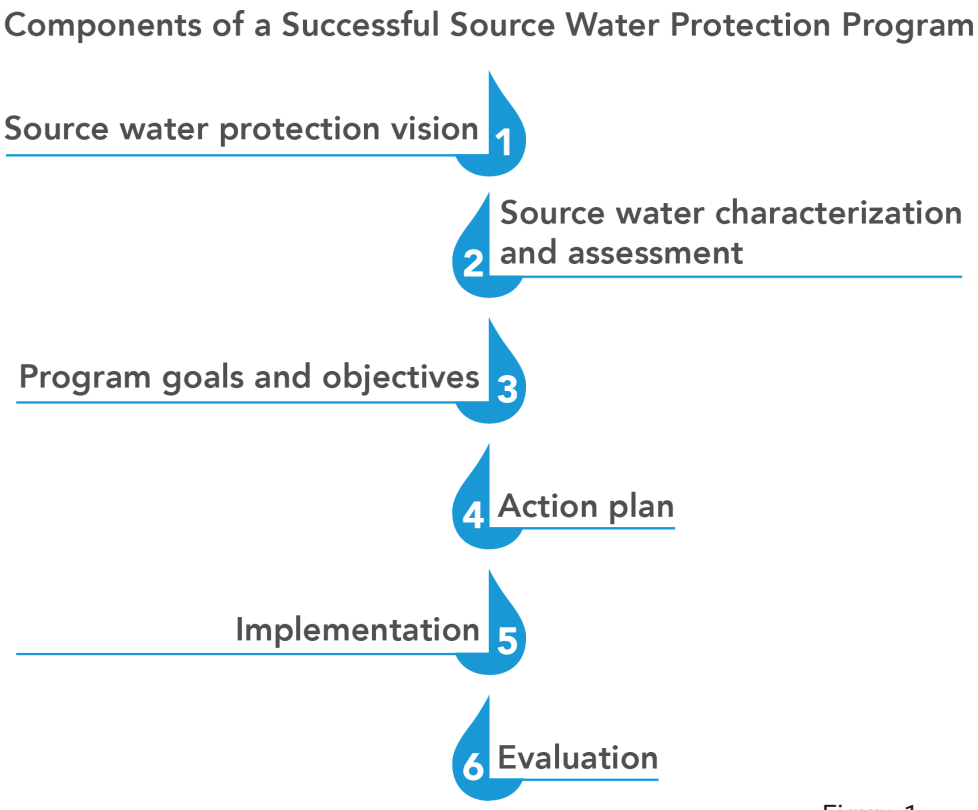

Figure 1

3. Overview of approaches to source water protection

Source water protection activities should target the priority threats to water quality and public health. When evaluating potential approaches, it is important to consider:

- Cost of implementation
- Timescale for implementation
- Technical complexity
- Associated legal restrictions
- Responsible parties for implementation
- Key stakeholders who will be affected by the activity

Successful source water protection will likely require a combination of activities. Examples of common activities are provided in Figure 2.

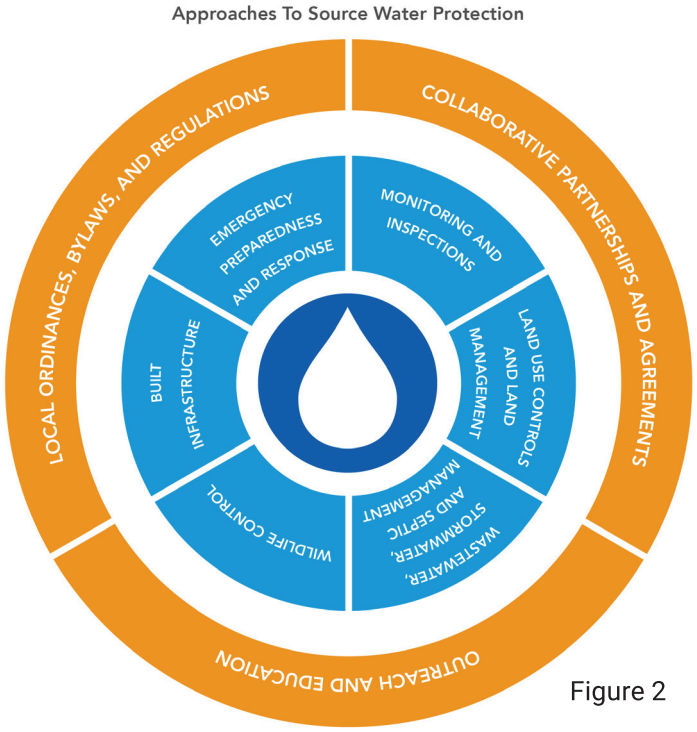

Figure 2

Monitoring and inspection

Conducting Geographic Information System (GIS) mapping, field surveys, or watershed and water quality monitoring. These activities can help a water system better understand the impacts of land use, pollution discharge, and other human and natural activities on water quality and identify and prioritize source lands (TPL, 2004).

