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STATE SOURCE WATER ASSESSMENT AND PROTECTION PROGRAMS

FINAL GUIDANCE

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Chapter 1

Overview of Source Water Assessment and Protection and the Safe Drinking Water Act

Overview of Source Water Assessment and Protection and the Safe Drinking Water Act

I. INTRODUCTION

A. Purpose of this Document

The purpose of this document is to provide guidance required by the Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182) for state Source Water Assessment Programs [sections 1453 and 1428(b)] and for Source Water Petition Programs (section 1454). This document describes the elements of an EPA-approvable state Source Water Assessment Program (SWAP) submittal as well as EPA's recommendations for what may be included in a state Source Water Protection (SWP) Program. The document also provides an overview of how source water assessment and protection integrates with other SDWA programs and efforts and how other EPA and federal programs can assist states in developing and implementing assessment and protection programs, and vice versa.

B. Background

Public drinking water supplies have always been key to the location and development of communities. The public water supply of a community often defines and directs its growth. Historically, the location of a good source of drinking water was a key factor in determining the location of centers of population. Indeed, safe drinking water was essential to the quality of community life because of the link between public health and the quality of the public water supply.

We can look at our own history to see how important a safe, adequate source of water has been to the development of our country. Early settlements were charted, in part, according to a ready supply of water for drinking, irrigation, and farming. One early American example of the importance placed on maintaining a clean source of water is Lord Delaware's proclamation for Jamestown, issued in 1610:

> There shall be no man or woman dare to wash any unclean linen, wash clothes, . . . nor rinse or make clean any kettle, pot or pan, or any suchlike vessel within twenty feet of the old well or new pump. Nor shall anyone aforesaid within less than a quarter mile of the fort, dare to do the necessities

> of nature, since by these unmanly, slothful, and loathsome immodesties, the whole fort may be choked and poisoned.

Today, states, municipalities, water suppliers, and citizens have undertaken efforts to protect the drinking water supplies of their communities. From Anaheim, California to Portland, Oregon to Tallahassee, Florida to Boston, Massachusetts and places in between like Dayton, Ohio and El Paso, Texas, people are using several tools to protect their sources of drinking water, including well-head protection (WHP), watershed protection, and reservoir management. And this is happening not only in the cities and large towns; thousands of small and rural communities are also actively engaged in protecting their source waters. Actions have also been taken on the federal level to protect water supplies. For example, the Clean Water Act (CWA) ensures protection of surface waters designated, in part, for use as drinking water. Other environmental laws—the SDWA (which includes the WHP Program, the Sole Source Aquifer (SSA) Program, and the Underground Injection Control (UIC) Program), Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)—provide authorities, financial support, and technical assistance to protect sources of drinking water, especially ground water.

1. EPA's Source Water Protection Goal

Since the 1986 Amendments to the SDWA, which established the WHP Program, EPA has supported states and communities in their efforts to protect their sources of drinking water. An Agency SWP goal is that "by the year 2005, 60 percent of the population served by community water systems will receive their water from systems with SWP programs in place under both WHP and watershed protection programs."

How is EPA going to accomplish this goal? First, we will build on the solid foundation in place due to the collective efforts since the SDWA 1986 amendments, including WHP Programs, SSA Programs, and public water system (PWS) monitoring waivers and treatment exemptions that are based on the existence of SWP efforts. Furthermore, the Agency will continue to build on the successes and efforts of EPA's Watershed Protection Approach, Nonpoint Source (NPS) Programs, Comprehensive State Ground Water Protection Programs (CSGWPPs), the Toxic Release Inventory (TRI), pollution prevention and community-based initiatives, and other

federal programs such as the U.S. Department of Agriculture (USDA) Conservation Reserve Program (CRP). For example, EPA Headquarters and Regional SWP representatives will work with their counterparts in the NPS Program to help ensure that NPS threats identified through source water assessments are acknowledged as concerns by both programs.

Second, we will make full use of the new tools and resources provided under the 1996 SDWA amendments, with their emphasis on public involvement and state SWAPs, which are logical first steps toward state SWP Programs. Also, the amendments provide states an unprecedented opportunity to set aside funds from the new Drinking Water State Revolving Fund (DWSRF) for eligible source water assessment and protection activities.

2. Past Accomplishments of EPA and its Partners

Prior to the 1996 SDWA, EPA emphasized ground water and wellhead programs and the Watershed Protection Approach to protect source waters. The approval of state WHP Programs was a core component of this effort along with the formation of multiple partnerships with agencies and associations that had an interest in SWP, such as the following:

- States
- National Rural Water Association
- American Water Works Association
- National Association of Towns and Townships
- National Association of Counties
- League of Women Voters
- Retired and Senior Volunteer Program
- Groundwater Foundation

From these partnerships grew public information networks and information sharing. The EPA Community Source Water Protection Mentor Project, which provides individual mentors to help implement protection efforts in communities, was established, and the CWA sections 106 and 319 programs were put to new uses. The SSA Program was used to protect major underground sources of drinking water, and CSGWPPs have been a vehicle for focusing contaminant source control programs on the protection of drinking water sources. The Watershed Protection Approach also has provided the critical means to better focus water pollution control efforts on the protection of drinking water supplies. Watershed protection tools and information have been developed and broadly disseminated to communities through such vehicles as the internet and highly successful national conferences. States, such as Massachusetts and Illinois, and large systems, such as Portland, Boston, Seattle, and New York,

have developed extensive watershed protection approaches to protect their drinking water supplies from potential contamination as a way to ensure the highest quality water and to reduce treatment costs.

II. SDWA AMENDMENTS OF 1996—NEW RESOURCES AND TOOLS FOR SOURCE WATER PROTECTION

The SDWA Amendments of 1996 provide an even greater focus on prevention as an approach to ensuring safe drinking water that complements the traditional treatment approach. This approach aims to prevent problems by increasing both PWSs' capacity to provide safe drinking water and protecting the source waters from which we draw our drinking water.

There are linkages among different parts of the law which together create a tapestry of interwoven provisions in which the prevention programs are integrated with, and essential to the success of, the new regulatory flexibilities in the amendments.

The amendments embody the concept that new, responsible regulatory flexibility (within a baseline of national protection) is appropriate, if triggered by sound information on relevant local conditions. For instance, with respect to monitoring, states can provide flexibility to systems, but it must be based on a history relatively free of contamination and a good scientific grasp of each system's susceptibility to contamination.

The new prevention provisions in the Amendments has two key elements:

- A clear state lead, with flexibility and resources to achieve results. This is necessary because prevention is ultimately about land use and water quality management, which generally are exercised at the state and local levels.

- A strong ethic of public information and involvement within the states' decision-making processes.

The SDWA requires states to establish and implement SWAPs which include both of these elements. EPA, both in Headquarters and in the Regions, is committed to helping ensure successful assessments. As such, EPA will provide assistance to the states to:

- Ensure that each state sets aside and uses the amount of funding from the DWSRF necessary to do a solid job on the assessments.

- Stretch the assessment dollars by working to get the strong involvement of all appropriate participants and contributors.

- Encourage networks for exchange of information about models for assessments that have worked for states, communities, and water suppliers in other areas.

- Identify and help use other applicable information that can contribute to or serve for the assessments, as the law provides.

In the area of SWP, the law represents a real, national commitment to try the flexible, state-driven prevention approach. There is great flexibility for states to shape their own SWP programs, with the funding available under the DWSRF program set-aside provision, section 1452(g)(2)(B). This provision enables states to adopt SWP programs that fit the needs and conditions of each state.

In making linkages between the source water provisions and other provisions, including regulatory ones, the Amendments create a powerful incentive for fully implementing SWP programs. Simply put, the law will not work as effectively and many of the flexibilities it offers will not be available without a strong nationwide commitment to SWP.

Chapter 4 details many of these linkages for source water assessment and protection. But virtually every new section of the law contains important examples. For example, the Section 1420 capacity development provisions—in which states must develop a strategy and take several actions to boost and ensure the technical, financial and managerial capability of water systems reliably to deliver safe drinking water— have many linkages which are similar to source water. Just as the base of information and analysis from a source water assessment is vital for monitoring flexibility, so the capacity development strategy can generate such a base to equip states to make decisions on restructuring and water supply alternatives necessary to offer the flexibilities of variances and exemptions to small systems. The two programs are directly linked in that the challenging task of achieving increased capacity through improved management of the water resources and/or physical infrastructure will be easier and cheaper if SWP can help provide the water system with cleaner source water.

Some of these linkages are in common. For both source water and capacity, the annual Intended Use Plan (IUP) that must be prepared for the DWSRF set-aside funds is the opportunity to make the public case for these prevention activities. And because the SDWA Amendments only ensure funding once for source water assessments and capacity development strategies alike, states need to be sure the

programs they propose in these IUPs are the right ones to equip them to make these linkages. Similarly, public participation is required by the Amendments in developing both of these programs, and in the IUPs, to ensure that states' exercise of their wide discretion in these programs is responsive to their constituents' needs, preferences, and conditions.

A. The Benefits of Public Involvement

The 1996 Amendments place a strong emphasis on public awareness and involvement. For example, EPA is to develop a regulation for community water suppliers to provide an annual consumer confidence report that includes information on each system's source waters. States are required to involve the public in developing SWAPs [section 1428(b)], and the actual source water assessments for PWSs must be made available to the public, in addition to information on contaminant occurrence and drinking water standards violations.

