

Developing a Vision and Roadmap for Source Water Protection for U.S. Drinking Water Utilities [Project #4176]

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OBJECTIVES:

The overall goal of this project was to develop a vision and roadmap that can guide U.S. water utilities and supporting groups with a unified strategy for coherent, consistent, cost-effective, and socially acceptable source water protection programs. Two approaches were used to achieve this: (1) a summary was developed of the state of source water protection in the United States, and (2) a discussion was held among representatives of the water industry and related stakeholders and a consensus developed regarding a common vision and unified strategy. Combined, these efforts were used to create the *Source Water Protection Vision and Roadmap* (4176b), which, along with supporting tools, will help to motivate, catalyze, and plan new source water protection programs as well as improve existing programs.

BACKGROUND:

In 2007, a group of source water protection experts met to develop a research agenda for producing information that drinking water suppliers could use to design and implement effective source water protection programs. The result of this Source Water Protection Research Planning Workshop, sponsored by the Water Research Foundation and the Water Environment Research Foundation, was a research agenda categorized into three topic areas: Characterization and Monitoring, Tools and Control Strategies, and Planning and Program Management. The project presented in this report addresses the first two steps of the Planning and Program Management topic area group's five-year research plan.

APPROACH:

The information-gathering task was accomplished through a literature review, water utility interviews, and water utility case studies. Results of these efforts were used to define appropriate topics for the project's workshop. The workshop focused primarily on identifying critical elements of a unified source water protection roadmap and defining steps that should be taken to set this roadmap in motion. More specifically, the purpose of the workshop was to

- articulate a source water protection vision for water utilities in the United States.;
- define goals for attaining that source water protection vision;
- identify benchmarks that reflect the attainment of those goals;
- develop strategies for achieving the benchmarks identified; and

- organize the vision, goals, benchmarks, and implementation strategies into a roadmap for source water protection for U.S. utilities.

RESULTS/CONCLUSIONS:

State of Source Water Protection for U.S. Water Utilities

The drinking water utility interviews helped improve understanding of the extent to which water utilities have adopted source water protection programs, and characteristics of those utilities that have programs and those that do not. Representatives from 60 municipal utilities, covering a broad spectrum of sizes and located throughout the United States, were interviewed. Twelve of the 30 surface water utility respondents indicated they had a source water protection program, although it may not be formalized or fully developed. Only one groundwater system interviewed (one of the smallest utilities) had neither a source water protection program nor a wellhead protection program, while the other 29 had some form of one of these programs.

Utilities with source water protection programs that were interviewed were asked both to describe their motivation(s) for having a program and to identify who was motivating their source water protection efforts. Most surface water utility respondents noted that their utility or municipality was the driving force; a smaller number of systems said their state or rural water associations were the motivating force. Several said watershed groups helped get efforts moving (e.g., watershed or river/lake associations, conservancies, councils). State regulatory agencies seem to play a larger role in motivating groundwater systems than surface water systems.

Eighteen of the 30 surface water utilities interviewed did not have source water protection programs, citing the following reasons (in order of most to least commonly given):

- their lack of authority to do anything to protect the source water
- restricted resources that are directed toward other higher-priority utility functions
- the belief that some other entity is responsible for source water protection
- government agencies (other than the municipalities) controlling the lakes/reservoirs used
- minimal threats and risks to the source water
- the water source being too large to implement a program effectively
- lack of a requirement for a source water protection program

Groundwater systems interviewed cited similar reasons for not having source water protection programs, though the frequency of answers differed from the surface water systems. In addition, groundwater systems said they need help and expertise to develop a program.