- Developing or updating a contaminant inventory. The inventory should describe individual sources or categories of contamination within the watershed or aquifer recharge area.
- Monitoring and tracking contaminant sources, based on the contaminant inventory, over time.

Land use controls and land management

Better managing how land within or around the watershed or aquifer recharge area is used can have significant impacts on water quality. Management and control activities can be mandatory (in coordination with local governments) or voluntary. They can also be paired with financial incentives to encourage adoption of voluntary practices. Potential activities include:

- Working with landowners to implement responsible land and agricultural management practices. These practices may include integrated pest management, crop rotation, precision farming, animal grazing management, and lawn maintenance and landscaping practices that limit the amount of pesticides, fertilizers, and water needed (EPA, 2002). The U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Services (NRCS) provides significant technical and financial support for land management activities every year.
- Implementing measures targeted at controlling erosion and sediment loading, for example, through built infrastructure (described below), improved land management and stewardship, good housekeeping practices at construction sites (e.g., on-site vehicle washing and timing construction activities with periods of lower rainfall), and strategic planting of vegetation.
- Improving forestry management, including monitoring and maintaining forest roads, pre-harvest planning, establishing no-harvest zones, or reducing harvesting in riparian management zones, among other activities (American Rivers, 2013).
- Purchasing land or obtaining conservation easements near drinking water sources.

Wastewater, stormwater, and septic system management

CWA measures can limit pollutant discharges into source waters or connected waterbodies. Additional activities to improve wastewater, stormwater, and septic management can enhance the protection of drinking water sources. Example activities include:

- Implementing a septic system replacement incentive program, requiring septic tank and leachfield inspections and maintenance, and requiring minimum septic system setback distances from surface water sources.
- Improving stormwater management, including erosion and sediment controls through green or gray infrastructure, roadway/right-of-way maintenance, education, minimizing impervious areas, and enhancing siting and design measures for stormwater drainage tile systems and wells.
- Improving wastewater management and control measures, including the use of green infrastructure to remove pollutants in stormwater and improve infiltration.
- Enhancing wastewater treatment and management technologies for industrial dischargers.

Wildlife control

Wildlife and domestic pets can be the source of biological threats to public water supply safety (EPA, 2001). If permitted, control measures can include: initiatives to repel birds and wildlife from source waters such as decoys or habitat modifications; fencing, tree pruning, or other landscaping and vegetation changes; limiting food sources; and, initiating a pet waste management and disposal campaign.

Built Infrastructure

Green and gray infrastructure can accomplish many of the activities listed above, especially controlling pollution from point source and non-point sources. Examples of green infrastructure include constructed wetlands, streambank restoration measures, vegetative buffer strips, and detention and retention ponds. Examples of gray or constructed infrastructure and devices include drainage and treatment systems for wastewater disposal at industrial facilities, combined sewer overflow (CSO) technologies, and wet weather storage facilities. Built infrastructure can also help to improve the resiliency of source waters and the utility in the face of extreme events or other environmental changes.

Enhanced emergency preparedness and response

Implementing and enhancing existing emergency preparedness and response measures can help to avoid potentially serious drinking water source contamination events. These measures can also expedite water system and community recovery from a contamination or other emergency event. Examples include:

- Coordinating with local officials responsible for spill prevention and control measures.
- Establishing and documenting clear emergency response procedures for water system personnel, and a coordinated response network with other community responders (and neighboring water systems and emergency responders, as appropriate).
- Engaging with local, state, and federal partners to reduce wildfire risks within the watershed and surrounding community through fuel management, better use of data and technology, and public education, among other measures.

Collaborative partnerships and incentives

It is essential to build collaborative partnerships among the entities managing implementation and oversight and those impacted by the activities. Collaboration and partnership should be a priority from the earliest stages of evaluating priorities and potential activities, through implementation, oversight, and evaluation. The scope of and participants in a collaborative effort will vary depending on the specific activity. The partnership may be specific to a single source of pollution or it may be broader, across the entire watershed.
Incentives can be used to encourage buy-in. For example, the water system can reimburse homeowners, landowners, or business owners for design and installation of best management practices in sensitive areas, or transfer of land ownership and development rights.

Opportunities and approaches for source water protection partnerships with the agricultural community are detailed in AWWA's report on USDA Tools to Support Source Water Protection.

Stakeholder outreach and education

Dedicated outreach and education initiatives are critical for obtaining buy-in and participation. Outreach and education should target stakeholders directly affected by a source water protection activity and those who can serve as advocates for source water protection initiatives. Outreach and education should be tailored to communicate the most meaningful information, including the problem, the solution, the stakeholder's role, and the specific benefits to them and the broader community. The style, format, and language of these materials should be accessible to the audience. Key stakeholders may include the public, K through 12 students and educators, landowners, dischargers, municipal decision-makers, and environmental and industry advocacy groups, among others.