Involving the public in source water assessments and protection programs offers states and localities the opportunity to channel the energies of an increasingly informed public into efforts to protect their water supplies. It is critical to increase public involvement in the actual development of the state SWAPs in order to build a base of support for using the assessments once they are completed. Stakeholder involvement can help states clearly define goals for the assessments, design the process for completing inventories and susceptibility determinations, define the role of protection measures, and determine the best use of set-asides from the DWSRF for these activities.

B. Assessment Programs

Chapter 2 of this document provides guidance to states by explaining a new section 1453 and section 1428(b) of the SDWA for state SWAPs. States with Public Water Supply Supervision (PWSS) program primacy must submit SWAPs to EPA for approval. States must submit their program to EPA no later than 18 months after EPA publishes this final guidance. A state program is automatically approved 9 months after submittal to EPA unless EPA disapproves the program (or portion thereof).

A state SWAP must: (1) set forth the state's strategic approach to conducting the assessments; (2) delineate the boundaries of the areas providing source waters for PWSs; and (3) identify, to the extent practical, the origins of regulated and certain unregulated contaminants in the delineated area to determine the susceptibility of PWSs to such contaminants. Assessments are to be completed for all PWSs within 2 years

after EPA approval of the state's program. EPA may extend this period up to 18 months taking into account funds made available to the state under the DWSRF. States must make the results of the source water assessments available to the public. To avoid duplication, assessment programs may make use of sanitary surveys, state WHP Programs, pesticide state management plans, state watershed approaches including efforts under the Surface Water Treatment Rule (SWTR), and efforts under the Federal Water Pollution Control Act (Clean Water Act).

For a state to tailor alternative monitoring requirements for PWSs under a new alternative monitoring authority [section 1418(b)], a state must have an EPA-approved SWAP. Any PWS seeking alternative monitoring requirements under a state's alternative monitoring authority must have completed an assessment of its source water(s).

Each source water assessment needs to be, as stated in the statute, "for the protection and benefit of the public water systems" [section 1453(a)(1)]. In other words, Congress clearly desired the assessment as a precursor to the development of a full SWP program to protect the drinking water for that area. Indeed, an assessment provides essentially the first three steps of a full prevention program: delineating the source water protection area, inventorying the significant potential sources of contamination, and understanding the susceptibility of the source waters of the PWS(s) to contamination. However, it may be done simultaneously with other actions that complete a prevention program: forming a team, monitoring source water quality, implementing management measures for sources of contamination, and contingency planning. In any event, assessments are a tool for further efforts— not a complete process in and of themselves. Congress explicitly recognized this in the numerous statutory references to the further application of the section 1453 assessments.

To be effective tools, SWAPs need to be measured for success. The basic measure of state performance is whether a state completes the program as described in its approved program submittal. A program is complete when all local assessments are accomplished in accordance with the state's EPA-approved SWAP.

However, because EPA's goal is to implement full SWP programs for at least 60 percent of the population served by CWSs (144 million Americans) by the year 2005, EPA will also encourage states and localities to implement prevention programs. EPA will track progress towards achieving this goal. Agency efforts to achieve this goal focus on encouraging the states to actively help their

PWSs develop full SWP programs, although such programs are not required by the SDWA amendments.

C. Source Water Protection and Petition Programs

While these programs are voluntary, EPA believes it is wise for states to plan for protection programs at the same time they plan for and implement their SWAPs. Such simultaneous planning would provide both efficient use of taxpayers' SWAP funds and accountability to the public regarding productive use of source water assessment information. In particular, states will likely use current information on the hydrogeology of different regions of the state to determine the level of detail in assessments necessary to support protection program options under consideration. Finally, opportunities for flexibility for PWSs under federal monitoring regulations, ground water disinfection regulations, Class V UIC programs, and filtration will likely benefit from, and in some cases be contingent on, having protection programs in place.

Chapter 3 of this document describes many options that states may consider in developing SWP programs that go beyond their required assessment program, including: statewide or local SWP Programs; WHP Programs; innovative local, partnership approaches; and petition programs of various types. States may approach these options in different ways. For example, some states may prefer to develop statewide SWP Programs using one basic model while allowing PWSs some discretion to make modifications based on local conditions. Other states may allow systems considerably more discretion to develop and implement approaches that are based almost entirely on the results of system-level assessments.

The Petition Program, as described under section 1454, is an entirely voluntary incentive-based approach. The intent of the Petition Program is to receive, approve, and respond to petitions from a PWS operator/owner or local government. Petitions request assistance in the development of voluntary local incentive-based partnerships to (1) reduce the presence of contaminants, (2) provide financial or technical assistance requested, and (3) develop recommendations for voluntary, long-term SWP strategies.

Chapter 3 describes some of the benefits and limitations of the section 1454 program and some modifications that a state may consider when adopting such a program. Further, Chapter 3 describes how a state-tailored Petition Program could be eligible for funds set aside from the DWSRF.

D. Drinking Water State Revolving Fund and Other Financing

States may set aside funds from the DWSRF to finance the source water assessment and protection activities described above. This includes three possible set-asides: (1) up to 10 percent of a state's allotment for the DWSRF to administer or provide technical assistance for SWP programs within the state; (2) up to 15 percent of the state's capitalization grant for more than one of several SWP activities (i.e., land acquisition/easements, voluntary protection and petition activities, source water assessments and WHP); and (3) up to 2 percent of the state's allotment for additional technical assistance to small PWSs. **Funds for source water assessments are only available from FY 1997 allotments. States can apply for these funds in FY 1997 and FY 1998.**

States must match, dollar-for-dollar, the 10 percent set-aside noted in number (1) above, though certain existing state expenditures may substantially meet the match requirements. For the latter two set-asides, the 15 percent and 2 percent, there are no separate state match requirements. As a separate match, each state is required to provide a 20 percent match for the entire DWSRF capitalization grant to the state (see the final DWSRF Guidelines for a full description of this 20 percent match requirement). Funds set aside from the DWSRF can also be used for PWS activities that may complement SWP, such as operator certification and system capacity building.

In addition, the new SDWA amendments contain separate provisions —not funded through the DWSRF provision—with funding authorizations for WHP Programs, CSGWPPs, and the UIC Program. However, appropriations for the WHP and CSGWPP programs were not provided in FY 1997, and UIC funding will likely remain at the level of previous years. Additional financial support for local SWP activities may be available under CWA section 319 grants to state NPS programs or section 106 programs, and there may be opportunities for targeting the resources of other programs, such as pesticide State Management Plans (SMP) or USDA Farm Bill conservation programs, to support source water assessment and protection efforts.

The Clean Water Act State Revolving Fund (CWSRF) provides a powerful partnership between EPA and the states, allowing flexibility to fund projects that will address states' highest priority water quality needs. While traditionally used to build or improve wastewater treatment plants, loans available under the CWSRF are being used increasingly for agricultural, rural, and urban runoff control; estuary improvement projects; wet weather flow

control, including stormwater and sewer overflows; and for alternative technologies. As they evaluate source water assessment and protection options, states may consider how to access the CWSRF and the other funding sources described above.

III. COORDINATION AND INTEGRATION

A. Source Water Assessment and Protection and Other Public Water Supply Supervision Program Implementation Efforts

Chapter 4 explains how EPA plans to continue its efforts to incorporate source water assessment and protection into the regulatory and programmatic functions of the PWSS Program. These linkages are essential to ensuring that prevention efforts lead to better-quality drinking water. When increasing systems' capacities, certifying operators, conducting sanitary surveys, reforming monitoring, improving small system operations, or implementing standards, PWS managers have an unprecedented opportunity to ensure that prevention efforts are enhanced by these components of the overall drinking water protection program. For example, source water assessments will generate information on significant potential contamination sources and on the susceptibility of systems to contamination by these sources that may help states target systems for additional or reduced monitoring, or for actions to help assure compliance with drinking water standards.

B. Source Water Assessment and Protection and the Watershed Protection Approach

The development of state SWAPs and SWP Programs offers a unique opportunity to integrate not only drinking water programs, but also to integrate drinking water, clean water, coastal, solid and hazardous waste, agricultural and other environmental management programs so that they work together to better protect public health and the environment while reducing duplication of effort and program costs. The watershed protection approach provides a framework in which to achieve better program integration, improve identification of the highest priority problems, and increase stakeholder input. The watershed approach focuses federal, state, tribal, and local government programs and citizen efforts on environmental and public health management within hydrologically defined geographic areas, taking into consideration both ground and surface water flow. Watershed protection approaches may vary in terms of specific objectives and resources. They emphasize partnerships (with the people most affected by management decisions), a geographic focus, and scientific data, tools, and

techniques. Many states are developing strategies for watershed management. Source water assessment and protection programs could be an integral component of these strategies.

Operating and coordinating programs on a watershed basis makes good sense for environmental, financial, social, and administrative reasons. For example, by jointly reviewing the results of assessment efforts undertaken for SWP, total maximum daily loads (TMDLs), state water quality inventories, volunteer monitoring, state NPS programs, and other aquatic resource protection program managers at all levels of government can better understand the cumulative impacts of various human activities and determine the most critical problems within each watershed. Using this information to set priorities for action allows these managers to allocate limited financial and human resources to address these problems.