There are six primary steps in the process of developing and implementing a successful source water protection program: (1) a source water protection program vision, (2) source

water characterization, (3) source water protection goals, (4) source water protection action plan, (5) implementation of the action plan, and (6) periodic evaluation and *revision* of the entire program (Gullick 2003). This general concept forms the basis of the American Water Works Association's (AWWA) Standard for Source Water Protection (ANSI/AWWA G300-07; AWWA 2007a). Individual utilities can use this generalized framework but still establish and maintain source water protection programs that account for their specific local conditions and stakeholder interests. AWWA has developed a guidance document to support Standard G300-07 and help utilities develop and implement source water protection programs (Sham et al. 2010). In addition to the information provided in the Standard's guidance, approaches to developing and implementing successful source water protection strategies are discussed in this report.

Project Workshop

Twenty-one specialists in source water protection participated in the workshop, which developed a single cohesive preliminary strategy for source water protection. That strategy was refined by the project team to become the final "roadmap" in this report.

Source Water Protection Vision and Roadmap

The *Source Water Protection Vision and Roadmap* (4176b) is intended to serve as a feasible, focused path toward promoting source water protection for U.S. drinking water utilities. It is not intended to serve as an official directive, but rather is a collection of observations and recommendations organized to form a path to achieving the vision.

First, the following vision is provided to guide the path:

Source water protection is essential for providing a reliable supply of high-quality drinking water. By 2025, every public community water supply will be protected by an active source water protection program.

Secondly, cohesive themes are explained that emerged during the path's formulation. The following four themes emerged:

1. There is the need to **raise awareness** of the importance and value of source water protection.
2. Programs, efforts, and regulations affecting source water protection for drinking water supplies can at times be conflicting, redundant, or lacking in focus. There is a need for **enhanced coordination**.
3. Many utilities could benefit from the examples of peers who are further along in the process of developing a source water protection program for their own utilities. In addition, several utilities lamented the shortage of funding for their efforts as well as a shortage of funding for technical assistance positions. In these ways, there is a need for greater **support**.
4. There are issues and efforts related to source water protection that should be acknowledged more publicly. Successful source water protection efforts should be

noted and praised more frequently. Such recognition benefits a water utility and its community. In addition, however, regulatory inconsistencies that hamper source water protection should also be addressed. In these ways, there should be *increased recognition*.

The Strategic Priorities section of the roadmap provides recommendations for how to overcome the source water protection obstacles identified. The optimal way to overcome some obstacles may not necessarily be with actions taken by water utilities; attempts have been made to identify which stakeholders would be best suited to carry out the recommended actions. These strategic priorities are organized in the roadmap by the four themes identified above.

APPLICATIONS/RECOMMENDATIONS:

Source water protection has been discussed and promoted in an *ad hoc* fashion by different organizations at the national, regional, state, and local levels. It is essential to increase the awareness of source water protection at the national level.

There was consensus among workshop participants that the most successful way to champion the roadmap may be to have one person serve as its lead implementer and coordinator. Ideally, this coordinator would not be affiliated with a particular organization, but would rather work for all stakeholder groups as an overall source water protection advocate and coordinator. Presenting the roadmap to the various organizations and stakeholders included in the roadmap and getting their support would be essential, and steps would be needed to distribute the roadmap and engage the drinking water community to implement the roadmap's recommended actions.

In order to ensure the various actions recommended in the roadmap can be carried out, it is recommended that both a top-down and a bottom-up approach be taken. A top-down approach would establish a flexible framework to guide local entities (e.g., water systems, watershed organizations, and regional planning agencies) to work together to protect source water. Due to the variability of source waters and the areas from which they are derived, along with technical, social, political, financial, and regulatory differences across jurisdictions, it is unlikely that two source water protection programs would be the same. A bottom-up approach is therefore also needed, which would use local information and broad stakeholder involvement to produce a "tailored" source water protection program that addresses unique issues at the local level.

MULTIMEDIA:

Two documents were published from this research. The *Source Water Protection Vision and Roadmap* (4176b) is available in print to Water Research Foundation subscribers and as a PDF to the public. *Developing a Vision and Roadmap for Source Water Protection for U.S. Drinking Water Utilities* (4176a) is available as a PDF to the public and on a CD with the Roadmap.