Local ordinances and bylaws; zoning and development regulations

Local regulatory approaches may be used to implement some of the initiatives described above. These approaches can include, but are not limited to, zoning ordinances or bylaws, construction and operating standards, development regulations, and required permitting or inspections (EPA, 2002). Specific examples include:

- Establishing a zoning overlay district, which is superimposed on an existing zoning district, to more closely manage activities that can affect surface or ground water quality (EPA, 2015).
- Using a transfer of development rights to separate development rights from vulnerable land parcels (e.g., where drinking water sources are located) and transfer them to a more appropriate site.
- Implementing secondary containment requirements for hazardous materials, aboveground storage tanks, and other potential sources of contamination.

Working with local planners who understand land use ordinances and zoning bylaws can help implement source water protection activities properly and smoothly.

4. Common challenges

The benefits of a source water protection program can be significant. However, drinking water systems and their source water protection partners must be prepared to encounter and address obstacles. The table below outlines common obstacles and example solutions.

Common Challenge	Example Solution
Resource limitations. Particularly for smaller water systems, finding the staff time and technical capacity to take on long-term responsibility for source water protection can be very difficult. Additionally, water systems may have difficulty finding sustained funding and may lack the capacity, resources, and equipment for data collection/analysis and building a complete scientific picture.	Start small. Implement one distinct activity at a time. Conserve resources until your staff and community better understand the planning and funding process and recognize the value of investing in source water protection.
Making a compelling case for investments in source water protection is best done through accurate and compelling quantification of benefits and outcomes. This can be complicated by the need to adequately demonstrate the costs and benefits from the perspectives of the drinking water system, public officials and board members, the public, those impacted by the proposed activities, and other key audiences.	Identify other water systems with similar source water and community profiles that have implemented complementary activities. Understand how they justified the investment, and what positive outcomes they have seen as a result. Build a case for parallel outcomes in your community.
Lack of jurisdiction over source water protection areas. This may limit the water system's authority to undertake source water protection activities.	Consider the viewpoint and motivations of the party that does have jurisdiction, e.g., a business owner or private landowner. Select activities that have mutually beneficial components and build a business case that clearly reflects their interests and priorities.
Inability to reach common agreement on the causes of source water pollution and the most appropriate measures for addressing those causes.	Apply a structured framework for evaluating and prioritizing risks to source water protection and selecting corresponding activities. Work with key stakeholders in advance to agree on the framework and process for applying it.

Common Challenge	Example Solution
Lack of knowledge among water system staff and key stakeholders on source water protection and associated costs and benefits.	Find opportunities to partner with other local water systems to share staff and financial resources and technical knowledge.
Competing and complex economic, environmental, and community priorities, and lack of consensus on how highly each priority ranks.	Build a strategic funding plan. Recognize that you may need to fill gaps in funding available from the community with external funding sources, like grants. Select source water protection activities that complement or can be coordinated with other community priorities. Use data from past source water protection activities or other water systems' success stories to underscore their long-term value.
Limited cross-sector engagement (including between drinking water, wastewater, and storm water operations and beyond) and partnerships. Lack of engagement can increase the effort required to gain buy-in for proposed activities. It can also lead to conflicting or redundant efforts around source water protection.	Establish a cross-sector task force up front to ensure representation and communication across all key sectors. Source water protection activities can be designed with the needs of all parties in mind, if this engagement happens up front.
Lack of willing leaders and champions for source water protection activities. This can be particularly challenging where multiple organizations are involved.	Identify source water protection champions from the beginning—when you're developing a source water protection vison. Make a plan for where, when, and how your champions will be building support for the activity. If no individuals or groups are willing to play this role, it may be an indication that the activity is not appropriate for the community.

5. Making the business case for source water protection

Financial, political, and technical support are critical to success whether you are just beginning to develop and implement a source water protection program or looking to refine and expand an existing program. Building and articulating a compelling business case for source water protection from the start can help with setting priorities, selecting activities, and demonstrating a commitment to sustainable public health protection. This does not have to be a highly complex exercise. Depending on where you are starting from, and the resources, knowledge, and experience at your disposal, this can range from a simple exercise to an intensive financial analysis and communications campaign.

The steps outlined below align closely with and can draw from the six elements of a successful source water protection program defined under the AWWA G300 Standard (Figure 3). While the Standard describes the elements of a broader source water protection program, the business case is intended to present a compelling justification for investment in a specific source water protection activity. The business case relies on defensible qualitative and quantitative analysis that accounts for stakeholder perspectives.

Defining a source water protection mission and short-and long-term goals

The first step is to articulate an overall vision and short- and long-term goals for your program. This should draw from and align with the broader vision outlined for source water protection (the first step under the AWWA G300 standard), and any program goals and objectives you have already set.