Establishing environmental indicators helps guide activities toward solving those high-priority problems and measuring success in making real world improvements rather than simply fulfilling programmatic requirements. Besides driving results towards environmental benefits, the approach can result in cost savings by leveraging and building upon the financial resources and the willingness of the people with interests in the watershed to take action. Through improved communication and coordination, the watershed protection approach can reduce costly duplication of efforts and conflicting actions.

Finally, the watershed protection approach strengthens teamwork between the public and private sectors to achieve the greatest environmental improvements with the resources available. This emphasis gives those people who depend on the aquatic resources for their health, livelihood, or quality of life a meaningful role in the management of the resources. Through such active and broad involvement, the watershed approach can build a sense of community, reduce conflicts, increase commitment to the actions necessary to meet societal goals and, ultimately, improve the likelihood of sustaining long-term environmental improvements.

C. Source Water Assessment and Protection and Other Federal/State Agency Programs

In Chapter 5, we indicate how delineating source water protection areas, inventorying significant potential sources of contamination in those areas, and making susceptibility determinations can benefit, and benefit from, other EPA programs and federal programs. For example, delineating source water protection areas will enable other programs to identify

where these areas are located. Also, as assessments are completed, these other federal programs (and in some cases state programs) will be able to reset priorities for prevention efforts to reduce or eliminate contaminants flowing into PWS wells or intakes. For some PWSs, this could mean significant increases in efficiency through both reduced monitoring and reduced need for new or more expensive treatment technologies. The delineated source water protection areas will also certainly increase the awareness of federal, state, and local managers of other programs that action in these areas may be a high priority for the protection of human health.

Similarly, the benefits that other EPA and federal programs can provide to state and local source water assessment and protection efforts are potentially very large. The information, authorities, technical and financial resources, and communication networks that these other programs have can be invaluable in helping the states and PWSs conduct the assessments and implement protection measures. See Chapter 5 for specific examples of benefits provided to source water assessment and protection programs by other EPA and federal programs. In the coming year, EPA plans to develop a much more detailed handbook on the opportunities for integration of SWP efforts with the vast array of federal and state programs.

IV. EPA Technical Assistance

EPA has many resources to assist these programs. For example, a comprehensive listing of all WHP Technical Assistance Documents and how to secure them is described in a document titled *Office of Ground Water and Drinking Water (OGWDW) Publications* (EPA 810-B-96-001). Other documents and information on SWP and WHP are available at OGWDW's internet homepage found at [http://www.epa.gov/OGWDW]. Another compendium now available on the internet [http://www.epa.gov/owow/watershed/tools/] is titled *Watershed Tools Directory: A Collection of Watershed Tools* (EPA 841-B-95-005). These documents are available by calling the Safe Drinking Water Hotline at (800) 426-4791, or by e-mailing a message to: hotline-sdwa@epamail.epa.gov. There are several forthcoming documents on delineation methods such as *State Source Water Protection Area Delineation Methods For Surface Water Drinking Water Supplies*; *Delineation of Source Water Protection Areas: An Integrated Approach For Ground and Surface Waters, Case Studies For the Conjunctive Delineation of Ground-Water/Surface-Water Source Water Protection Areas*; and a *Compendium of Wellhead Protection Area Delineation Documents.*

In addition, over the next 2 years, EPA will sponsor or cosponsor source water assessment/protection conferences and meetings. For instance, a conference with the National Governors' Association and five other state executive branch organizations will be held in 1997. In addition, a conference entitled, "Source Water Quality and Protection: Delineation, Monitoring and Effectiveness" is tentatively scheduled for the spring of 1998.

V. Conclusion

Source water assessment and protection programs provided for under the 1996 amendments to the SDWA offer opportunities and tools to protect drinking water at its source. In so doing, the President and the Congress have committed the nation to the building of a pollution prevention barrier to drinking water contamination. Each of us is challenged to do our part in carrying out this commitment—to make SWP a worthy complement to the drinking water treatment process. This guidance is the product of the efforts of a wide array of stakeholders from states, other federal agencies, local governments, water providers, businesses and environmental and citizen groups. We are fully engaging these groups in many ways and appreciate the contributions made by each stakeholder. We hope this open and inclusive process is a model for how the Agency will do business in the future. (See Appendix A.)

Chapter 2

Final Guidance for State Source Water Assessment Programs

Final Guidance for State Source Water Assessment Programs

I. INTRODUCTION

The SDWA Amendments of 1996, P.L. 104-182, include amendments to section 1428, and a provision adding a new section 1453 to the Act. Section 1453 requires states to develop, submit to EPA, and implement, once approved, SWAPs. These required state SWAPs are to be submitted to EPA no later than 18 months after EPA publishes this guidance in final. The states must meet all the requirements under sections 1453 and 1428 (b) and (c) of the SDWA Amendments of 1996. Within 2 years after EPA approval of the program (unless extended), states are required to complete assessments for all PWSs which include source water protection area delineations, inventories of certain contamination sources, and determinations of susceptibility that provide for **"the protection and benefit of public water systems."**

This document provides guidance to EPA personnel and states on how best to implement the Source Water Assessment and SWP programs under the SDWA, as amended. It also provides guidance to the public and to the regulated community on how EPA intends to exercise its discretion in implementing the source water assessment and protection provisions of the SDWA. The guidance is designed to implement the statutory requirements and national policy on these issues.

States are required to involve the public in developing their SWAPs and to make the results of the assessments for public water supplies available to the public when completed. In doing so, EPA expects that such information will encourage the development and implementation of complete local SWP Programs, which incorporate the SWAP assessment functions, and add the establishment of local teams, source management, and contingency planning. (See Chapter 3 for descriptions and means for supporting these additional steps of a complete SWP Program.)

The core purpose of the source water assessments in any source water protection area is to provide a strong basis for developing, implementing, and improving SWP actions in that source water protection area. Furthermore, states need to consider the many other programs under the SDWA and other environmental laws (detailed in Chapters 4 and 5) whose success for public health protection depends upon source water assessments, EPA strongly recommends that these assessments be viewed not as activities

done for their own sake, but to protect source waters, and to establish a "good science" basis for providing greater regulatory flexibility to reduce costs and maintain the delivery of safe water to the public.

The elements that a submittal will need to contain in order to be approved by EPA are described in Part II in this chapter. Many of these are explicit in sections 1453 and 1428 and must be included as specified; many other elements, EPA believes, are crucial for an effective SWAP. For these latter elements only, where a state can show it has an equivalent alternative(s), EPA will approve the alternative element(s), provided that the state demonstrates that the alternative meets the same functional objectives. There are also several recommendations that EPA will make for state submittals, but these recommendations are optional for the states. In other words, EPA is not seeking to apply the guidance as a regulation, but intends, where appropriate, to allow equivalent alternatives to meet the functional objectives of the statute.

Tribal Organizations. While the statute does not explicitly require the tribes to implement SWAPs, EPA recommends that each tribe implement such a program to the extent appropriate resources are available to do so. Tribes can benefit from ensuring that the PWSs on tribal lands undertake assessments. Some tribes have implemented WHP activities and watershed approaches. If so, these tribes have already begun to delineate their source water protection areas and likely have begun a contamination source inventory. These tribes are encouraged to continue to implement these programs.

If a tribe decides to establish and implement a program, it may submit it to EPA for approval. The process and timetable for tribal programs, once submitted to EPA, will be the same as described here in Chapter 2 for states. EPA and an interested tribe will negotiate a timetable for implementation based on its resources for the program.

Tribes may also want to consider participation in a state SWAP as an alternative to, or in conjunction with, their own program. This could include involvement on a state's technical and citizens advisory committee(s), as described in section II.A of this chapter.

Tribes can finance development and implementation of a SWAP in various ways. One possibility is to receive funding from the states. Tribes can also apply for EPA to fund part of their programs using EPA's discretionary funds. Several tribes have used CWA funding to support source water assessment-type efforts.

Organization of this Chapter. The remainder of this chapter is presented in three parts:

- Part II includes the requirements and options for: public participation in developing the state submittal; the state's assessment approach; making assessments available to the public; and program implementation.

- Part III includes the specific requirements for when and how the states will submit SWAPs to EPA and when and how EPA will approve or disapprove them.

- Part IV includes a discussion of the opportunities for states to use the DWSRF and other funding sources for developing and implementing SWAPs.

II. CONTENT OF STATE SUBMITTALS

In order to be approved, a state submittal needs to contain the following four sections:

- Description of how the state achieved public participation in developing its submittal. (See section II.A.)

- Description of the approach the state will take to implement a SWAP, including the goals for the state SWAP consistent with the national goals of protecting and benefiting PWSs. (See section II.B.)

- Description of how the state will make the results of assessments available to the public. (See section II.C.)

- Description of how the state will implement its chosen approach to SWAPs. (See section II.D.)