The mission and goals drive and inform the information, analysis, and proposed path forward that together make up your business case. They are also a critical first step in gaining support for your efforts internally, among water system management, and externally, with local decision-makers and customers. Goals should be targeted in scope and measurable, to allow you to track progress against them over time.

Depending upon your proposed activities, and the priority threats they address, you may need to develop multiple versions of the business case, targeted at different audiences.

Making The Business Case for Source Water Protection

Figure 3

Developing a compelling problem statement

The next step is to articulate the problem that you are seeking to address, in the form of a concise problem statement. It should be directly informed by information you have gathered to characterize and assess your source water(s) and surrounding land, for the purpose of evaluating and identifying threats. Your problem statement should articulate:

- The highest priority threats
- Trends observed over time (i.e., is the threat or problem getting worse?)
- The cost (financial, environmental, and social) of inaction, and the timescale along which the cost of inaction will be incurred. This is especially critical if conditions around the source water are rapidly changing or may change soon, for example if rapid development is occurring in areas that are currently undeveloped.

The scope and focus of your problem statement will depend on who will be impacted by and involved in implementing your source water protection activities.

Articulating source water protection options

It is critical to demonstrate that you have thoroughly evaluated all options from the perspective of everyone positively or negatively affected by each option. The decision-making process for source water protection will probably be very similar to the process you use to evaluate other potential investments.

The typical decision-making drivers for publicly owned and investor owned water systems are outlined in the Decision Trees (Figures 4 and 5). Additional qualitative considerations are shown in Figure 6.

There are many different frameworks, metrics, and approaches that can be used to guide decisions, such as willingness to pay studies, return on investment analyses, and multi-criteria decision analyses to evaluate options. Cost-benefit analysis is another common framework. It is flexible, scalable, and can capture the perspectives of all stakeholders in an understandable way.

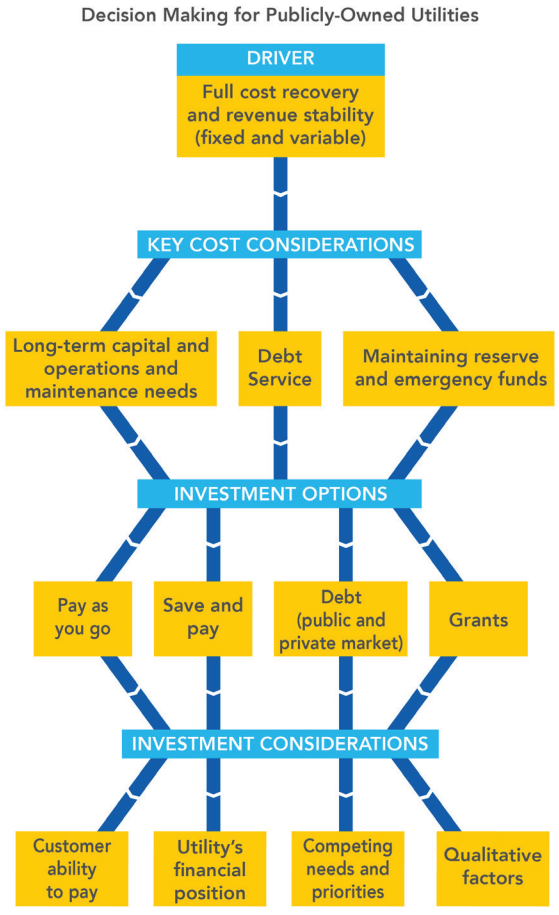

Figure 4

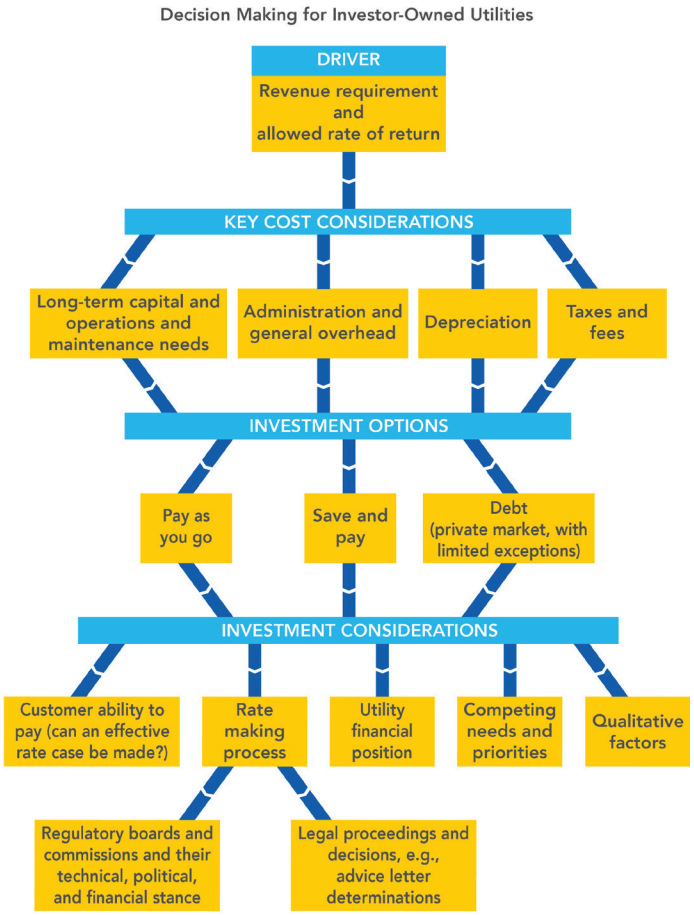

Figure 5

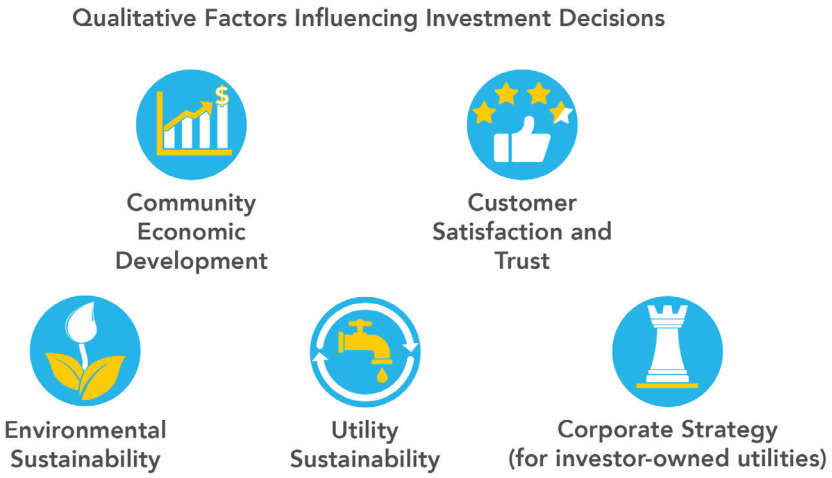

Figure 6

A cost-benefit analysis generally involves the following steps (Figure 7) (Sham and Morgan, 2016; Blue, et. al., 2015)

- Quantify the costs associated with your options, such as up-front and long-term capital, operations and maintenance, education, and other costs associated with planning, design, and implementation.
- Quantify the benefits associated with your options, such as increased property values, additional tourism income, avoided costs of additional treatment and regulatory non-compliance, etc.
- Estimate the timing of when costs and benefits would be incurred. Discount future costs and benefits to account for the fact that they do not carry the same value as costs and benefits that would be realized today.
- Estimate triple bottom line impact of costs and benefits across the utility, society (including the community, local government, local businesses affected, and others), and the environment.
- Calculate metrics and compare options based on the metrics, for example:
    - The net present value of each option, or discounted benefits minus discounted costs
    - The benefit to cost ratio (using discounted benefits and costs)
    - The pay-back period, or length of time before the original investment is recouped through benefits realized
- Account for qualitative considerations that could increase or decrease the relative appeal of one option over another.
- Evaluate the sensitivity of your results to the assumptions used in the analysis, such as timing of costs and benefits and associated discount rates.

The complexity, scope, and detail of a benefit cost analysis can vary significantly based on how much information you have available, the extent and accuracy of quantitative data available, and the range of options. Additionally, while there are established connections between natural infrastructure and water resources, accurately quantifying and adequately accounting for uncertainty and variability can be resource- and time-intensive (WRI, 2013).

This should not preclude you from conducting a structured analysis of your options, using a cost-benefit or other framework. Carefully outlining uncertainties, prioritizing which activities to target and when and where to implement them, and laying out a plan for monitoring the outcomes from these investments can help to limit any challenges with quantifying the value of source water protection.

As the decision trees (Figure 4 & 5) indicate, what is considered a cost-effective option may also vary depending on your water system's ownership profile and revenue streams. Additionally, if your system must account for revenue and profit generation requirements, you may not be able to pursue activities that are otherwise appealing and cost-effective from a social and environmental perspective.

Building a clear pathway for success

The path forward for source water protection program implementation will be finalized once you secure the necessary local support and funding. Your business case should (at a minimum) lay out a high-level overview of the implementation pathway for your proposed activity, including:

- A clear description of who will benefit and how, and when those benefits will be realized
- How much implementation is anticipated to cost, including upfront costs as well as long-term/distributed cost streams
- The funding or financing options available, and who would end up bearing the costs associated with these options
- Potential obstacles to implementation (short- and long-term) and associated solutions (which may draw from your source water protection action plan, as described under AWWA Standard G300)
- Examples of other communities in which the proposed or activity has been successfully applied