A. Adequate Public Participation in Developing the State Source Water Assessment Program

Section 1428 (b) of the SDWA requires that, "to the maximum extent possible, each state shall establish procedures, including but not limited to the establishment of technical and citizens advisory committees, to encourage the public to participate in developing the protection program for wellhead areas and SWAPs under section 1453. Such procedures shall include notice and opportunity for public hearing on the state program before it is submitted to the Administrator." EPA believes Congress intended that a state's public participation process would build public support and

responsibility for local water supplies. Therefore, to achieve this goal, for a SWAP to be approvable, a state needs to have utilized a public participation process for developing and implementing a SWAP.

Further, to understand how the state implemented section 1428(b), a state submittal needs to contain a description of how the state ensured broad representation on advisory groups and wide public involvement in developing its submittal by having:

- Convened a statutorily required statewide technical advisory committee and a citizens advisory committee. One committee is possible if a state demonstrates in its submittal that the structure, membership, and process of the committee provided for viewpoints for both technical (i.e., technical feasibility and effectiveness of a state's SWAP approach) and citizens (i.e., desirability and appropriateness of a state's SWAP approach) considerations. The state needs to provide adequate opportunity to participate on the advisory committee(s) to representatives of public interest groups (e.g., river and watershed organizations), public health groups (e.g., medical associations), vulnerable population groups (e.g., elderly, transplant patients, dialysis patients, chemotherapy patients, people living with HIV/AIDS), business groups (e.g., agricultural chemical manufacturers and small businesses), local governments, tribes, land conservation groups, drinking water suppliers of various type and sizes, wastewater treatment plant operators, farmers and developers, and others. While a state needs to provide opportunities for these groups to participate, it may still proceed with program development or implementation if any group decides not to participate.

  Because a state's response to the recommendations of the committee(s) should be on the public record, a state needs to describe in its submittal the advice of the committee(s) regarding key program development questions such as those identified in the several tables in this chapter. (See Tables 1 through 6.)

- Conducted public hearings or public workshops, focus groups, conference calls, or meetings around the state with prior dissemination of invitations and basic information. Opportunities need to be provided for general

public involvement by wide and effective advance notice of the involvement process; wide distribution/availability of decision planning documents with adequate time to review; meaningful and substantial opportunities for all interested parties to provide detailed comments; and provision of direct, genuine feedback from state program officials. In addition, a state might consider internet conferences or other outreach actions.

Furthermore, a state needs to include in its submittal a responsiveness summary showing how the significant public comments and opinions were used in developing the submittal. These may be full written responses on the record to all substantive comments, summarizing agreement, disagreement, and substantive reasons for each.

States may use certain DWSRF set-aside funds to reimburse members of the committee(s) or others for travel and other expenses associated with public participation, based on identified need. However, EPA recommends that such expenditures be consistent with the level of funding afforded for the entire assessment effort.

To the extent that:

(1) A state has implemented these required SWAP elements for public participation during development of its WHP Program and/or Watershed Approach, (or when developing the state's ground water or the state's surface water programs); and

(2) These programs included delineations, source inventories, and susceptibility determinations similar to the requirements in this guidance;

the state needs to undertake only those public participation requirements it has not previously completed.

EPA strongly encourages the state to continue to work with its technical and citizens committee(s) to solicit advice as the assessments are being done. The committee(s) will provide valuable linkages to the stakeholders within the state as assessments are completed and the results and assessment information are made available to the public. In addition, the committee(s) can advise the state on how to use the assessments in implementing prevention programs and improved treatment methods.

Table 1
Public Participation:
Key Issues for Advisory Committee(s)

1. Should the state do more to provide adequate opportunity for stakeholder groups to participate in development of the program? If so, how?

2. Should the state do more to receive recommendations from both technical and citizen's perspectives?

3. What should the state do for ongoing public participation in implementing assessments once the state's SWAP is approved?

STATE TECHNICAL AND CITIZENS ADVISORY COMMITTEES

- **Oregon Department of Environmental Quality (DEQ):** Oregon's DEQ developed a WHP Advisory Committee for policy review and technical advice for their WHP Program. The committee, 16 people from industry, utility companies, environmental organizations, not-for-profits, and state and local government, met a total of fourteen times over a period of two years from 1992 to 1994. DEQ offered to pay travel expenses, but only one member requested reimbursement, based on need. Meetings were open to the public.

  Potential members knew what was expected of them before joining the committee. DEQ explained the extent and duration of the commitment, the goal of working through issues to provide substantive input, and the reality that the committee's recommendations would not necessarily be DEQ's final policy decision. The committee's public concurrence with the final product was one of many extremely valuable benefits of the process.

  A significant part of the success of the committee was due to DEQ's efforts at planning even before the first meeting. Committee meetings were staffed by two people: one to take notes or minutes and handle the logistics and administrative tasks, and one to provide technical and policy guidance and develop the agenda. The committee presented recommendations to DEQ on all aspects of the WHP Program.

- **Illinois Environmental Protection Agency (IEPA):** The Illinois EPA built on its tradition of public involvement in forming a Source Water Protection Technical and Citizen's Advisory Committee. The committee of 21 represents PWSs, environmentalists, business, farmers, and federal and state government. IEPA provides administrative support and a meeting room and offers travel expenses. The option of reimbursement ensures that committee membership is based on qualifications, not geography.

  Prior to the first meeting, committee members received copies of IEPA's planning documents and the U.S. EPA *State Source Water Assessment and Protection Programs Draft Guidance*. The meeting was devoted to discussion of the structure and composition of the committee itself, background on the new SDWA and IEPA's related programs, and input and suggestions on IEPA's proposed source water assessment and delineation program. In future meetings, the committee will continue to provide detailed input to IEPA.

  The committee will continue to meet on demand throughout the planning and implementation of the program. Illinois has many mechanisms for public participation, and indeed many Technical and Advisory Committee members serve on other committees as well. Therefore, the group decided to meet on an as-needed basis. One specific focus of the group will be to provide input on the development of public documents.

  In addition to the committee's input, IEPA is holding a public hearing on the CWA and SDWA revolving loan funds intended use plan. Advance notice of the public hearing was sent out to over 200 potential watershed and ground water stakeholders. A detailed presentation of IEPA's proposed source water assessment and delineation program will be presented at this hearing. Public comment forms, to obtain written input on the program, are also planned.

B. Requirements/Options for State Assessment Approaches

1. Statutory Requirements

The goals for state SWAPs are written in the statute at section 1453 (a)(1), which provides that assessments will be accomplished ". . .for the protection and benefit of public water systems and for the support of monitoring flexibility. . . ."

Section 1453 (a)(2)(A) requires that states "delineate the boundaries of the assessment areas in such state from which one or more public water systems in the state receive supplies of drinking water, using all reasonably available hydrogeologic information on the sources of the supply of drinking water in the state and the water flow, recharge, and discharge and any other reliable information as the state deems necessary to adequately determine such areas."

Section 1453 (a)(2)(B) also requires that states "identify for contaminants regulated under this title for which monitoring is required under this title (or any unregulated contaminants selected by the state, in its discretion, which the state, for purposes of this subsection, has determined may present a threat to public health), to the extent practical, the origins within each delineated area of such contaminants to determine the susceptibility of the public water systems in the delineated area to such contaminants."

Section 1453 (a)(3) requires, in part, that "the Administrator's approval of a state program under this subsection shall include a timetable . . . allowing for not more than 2 years for completion after approval of the program." "The Administrator may extend any timetable. . . to extend the period for completion by an additional 18 months."

2. Strategic State Approaches

(a) Initial State Actions

One of the first steps in any SWAP needs to be a review of relevant, available sources of existing data (including susceptibility determinations) at the federal, state, and local levels. This would include gathering and analyzing the data to determine what additional information may need to be collected and analyzed to complete individual assessments and the state's assessment program. Many states have already gathered considerable data on contamination sources, performed vulnerability assessments, and analyzed monitoring data on contaminants in implementing the Phase II and V rules and in developing approved waiver programs under those rules. Many states have also performed similar work in developing WHP programs. EPA strongly encourages states systematically to assemble, review,

and as appropriate utilize information and analyses from these and other existing sources including those specified in section 1453 (b)(6), early in their SWAP implementation. Such information sources could include delineations and assessments done under a WHP program or state watershed approach; vulnerability assessments, sanitary surveys, monitoring programs, delineations and assessments done under a state management plan for pesticides; and any other delineations and assessments done under the CWA (including state 305 (b) reporting particularly for waters designated to be used for drinking water sources under state water quality standards), or under state or local statutes. Moreover, any water system with an existing waiver may already have a substantial amount of information needed for a source water assessment, meaning these systems are among the likeliest candidates for expeditious completion of assessments.

(b) Completeness

Section 1453 requires states to complete their SWAPs no later than 2 years after program approval, or, with an approved time extension, up to no more than 3 ½ years after program approval. EPA defines that a state program is"complete" only when a state has completed all the actions in its EPA-approved SWAP and met all the requirements under sections 1453 and 1428(b) of the SDWA Amendments of 1996 (including the completion of source water assessments for all PWSs, and the release of the results of the assessments to the public). To gain EPA approval of its program, the state needs to include in its program submittal:

- A description of the level of exactness and detail that each assessment (or category of assessments) will achieve once it is considered by the state to have been "completed." A "completed" assessment for a PWS(s) must include:
  - A delineation of the source water protection area,
  - A contamination source inventory for that source water protection area, and
  - A determination of the PWS's susceptibility to contamination by sources inventoried within the source water protection area.
- A description of how each assessment will be "for the protection and benefit of the public water systems" in the state so that EPA can determine whether it does meet the goals of section 1453.