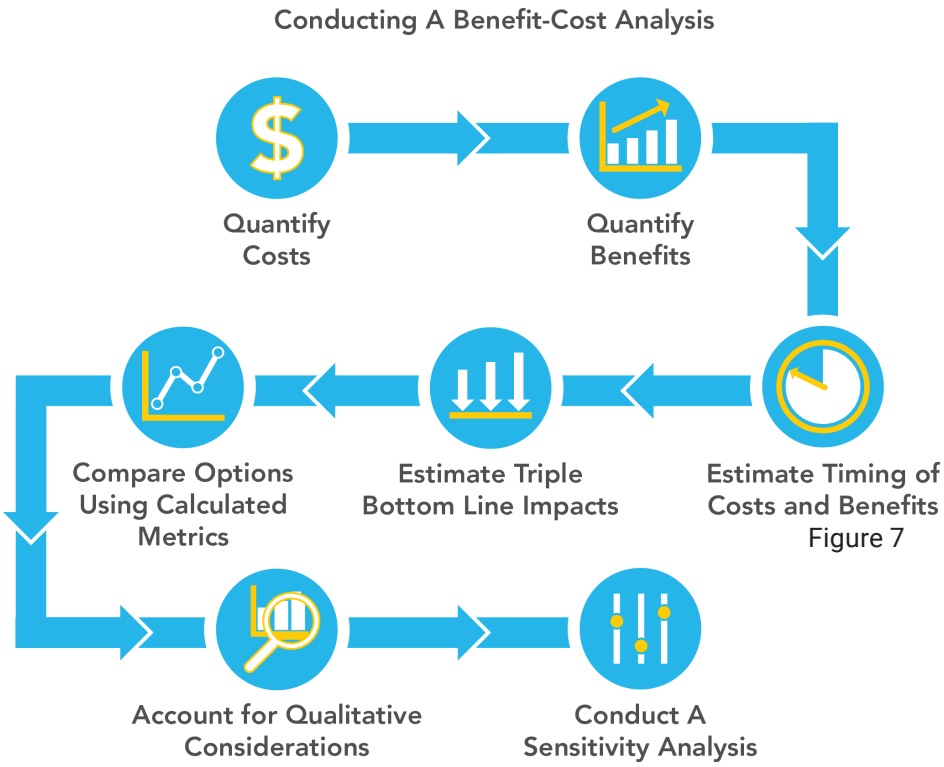

Figure 7

The City of Medford, Oregon conducted an analysis of three options for meeting temperature TMDL requirements and determined that riparian restoration was the most cost-effective option, compared to wastewater discharge to lagoon storage and mechanical chillers. The City is engaged in a water quality trading program to improve and protect the quality of the Rogue River, which is used as a supplemental drinking water source for the City (WRI, 2013; Bond, 2014).

Messaging

Tailor your approach for communicating and disseminating the business case to your audience and your system's specific circumstances. For example, your messaging may be influenced by your past experience with source water protection activities, customer base, location, contamination threats, or financial situation. While your business case will present an analysis of how the proposed activity will affect everyone, each audience will be most concerned with how it will impact them. Personalize the messaging by emphasizing the information that is most relevant to the audience and making it meaningful in a real-world situation. Your business case will include a reasoned analysis and data to back up your conclusions. Effective messaging means translating that information into a meaningful and more personal story. This is particularly important if your preferred option might have a disproportionately negative impact on a particular stakeholder group. Showing that you understand your audience's perspective and that you are looking for a mutually beneficial solution can also help to build valuable long-term trust and goodwill.

Although you may develop different versions of your business case that are tailored to specific audiences, messaging should be consistent. Designate who will be responsible for presenting your business case and interacting directly with stakeholders. This may be multiple people, depending on the scope of your proposed activity, which stakeholders are affected, and the number of external partners involved. It is also critical to designate a single leader who is responsible for directing the messaging effort. This person will also serve as a central point of contact for your internal source water protection team and external stakeholders.

Where and how you present your message matters. Stakeholders may not have an immediate interest in or understanding of source water protection. Reach out to stakeholder representatives and determine the venue and format in which the information will be best received. It is also important to understand how stakeholder groups prefer to receive their information, for example through in-person presentations, on-line resources, social media, videos. This will enable you to choose the platform with which they are most likely to engage now and in the future.

Platforms or venues for engagement may include:

- Your water system's website or other frequently accessed municipal websites
- Regularly scheduled municipal meetings or information sessions, bill stuffers
- Social media
- Short videos
- Local media (television, radio, and newspaper/web-based news outlets)
- Community events
- Industry organizations
- Local and regional environmental advocacy and stewardship group platforms
- Local, regional, or state watershed and source water protection collaboratives

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The Philadelphia Water Department has a comprehensive suite of resources on its efforts to manage and protect the watersheds that impact the city's water resources. PWD provides a history of the watershed, basic education on watershed issues and management, threats to watershed and source water health, an in-depth look at all activities underway to protect the watershed and drinking water resources, and stakeholder-specific resources (for residents, business, schools, and community groups). The resources articulate why watershed and source water health is important and beneficial, and what stakeholders can do to support the city's efforts. (PWD, 2018)

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6. Leadership and funding approaches

Even with a compelling business case for source water protection, identifying and securing funding can be a challenge. However, there are many funding options available, and communities across the country are showing increasing innovation in finding new resources and partners to fund source water protection.

The most appropriate funding source for you depends on many factors, including: community size and characteristics, debt capacity, system ownership profile, competing priorities, location, and the scope and type of activities to be funded. Local funding sources may include water system rate payers, general tax revenues, capital improvement funds, or other municipal funding. External financing such as municipal bonds, green bonds, grants, or loans may be appropriate for larger efforts. Water systems can also directly fund source water protection activities through modifications to rates or rate structures or special fees, for example.

Your state may have funding opportunities for urban renewal, land acquisition, wetland restoration, or other programs relevant to source water protection. Work with your state to determine which state and federal opportunities may be available to you.

The table on the next page highlights some of the federal funding programs that can fund source water protection activities.

Since 2011, the City of Raleigh, North Carolina charges customers a per-100 cubic foot fee (currently $0.1122) to support source water protection initiatives, treatment system improvements, and protective restoration projects (City of Raleigh, 2018). Source water protection is managed primarily through the Upper Neuse Clean Water Initiative, a land trust partnership. The Beaver Water District in Arkansas has a dedicated Source Water Protection Fund, funded by user fees of $0.04 per 1,000 gallons sold to consecutive water systems (Beaver Water District, 2018).

Agency	Program
EPA	Clean Water and Drinking Water State Revolving Fund (CW/DWSRF). The SRFs provide affordable loan financing and technical assistance for eligible activities including land acquisition, forest management, wetland restoration, best management practices, and more. EPA and states have also used the CWSRF in more innovative ways to fund activities related to source water protection, including through intermediary lending and sponsored projects (EPA, 2017a).
EPA	Section 319 Non-Point Source Implementation Grant Program. The 319 Program provides grants for source water protection activities including public education, urban and agricultural runoff treatment, wetland restoration, reforestation, and more.
USDA	Rural Development Water and Waste Disposal Loan and Grant Program. The program can fund storm water systems, land acquisition, drinking water sourcing, and other activities (USDA, 2017).
USDA	Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CERP). CRP and CERP provide financial incentives to farmers and ranchers to implement land conservation measures that improve environmental health and quality, including water quality.
USDA NRCS	Regional Conservation Partnership Program (RCPP). RCPP provides funding for partnership and collaborative efforts with agricultural producers to implement restoration and sustainability initiatives for water, soil, wildlife, and other natural resources.
USDA NRCS	Environmental Quality Incentives Program (EQIP). This voluntary program funds one-on-one assistance to agricultural producers to plan and implement conservation practices that improve water, air, and soil quality, among other benefits.
USDA NRCS	Beginning in federal fiscal year 2019, the National Water Quality Initiative (NWQI) Source Water Protection Readiness Pilot initiative will address protection of ground and surface water drinking water sources.

Innovative Uses of the CWSRF (EPA, 2017b)

The State of Washington's CWSRF program has provided loans to pass-through entities including counties and conservation districts. The pass-through entities then provide sub-loans to farmers to implement agricultural best management practices such as direct seeding. Direct seeding can significantly reduce erosion and improve soil quality, among other benefits. Washington has also used the pass-through approach to fund repair or replacement of failing septic systems, via counties and local health departments.

The State of Maine has used linked deposit financing through the CWSRF to fund implementation of forestry best management practice and purchase of green forestry equipment for logging professionals. Finally, states including Ohio, Iowa, and Idaho have used a sponsorship lending arrangement to fund non-traditional projects, such as green infrastructure, habitat and wetland restoration, and acquisition of land and conservation easements, alongside traditional projects. The community that takes on the loan and agrees to the sponsorship arrangement receives a reduced interest rate on the loan.

Non-governmental organizations (NGOs) also offer funding opportunities, often in partnership with the federal government, including:

- The National Fish and Wildlife Foundation's Five Star and Urban Waters Restoration Grant Program, co-sponsored by EPA and the Urban Waters Federal Partnership. The program funds projects that improve local capacity through assisting local partnerships in implementing source water protection activities, among other initiatives.
- Healthy Watershed Consortium Grants, a collaboration between EPA, USDA, and the U.S. Endowment for Forestry and Communities. These grants are intended to help with the development of funding mechanisms, plans or strategies, organizational infrastructure, and innovative projects aimed at accelerating the protection of freshwater ecosystems and their watersheds.

Building partnerships with local businesses, landowners, universities, and other stakeholders and technical experts can pave the way to cost-sharing or other financially beneficial arrangements. Similarly, regional authorities such as soil and water conservation districts, agricultural collaboratives, and economic development initiatives may be able to offer funding for planning or implementation of source water protection activities and programs.