In regard to the latter requirement, EPA cannot properly evaluate whether a SWAP provides for the protection and benefit of PWSs unless the state describes the linkage of these assessments to ongoing or future SWP efforts. Thus, an approvable state SWAP submittal needs to describe such linkages, including whether the state plans to implement a SWP Program and how a SWAP will link with existing protection programs such as WHP programs under section 1428 (b). Several options for the SWP approaches are described in Chapter 3. EPA hopes to ensure the information gained through SWAPs will be directly used for protection actions. EPA, therefore, intends that this requirement for state submittals will prevent the waste or inefficient use of the DWSRF set-asides for source water assessments by ensuring their utility as intended by Congress and will ensure that clear goals for the use of the assessments will be described to the public for review during a state's process for SWAP development. This description may also be consistent with—and may assist in clarifying—plans for the DWSRF set-asides described in the state's IUP, and any work plan based on the IUP, as required under section 1452. SWAPs are intended to be supplemental and used to support existing and future SWP efforts, including WHP programs, which remain in force (under the SDWA Amendments of 1996).

(c) Differential Approaches

Significant funds have been made available through the DWSRF set-aside for the SWAPs. Many states have already undertaken considerable efforts through their WHP and watershed protection programs and through their state 305(b) reports to assess the quality of their source waters and the nature of the threats. Thus, EPA realizes that achieving the same level of exactness and detail in assessments for all PWSs is a significant undertaking that may not be possible with the funding provided and that may not be appropriate for the purposes of this assessment.

Therefore, EPA recommends that a state establish a strategic approach to its SWAP that will result in different levels of assessments (i.e., with different degrees of exactness for delineations and detail in inventories and susceptibility determinations) for individual or categories of PWSs.

Factors for Determining Approaches. There are several alternative approaches or factors that a state could employ separately or in combination:

- **Previous Assessment Efforts for PWSs.** Under WHP and Watershed Protection approaches, formal assessment efforts may have already been completed for many

PWSs. The state needs to determine which of these may have already met the goals of the SWAP and, therefore, would need little or no additional effort within the timeframe of their section 1453 SWAP.

- **Type and Extent of Threats.** States often have a good sense of the potential threats to many of the systems operating within their borders, even in the absence of formal assessments. For example, based on general information about the hydrology or hydrogeology and land use patterns influencing the source waters of a PWS, (e.g., information gathered for existing monitoring waiver programs, as well as available monitoring data), a state can make some preliminary decisions about which systems are threatened and which are not.

- **Type and Size of PWS.** Some states may target larger systems for more extensive assessments due to the greater population risks and desire to reduce these risks, whereas other states may target smaller systems for more extensive assessments due to these systems' lack of economies of scale and need for assistance in assessing and understanding the condition of their source waters.

- **Objectives for a Source Water Assessment.** Some states may desire to vary assessment efforts by the objectives they set for those systems. For example, a state may target some systems for comprehensive protection activities while other systems may be targeted for more focused protection from certain contaminants (e.g., microbial) or situations (e.g., spills). Further, some states may target certain systems for alternative monitoring or for maintaining filtration avoidances and conduct different levels of assessments for these systems than for others.

Examples of Approaches . There are many combinations of approaches that are approvable. The following are several illustrative examples of how states could differentiate assessments:

- For transient non-community systems, a state may decide to conduct assessments that identify sources of microbial and nitrate contamination only within a specified distance from the drinking water well, leaving more detailed assessment efforts for all

community water systems (CWSs) and the majority of non-transient non-community water systems (NCWSs).

- The state may know, based on information from, for example, a monitoring waiver program, of systems that are drawing from confined aquifers that produce water which is hundreds if not thousands of years old. A state could decide that assessments for these PWSs be very limited because the types of sources of contamination that could threaten these waters are very specific and few.

- For systems which are seeking benefits for their PWSs through regulatory flexibility (e.g., filtration avoidances), or that want to be equipped to do SWP, states may want to perform more detailed assessments that require an understanding of their complex hydrologic patterns and identify and analyze the nature of the threats from many sources of contamination.

While EPA recommends that states choose a differential approach, each state must have a coherent rationale for the approach it chooses (i.e., it must make sense for the state's specific situation). Also, to be approvable, the state submittal needs to explain that the approach to complete the assessments provides "for the protection and benefit of PWSs" in that state.

Process for Approaches. States may undertake differential approaches to assessments in many different ways. EPA recommends states consider one or both of the following processes:

- An iterative process whereby a state initially uses readily available data to do assessments for all systems. Then based on the results of these initial assessments, more detailed assessments are undertaken for those systems the state determines need more exactness, specificity, and thereby additional effort; and/or

- Similar to the iterative process, where one level of assessment is completed but then a more detailed effort follows, an interim assessment provides some initial information. The interim assessment is undertaken to provide a basis for some immediate benefit to a system(s) (e.g., a less costly monitoring or treatment alternative). However, a more comprehensive assessment would then be undertaken to meet the

requirements, including timeframes, of section 1453.

Conversely, the process that states use for collecting and analyzing data to guide decisions on monitoring or treatment alternatives may be equivalent to an interim Section 1453 assessment; or it is possible to consider these as complete Section 1453 assessments, **but only for those contaminants that have been adequately addressed by the state's analysis and in accordance with this guidance**.

Coordination Using the Approaches. A state's differential approach to assessments can provide the blueprint for making the state's efforts for coordination the most cost-effective possible. The state can align specific federal/state programs to specific elements of its differential approach. For example, the state may know that the majority of transient NCWSs are operated by state and federal land stewardship agencies such as forest and park land agencies; the state SWAP could enter into a memorandum of understanding with these other agencies and programs to accomplish the type of assessments targeted for these systems.

Similarly, an iterative process could point to a particular strategy for coordination. In fact, EPA recommends that, for an initial assessment, a state coordinate with federal agencies, other states, other countries, and tribes to gather and review all existing data available at the state level. With a completion of this initial assessment, the state's coordination efforts would focus on supporting and/or working closely with local stakeholders.

Table 2
State's Strategic Approach:
Key Issues for Advisory Committee(s)

1.	Has the state done an initial review of all data sources available and determined the scope of the need for additional information?
2.	What level of exactness/detail should be achieved by each assessment to be considered "complete?"
3.	Should the level of assessment provide for the protection and/or benefit of the public water supply(s)?
4.	What should be the basis for differential levels of assessments to be completed for different public water supplies or categories of public water supplies? System type or size? Preliminary information about the existence of threats? Other?
5.	How will the state SWAP be coordinated among various environmental and other state programs (e.g., PWSS, water quality, water resources, agriculture, land use, information management, geologic)?
6.	How would the state's assessment program lead to state watershed approaches and link to wellhead and other protection programs?

3. Requirements/Options for Delineations, Source Inventories and Susceptibility Determinations

Each source water assessment for a public water supply(s) must include three elements: a delineation of the source water protection area; an inventory of significant potential sources of contamination within that area; and a determination of the susceptibility of the public water supply(s) to the sources inventoried. These assessments can be done on an "area-wide" basis involving more than one PWS. The following describes what EPA believes these efforts require and what the state needs to include in its program submittal to meet the intent and requirements of section 1453 and thereby gain Agency approval. A state may put forth an alternative to what EPA believes these efforts require, provided the state demonstrates that the alternative meets the same functional objectives.

(a) Delineation of Source Water Protection Areas

Ground Water Systems. For PWSs relying on ground water, the state program submittal needs to indicate that the delineation of source water protection areas will be in accordance with accepted methods under the WHP Program of section 1428 of the SDWA as described in EPA's publication titled *Guidelines for Delineation of Wellhead Protection Areas*, published in June, 1987. Where a state has an EPA-approved WHP Program, a state may continue with the delineation approach established by that program. However, whether the state has an approved WHP Program or not, it may adopt the delineation approach employed by another state's EPA-approved WHP Program for the hydrogeologic settings common to both states. EPA recommends that, in either case, a state consider modifying the WHP Program approach, where necessary, to take advantage of the regulatory flexibility to be offered to states and PWSs in the future under rules such as the Ground Water Disinfection Rule (GWDR). (See Chapter 4.)

There are situations for ground water systems where states need to delineate assessment areas outside of, and in addition to, the typical wellhead protection areas (WHPAs). In cases where a protection area contiguous to the well or wellfield would alone be inadequate to provide for the protection and benefit of the PWS, states need to delineate recharge areas that are not adjacent to or surrounding the well.

Surface Water Systems. For PWSs relying on surface waters, the state program submittal needs to adopt a policy that sets the delineation of the source water protection area to include the entire watershed area upstream of the PWS's intake structure (see Figure 1), up to the boundary of the state borders. In other words, the delineation of the source water

protection area for these public water supplies would be the topographic boundary, up to the state's border, that is the perimeter of the catchment basin that provides water to the intake structure. EPA recommends that states use the United States Geological Survey (USGS) hydrologic unit codes (HUC) to the extent appropriate. Where water is diverted into this area from another watershed(s), the watershed area(s) upstream of each diversion structure would also need to be delineated in a similar manner. EPA strongly encourages states to include in the delineated area those parts of a watershed that are outside its boundaries and will assist the states with any of this work if requested.