As one of three national Source Water Collaborative pilot projects, an Eastern Lancaster County, PA source water collaborative initiative was formed to bring together state, regional, and municipal entities, existing water and agricultural initiatives, environmental groups, the farming community, private consulting firms, and others to promote agricultural best management practices and a cooperative approach to source water protection. Through meetings, outreach, one-on-one education and planning sessions, focus groups, and workshops, the group laid a foundation for continued success and source water protection implementation. (Ampriester, 2015).

7. Guidelines for industry and professional organizations

Geography, history, and socio-economic characteristics play important roles in the development and implementation of successful source water protection programs. Regional and state organizations are valuable partners and champions for local source water protection efforts. Neighboring water systems may share many similar characteristics, such as land use patterns and local regulations. This can present an opportunity for partnerships as well as sharing key lessons learned and best practices. Industry and professional organizations, including AWWA sections, can play an important role in identifying, promoting, and facilitating information sharing and collaboration opportunities. This is particularly valuable when the water systems that may benefit have limitations that would prevent them from pursuing these opportunities on their own.

These organizations and associations can hold training workshops, seminars, and other on-line or in-person outreach and education opportunities tailored to their region's or state's unique circumstances. Water system personnel facing similar challenges can come together to explore solutions and leverage their knowledge and experience to move their source water protection program forward. In addition, these groups can also consider establishing more formal, long-term programs to support water systems. Support may include, for example, guidance on conducting source water protection program self-assessments or third-party evaluations. By serving as a central entity for information and resources on source water protection, these organizations can improve the efficiency, effectiveness, and consistency of how information is shared and applied.

State and regional organizations may also consider setting up programs (potentially using national AWWA Exemplary Source Water Protection Award as a model) to recognize water systems that are advancing their source water protection programs to protect public health. Such recognition can motivate the awardee to sustain and expand their source water protection program, It can also help the water system enhance local support for their actions and potentially obtain additional funding.

Finally, these groups can support the formation of state or regional source water collaboratives (for example, using the model of the national Source Water Collaborative). Collaboratives can foster partnership among public, private, and non-profit organizations within the state or region to address source water protection issues. Numerous states, including Connecticut, Idaho, North Carolina, and Iowa, have established state-specific source water collaboratives that address the unique challenges their water systems and communities face in protecting drinking water sources.

8. Supplemental tools

As a supplement to this toolkit, AWWA has developed a Microsoft PowerPoint template to present the initial business case for investing in source water protection to key decision-makers such as local officials, board of directors, and investors. The template includes:

- Recommendations for slide content and sample graphics and photos. Additional slide layouts are available in the template and placeholder photos and graphics can be modified by the user within the template.
- A sample worksheet to display the outcomes of a basic cost-benefit analysis exercise.

9. Additional Resources

	General Background	SWP Activities	Business Case	Option Analysis	Outreach & Messaging	Leadership & Collaboration	Funding
AWWA G300-14 Source Water Protection and Operational Guide (AWWA, 2014 and 2016)	X	X	X		X	X	X
Beyond the Source: the Environmental, Economic, and Community Benefits of Source Water Protection (The Nature Conservancy, 2017)	X	X	X	X	X	X	X
Consider the Source: A Pocket Guide to Protecting Your Drinking Water (EPA, 2002)	X	X				X	X
Developing a Roadmap and Vision for Source Water Protection for U.S. Drinking Water Utilities (Water Research Foundation, 2012))	X	X	X		X	X	
Drought Management in a Changing Climate: Using Cost-Benefit Analyses to Assist Drinking Water Utilities (Water Research Foundation/NOAA, 2015)			X	X			
Federal Funding Opportunities for Source Water Protection (EPA, 2013)							X
How-to Manual: Update and Enhance Your Local Source Water Protection Assessments (EPA, 2006)	X	X			X	X	
Natural Infrastructure: Investing in Forested Landscapes for Source Water Protection in the United States (World Resources Institute, 2013)	X	X	X	X	X	X	X
Protecting Drinking Water at the Source: Lessons from Watershed Investment Programs in the United States (World Resources Institute, 2017)	X	X	X	X	X	X	X
Source Water Collaboration Toolkit (Source Water Collaborative)	X	X	X	X	X	X	X
Source Water Protection: Best Management Practices and Other Measures for Protecting Drinking Water Supplies (EPA, 2002)	X	X			X	X	
Source Water Protection IQ Test (Southwest Environmental Finance Center)	X	X			X	X	
Source Water Stewardship: A Guide to Protecting and Restoring Your Drinking Water (Clean Water Action, 2003)	X	X					
Using Land Conservation to Protect Drinking Water Supplies: Source Protection Handbook (The Trust for Public Land/AWWA)	X	X					
Water Finance Clearinghouse (U.S. EPA)							X

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