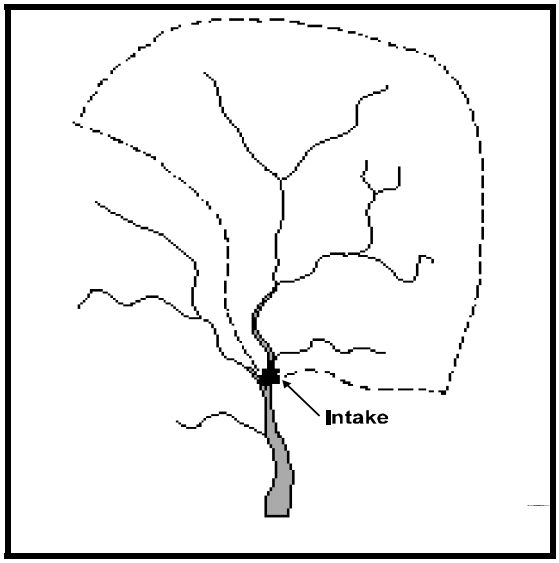


Figure 2 A Watershed Area

As described below, for the purposes of undertaking an inventory of significant potential contamination sources and determining susceptibility of the public water supply, the state can choose to segment the delineated watershed area(s) (see Figure 2) into units (e.g., stream segments, buffer zones, sub-watershed areas) for more cost-effective analysis. EPA strongly recommends that states work with upstream neighboring states or nations to gain assessment information on watershed areas that would normally be part of a source water protection area for a PWS except for its location outside of the state's borders. EPA also recommends that states coordinate assessments so they are consistent within a watershed area that crosses borders. (See section II.B.4 of this chapter.)

Ground Water/Surface Water Interface. EPA recommends that states consider the impacts of ground water on surface water when delineating source water protection areas for PWSs based mostly on surface water. The source water protection areas may include surface water contribution areas and zones of ground water contribution to public surface water supplies. The consideration of surface water contribution areas and zones of ground water contribution during the delineation process is termed "conjunctive delineation." (See Appendix D for further discussion.)

EPA also recommends that States consider the impacts of surface water on public water wells when delineating certain PWSs based mostly on ground water but in the vicinity of a body of surface water. These source water protection areas may include surface water contribution areas in addition to the zones of ground water contribution to the PWS. This is important because the pumping of wells in the vicinity of surface water may induce infiltration of the surface water into the ground water and subsequently into the pumping well. (See Appendix D for further discussion.)

(b) Source Inventories within Delineated Source Water Protection Areas

The state program submittal needs to indicate what "contaminants of concern" its SWAP will address and what "significant potential sources" of these contaminants the program will inventory in assessment efforts.

Contaminants of Concern. The contaminants of concern must include those raw water contaminants regulated under the SDWA (contaminants with a maximum contaminant level (MCL), contaminants regulated under the SWTR, and the microorganism *Cryptosporidium*.) This includes *Cryptosporidium* because EPA is in the process of regulating this microorganism. EPA published a proposed Enhanced Surface Water Treatment Rule, which included adding *Cryptosporidium* as a regulated contaminant, on July 29, 1994 (54 Fed. Reg. 38832), and is required to promulgate the final rule by November 1998, pursuant to SDWA section 1412(b)(2)(C). EPA agrees with the recommendation the Agency received through a Federal Advisory Committee Act process that the final rule should contain a removal requirement for *Cryptosporidium*. Therefore, by the deadline for state SWAP submittals, *Cryptosporidium* will be a regulated contaminant.

In addition, states may include those contaminants that are not federally-regulated under SDWA but which the state has determined may present a threat to public health. In particular, in light of the expectation that other microbiological contaminants (e.g., pathogenic viruses and bacteria) will be addressed under the GWDR, EPA recommends that states inventory the sources of these microorganisms in the context of their assessment approach.

Significant Potential Sources. A state program submittal also needs to indicate what types of potential sources of the contaminants of concern will be considered "significant" and, therefore, inventoried in the assessments. The inventory needs to include a clear description of the sources of

contamination (or categories of sources) by location either specific or by area (this could be locational coordinates to assist in mapping). As a starting point, Appendix E lists the types of potential contamination sources for both ground and surface waters. Potential sources include Superfund sites, TRI sites, National Pollutant Discharge Elimination System (NPDES) permittees, underground storage tanks (USTs), RCRA sites, and others included in public databases, as well as anticipated future sources and NPSs.

To gain Agency approval, a state needs to choose and describe in its submittal one or both of the following two approaches for determining which types of potential sources of contamination are significant:

- Define a significant potential source of contamination as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants of concern and has a sufficient likelihood of releasing such contaminants to the environment at levels that could contribute significantly to the concentration of these contaminants in the source waters of the public water supply(s); or

- Describe how an initial susceptibility determination for the PWS(s) will result in identifying the types of significant potential sources that will be inventoried.

The first approach relies on the inherent characteristics of the potential contamination sources (i.e., the amounts produced, stored or used, the likelihood of release including existence of mitigation efforts, etc.). All sources of contamination in the source water protection area that meet the thresholds for these factors are identified as significant potential sources once the presence of these significant potential sources in the source water protection area is identified. The state makes a determination as to the susceptibility of the water system(s) to these sources. This stepwise approach could be rather burdensome, except for small source water protection areas (i.e., WHPAs). For these, this approach may, in some cases, actually provide an "automatic" susceptibility determination, for the exact location of the significant potential contamination sources within small WHPAs would be irrelevant, assuming there is constant hydrogeology, (i.e., given the small size of the source water protection area, the PWS would be susceptible to any significant source located in the area).

The second approach utilizes existing information and initial determinations of the susceptibility of a PWS(s) to identify

what potential sources would be significant if located in the source water protection area. This approach is likely to be more useful for assessments for PWSs in large source water protection areas. In particular, EPA recommends that a state segment large surface water source water protection areas into smaller areas and determine what types of potential sources would be significant, given the susceptibility of PWSs for each such segmented area. (See Figure 2.) For segments close to the intake structure, most types of contamination sources may be found to be significant. Whereas for remote segments, most, and in some cases perhaps all, types of potential sources may be determined insignificant. This approach allows the state to focus the actual source inventory effort on those types of contamination sources that are considered to be significant in each segment.

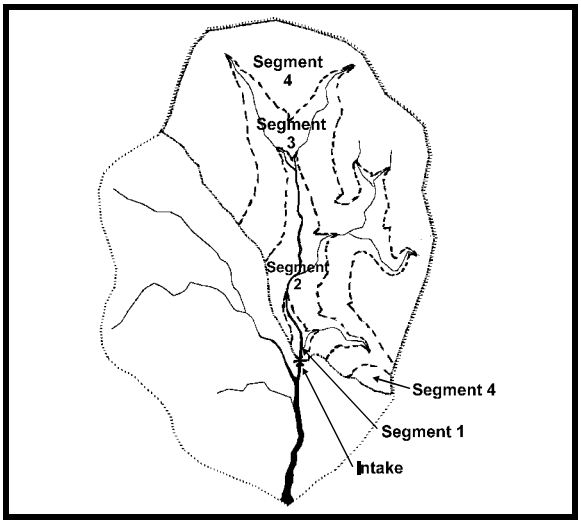


Figure 3 Watershed Area—Segmented for Assessments

The approach EPA recommends assumes broad initial inventories, with a narrowing and iterative focus based on protection goals and better information. As the analysis for any source water protection area becomes more detailed, a state may want the inventory to be very specific so that protection actions can focus on specific facilities or areas within a source water protection area. Thus, if a state determines it will enhance SWP actions yet not discourage voluntary implementation of protection measures, a state may:

- For point sources: identify the names and addresses of these sources of contamination.

- For NPSs: identify the geographic area where the NPSs are located.

Compliance with federal, state, or local statutes by a facility or activity that is a potential source of contamination does not necessarily mean that a PWS is not susceptible to that source. Existing controls and management measures that are determined by states to be effective may be an appropriate screen for susceptibility for some potential sources.

EPA recognizes that completion of these inventories can be resource intensive. The Agency recommends that states set up community volunteer programs under state or other appropriate quality supervision,

which can adopt lower-cost methods to locate potential sources of contamination (e.g., using hand-held global positioning units). EPA recommends credible groups within each source water protection area do some of the work for the inventories, such as the elderly through RSVP programs or younger people such as the Boy Scouts or Girl Scouts or 4H Club members.

(c) Determination of Public Water Supply(s) Susceptibility

The state program submittal needs to describe the state's definition of a "susceptibility determination" and how it will be achieved through the SWAP effort. A state may define "susceptibility determination" as the potential for a PWS(s) to draw water contaminated by inventoried sources at concentrations that would pose concern. Such a determination, therefore, would likely take into account hydrologic and hydrogeologic factors, inherent characteristics of the contaminants (e.g., toxicity, environmental fate and transport); and characteristics of the potential source of the contaminant (location, likelihood of release, effectiveness of mitigation measures). States should note that in small source water protection areas, where differences in distances between sources and the intake are small, and hydrologic and hydrogeologic factors are relatively constant, susceptibility of a water supply is related to the likelihood of a significant release and to the inherent characteristics of the source (e.g., toxicity, fate and transport, etc.). (Appendix F provides more detail on possible factors to be considered.)

The state submittal also needs to describe how the results of the susceptibility analysis will either be: an absolute measure of the potential for contamination of the public water supply; a relative comparison between sources within the source water protection area; a relative comparison to findings by other assessments; or some other result that would provide for the protection and benefit of the PWSs.

A susceptibility determination does not necessarily require modeling or monitoring in the source waters to determine which potential sources of contamination are significant. Nonetheless, EPA encourages states to undertake such modeling and monitoring, taking advantage of other resources for these activities than those available through the DWSRF, where necessary to provide a basis for good source management measures.

By including the language in section 1453(a)(2)(B) "to determine the susceptibility of the public water systems in the delineated area," to the identified contaminants, Congress decided that an analysis of a PWS's susceptibility to

potential sources of contamination will be the means for a state to make the inventory useful for decisions regarding source water protection programs and other possible uses. The legislative history further indicates that a SWAP is intended to include an analysis of potential threats to PWSs from the inventoried sources. In describing the link between the information in the assessments and source water protection programs, the House Committee on Commerce report described such programs as ***"designed to protect source water from threats identified during the assessment"*** (emphasis added). Simply identifying the numerous significant potential sources of contamination does not in itself determine which of them may or may not present threats to drinking water, or, which are priorities to manage in order to protect drinking water. A scientific analysis of the hydrogeology and/or hydrology, an understanding of the contaminants, and an analysis of the effectiveness of existing prevention and mitigation measures are essential so states can credibly apply the assessment results to SWP and monitoring and other regulatory flexibility, as Congress intended. An analysis of the risks from these sources, described as a determination of "susceptibility" in section 1453 (a)(2)(B), is therefore a required part of each SWAP, and thereby for each assessment in a source water protection area. The level of detail, however, from any assessment, will depend upon the state's SWAP program approach.

Table 3
Delineation, Source Inventory, and Susceptibility: Key Questions for the Advisory Committee(s)

1.	What delineation method and criteria will be used for systems using ground waters? Where shall recharge areas not be included and why?
2.	What contaminants that are not currently regulated by EPA should be part of the state's SWAP program?
3.	Should the state segment source water protection areas for more focused source inventories? What should be the basis for such segmentation?
4.	How should the state define and identify significant potential contamination sources and how should the state undertake their inventory within source water protection areas?
5.	How will the results of the susceptibility analysis be characterized?

4. Adequate Assessment(s) for Waters Which Cross State or Country Borders, Boundary Rivers, Multi-State Rivers and the Great Lakes and EPA's Role in Assisting States Accomplish These Assessments

(a) Role of the State

Unless a state can demonstrate that an alternative meets the same functional objectives, a state SWAP submittal needs to contain the following:

- A description of how the state will delineate source water protection areas, conduct an inventory of contamination sources, and conduct a susceptibility determination for that portion of a boundary river, the Great Lakes, or multi-state river that is within its borders (using the segmented approach in section II.B.3.a).

- A description of how the state will make the maximum practical effort to coordinate with other states, tribes, or nations to do assessments, particularly for categories of significant potential sources of contamination in upstream states.

While not an assessment technique, and therefore optional, states may describe in their submittal the contingency planning policy they have for these water bodies in case of spills or other emergencies.

States may want to describe any multi-state agreements or organizations in which they participate or which may be established to create protection and contingency plans. States should encourage consortiums across state lines of water suppliers, dischargers, and other affected parties to develop contingency plans and communication networks in the case of spills and other emergencies. For example, Pennsylvania, Ohio, Kentucky, and West Virginia could describe how they cooperate with each other through the Ohio River Valley Water and Sanitation Commission (ORSANCO).

States should also consult closely with local stakeholders across state borders (particularly water suppliers, watershed associations, ground water protection teams, and governments) to get their perspective on the scope, focus, and level of effort that would be necessary to achieve the best assessments.

(b) Role of EPA

EPA, working through the Regions, will strongly encourage cooperation among states to accomplish compatible and complementary source water assessments in a watershed that includes several states or countries. Many states already participate in multi-state organizations for protecting rivers or lakes that cross state boundaries. While these efforts are voluntary on the part of the states, when requested by the states, EPA will facilitate discussions and provide regional assistance.

Table 4
Boundary Waters, Multi-State Rivers, and the Great Lakes: Key Issues for Advisory Committee(s)

1.	What agreement should the state maintain or initiate with other states, tribes, or nations to gain more complete and consistent source water assessments?
2.	What contingency plans should be pursued?
3.	What coordination/facilitation activities should the state request of EPA?
4.	Are compatible and complimentary assessments being done in watersheds shared with other states and countries?

C. Requirements/Options for Making Assessments Available to the Public

The statute at section 1453(a)(7) requires that states "make the results of the source water assessments conducted under this subsection available to the public."

The following describes what EPA believes this statute requires and what a state needs to include in its program submittal to meet the intent and requirements of section 1453 and thereby gain Agency approval. A state may put forth an alternative to what EPA believes these efforts require, provided the state demonstrates the alternative meets the same functional objectives.

1. Content of Understandable Assessments— Mapping Assessment Information, Listings of Sources and Narrative Assessment Reports Made Available to the Public

The results of the assessment reflect the state's analysis of the susceptibility of the PWS(s) in a source water protection area to the inventoried sources of contamination. For a program to be approvable, a state needs to make these results available in an understandable manner and in an expeditious way after they are complete. In addition, as a matter of proper accountability for the results of a process reached using DWSRF funds, a state needs to make available all information collected during each assessment, when requested. Further, a state needs to create maps as part of the results, and those maps need to include the delineated area and the sources of contamination described in the inventory.

The susceptibility determinations most usable by the public could be in a narrative form, but may be presented on a map if the results of the analysis would be more understandable in that format. Furthermore, EPA recommends that maps be created through a Geographic Information System (GIS), but topographic formats may also be used.

EPA recommends that states determine the appropriate scale of such maps, and therefore, the locational detail. For example, a map may need to identify individual USTs to help target resources for pulling tanks or taking other prevention actions. The scale needs to be as detailed as necessary to make the assessment provide for the protection and benefit of the public water supplies.

USGS can supply GIS coverages of waters within and across state boundaries and EPA can supply coverages of Reach File 3, that show the location and "address" of surface waters in the country to a 1:100,000 scale. (Reach File 3 is described in chapter 5.)

2. Procedures for Making Assessments Available to the Public

For an approvable SWAP submittal, a state must describe how it will ensure that the results of the assessments are made available to the public, either directly or through a delegated entity, in an expeditious manner after the results are done. A state's description may include approaches from below, but must include some reasonable and effective array of means to ensure results will be made widely available.

The public is defined as all consumers in a source water protection area as well as all other members of the public, including federal, state and local government agencies. To the extent that a watershed area or recharge area crosses state boundaries, EPA recommends that the contiguous (or other) states make the maximum practicable effort to provide consistent information to all members of the public in such a source water protection area.

To demonstrate that it has met the requirements for making the results of each assessment available, EPA recommends that a state:

- Create a brief report, understandable to the public, in an expeditious manner after the assessment is finished.

- Make the report widely available via the internet and other means.

- Provide widespread notification of availability (such as through bill stuffers) describing in detail how the public can obtain a hard copy (using state rules for charging for copies).

- Permit the public to request a copy through postage free return mail

cards, a free call-in number, and internet posting.

EPA encourages states to make the assessments widely available by linking the results to the Agency's "Surf Your Watershed" internet effort, the Index of Watershed Indicators (IWI), state 305(b) waterbody delineation and assessment efforts, and with the Reach File 3 System. (See further description in Chapter 5.) Of key importance for such data integration is the accurate identification of locational coordinates for public water supply wells and intakes, and inventoried significant potential sources of contamination. Other options include:

- Send copies of the assessment or a summary to the public through access to either a telephone or on-line computer system. States could use existing or new information lines or information phone numbers of community water supplies.

- Send a notice or results of each assessment to each customer in his or her water bill advising consumers annually (or in some other timeframe) about how to attain a copy or view completed assessments. Such a procedure would advise all customers that the report exists and how it can be obtained.

  The notice could be sent to each customer as part of a utility's consumer confidence report. These reports are required annually and may be the most efficient method to send either the assessment or the results of the assessment, or announce the availability of the assessment. This often could extend beyond, but will, at a minimum, have to comply with the regulations that will be published under section 1414 (c)(4) of the SDWA (as amended in 1996).

- Establish an active outreach process to make sure each household in the delineated area knows about the assessment report's availability and how to access it easily. This effort could include a PWS newsletter, or flyer to each household. The local communities affected could advertise the availability of the assessment in a local newspaper. Communities encompassing PWSs could advertize its availability on radio or on local cable televisions as well as on local government internet home pages.

- Develop a statewide database of assessments and have them accessible through a homepage with possible links to other ground water and watershed databases. Such a database could become part of EPA's IWI through the "Surf Your Watershed" internet system. EPA will provide technical assistance if a state wishes to use "Surf Your Watershed" and thereby avoid creating its own internet program.

- Briefly summarize the assessments from a statewide perspective and note the availability of the assessments in the state CWA section 305 (b) reports. These reports are available to the public, and the availability of the assessments and how to obtain them could be easily described in one of the sections of the state report.

Table 5
Making the Results of Assessments Available to the Public: Key Issues for Advisory Committee(s)

1.	What should be included in the results of the assessments, what should be the format of an understandable report on results, and when should the results be made available?
2.	How and when should the state make available all the information collected during each assessment when someone requests it?
3.	What type of maps should be developed to display the results of the assessments?
4.	How and when should the state make public all information collected during each assessment for a PWS(s)?
5.	How should the state or delegated entities provide wide notification of the availability of the results and other information collected?

D. Requirements/Options for State Program Implementation

Section 1453 requires EPA to approve or disapprove a state SWAP submittal. Therefore, EPA needs to assess not only the policies and approach proposed by the state but also the likelihood that such an approach will be successfully carried out (i.e., whether the proposed program is feasible and viable). The following describes what states will need to include in their program submittal regarding implementation to meet the goals and explicit requirements of section 1453. A state can put forth a different determination as to what is required to gain EPA approval, but the state needs to

demonstrate that the alternative meets the same functional objectives.

1. Timetables

In an approvable submittal, a state needs to propose a timetable for implementing and completing assessments within the state. A "completed state SWAP" and a "complete local assessment" are defined in section II.B.2.a.

The proposed timetable in the submittal must be no more than 2 years after EPA approves a state program. However, the statute at 1453(b) allows EPA to grant a state's request for an extension of the time available for completion of assessments up to 18 months after the original 2-year period. Thus, statewide completion of the assessments could be a maximum of 3 ½ years from initial EPA approval of a state's program. States that are continuing to implement WHP Programs and have been accomplishing assessment-type work in local watershed efforts, will, in effect, be implementing assessments over a 6 3/4 year period from the date of enactment which was August 6, 1996.

To be approvable, requests for an extension to complete a state SWAP must be made based on:

- Consideration of the availability to the state of funds under the DWSRF under section 1452 of the Act. That is, based on its approved program, a state must show that additional time is needed to complete the assessments based on an analysis of how much DWSRF funding it is spending to do the assessments. For this reason, EPA encourages states to determine how much it would cost to complete the assessments for their source water protection areas, and then take up to the full 10 percent allowed from the FY 1997 allotment. States can apply for these funds in FY 1997 or FY 1998.

- Consideration of other relevant factors, for example, statewide or sub-state emergencies such as natural disasters.

For the initial program submittal, a state can provide a rationale for the eventual extension of the timeframe and base its submitted timeframes and priorities on the extended deadline. If a state requests an extension as part of its initial submittal, EPA will make a determination of the timeframe extension as part of the approval of the state's program.

2. Resources to be Committed to the Effort

To be approvable, a state needs to explain how it will complete assessments as described in its SWAP using resources the state proposes to allocate.

(a) Funding from Drinking Water State Revolving Fund

For complete discussion of the Agency's DWSRF policies, the reader may refer to EPA's *Drinking Water State Revolving Fund Program Guidelines* released on February 28, 1997, which is available by calling the Drinking Water Hotline (1-800-426-4791).

A state may set aside up to 10 percent of its allotment under section 1452 for assessments for PWSs in accordance with section 1453 of the 1996 SDWA amendments. Unlike other SWP activities eligible for DWSRF assistance, funds for delineations and assessments under section 1453 programs are only available from the FY 1997 capitalization grant. For this reason, EPA encourages states to determine how much it would cost to do complete assessments for their source water protection areas, and then take the amount necessary up to the full 10 percent allowed from the FY 1997 allotment. States can apply for these funds in FY 1997 or FY 1998. Funds set-aside for this purpose must be obligated within four fiscal years after a state receives its grant. Part IV of this chapter provides more discussion of the DWSRF policies for SWAP.

(b) Other Financing Options

Aside from the DWSRF, other potential sources of financial support for source water assessments exist. A limited portion of the section 319 grants and of the CWSRF may potentially provide support to states for assessment and protection of source waters from NPSs of pollution. The most recent section 319 grants and program guidance specifies that 319 grants can be used to support SWP activities, including assessments. States will continue to be eligible to use CWA section 106 funds for WHP activities, which may include source water assessments.

3. Delegations of Efforts

If a state will delegate some of the aspects of assessments, the submittal needs to include a description of how, to whom, and what aspects of assessments the state will delegate, and a formal definition of delegation used in regulations, guidance, in another formal state policy, or created for this program. The state submittal also needs to include a description of the financial capacity of the entity or entities who will be performing delegated aspects

of the assessments to undertake such aspects successfully. States and delegated entities may involve any other appropriate groups allowable under state law to do the assessments. EPA recommends that if local entities will, in fact, conduct some aspects of assessments, that appropriate stakeholders participate in the assessments. States have discretion to decide if funding under section 1452(k)(1)(C) will accompany state delegation. However, EPA encourages states to do so because providing funding where necessary for delegated assessment activities can ensure effective completion of the state's approved SWAP. EPA believes that Congress expected the assessment set-aside funds would be sufficient for assessment functions.

4. Role and Coordination of State Agencies and with Other Federal/State/Tribal Programs

In order for EPA to evaluate whether a state will be able to meet the timetable for completing assessments set forth in a SWAP submittal, a state needs to explain in the submittal how it will coordinate with:

- State environmental programs;
- Tribes;
- Local stakeholders;
- Other states (as described in section II.B.4);
- Federal agencies.

State drinking water programs do not have the resources nor the databases necessarily to adequately accomplish the assessments alone. The assessments will have to be a team effort at the state level assisted by local stakeholders and federal agencies. EPA recommends that states briefly describe coordination in their submittals to ensure this coordination will take place.

5. Reporting of Program Progress

For EPA to know whether a state will be meeting the goals of section 1453 and accomplishing the state's program objectives and approach, a state submittal needs to describe how it will periodically report to EPA on progress of the effort. (See Final DWSRF guidelines for reporting requirements. Essentially, states are required to describe how funds have been expended, using the set-aside funds for assessments in the required biennial reports.)

For EPA to determine whether a state using funds under section 1452(k)(1)(C) is moving towards completion of its SWAP program, these states need to report to EPA:

- The total number of PWSs, categorized as ground water, surface water, or combined (this should be consistent with Safe Drinking Water Information System (SDWIS) reporting).

- The number PWSs by category with "completed" delineations, source inventories, and susceptibility determinations.

- The population served by the PWSs in source water protection areas.

- How completed local assessments have been made available to the public.

States can use current reports or a separate report to EPA as the mechanism for providing information on SWAPs. For example, states can use their WHP Program biennial reports to report on completed programs for ground water, surface water, and combined systems.

6. Updating the Assessments

Some of the key benefits possibly available to PWSs with adequate assessments will be regulatory flexibility under existing as well as future rules such as the CMR, alternative monitoring, and GWDR. For EPA to understand how the state program will continue to provide benefit to PWSs, EPA recommends the state present as part of its submittal a plan to update the assessments, particularly if the state decides not to modify the scope of its previous ground water delineation approach in anticipation of its systems' needs under forthcoming rules providing for flexibility. (See section II.B.3.(a) of this chapter.) This could include a brief description of the process it plans to use to update the assessments to incorporate the newly regulated contaminants and rules expected to be promulgated by EPA (described in Chapter 4) during the time period when the state is completing the assessments under its approved SWAP program. These rules include:

- Ground Water Disinfection Rule

- Chemical Monitoring Reform Rule and Alternative Monitoring Rule

- Underground Injection Class V Rule

- Enhanced Surface Water Treatment Rule

EPA notes that states will need to have periodically updated assessment-type information in order to make adequately informed decisions in the future on such matters as monitoring flexibility. EPA further recommends that states update assessments to include new active and

current PWSs, and new wells/intakes identified by the state in its reporting to EPA under the previous regulations. Also states should update the assessments for other purposes such as new changes in land use that could, if not identified, hinder protection of PWSs.

Table 6
State Program Implementation:
Key Issues for Advisory Committee(s)

1.	What should be the timetable for state SWAP program implementation?
2.	How much should the state spend on SWAP program development and implementation, and should the resources come from the DWSRF and/or other resources?
3.	Should the state delegate aspects of the assessments? If so, to whom? Should funding be provided to delegated entities?
4.	How should state agencies coordinate with each other and with other state, federal, and local stakeholders when implementing SWAPs?
5.	How and what should the state report to EPA regarding SWAP implementation?
6.	When and how should the state update assessments?

III. PROGRAM SUBMITTAL PROCESS

A. Process for Submitting the State Source Water Assessment Program and for Program Implementation

1. Statutory Requirements

The statute at section 1453(a)(3) requires that "a state source water assessment program under this subsection shall be submitted to the Administrator within 18 months after the Administrator's guidance is issued under this subsection and shall be deemed approved 9 months after the date of such submittal unless the Administrator disapproves the program as provided in section 1428(c). States shall begin implementation of the program immediately after its approval. The Administrator's approval of a state program under this subsection shall include a timetable, established in consultation with the state, allowing not more than 2 years for completion after approval of the program."

The statute at section 1453 (a) (4) states that the timetable referred to in paragraph (a)(3) must "take into consideration the availability to the state of funds under section 1452 (relating to state loan funds) for assessments and other relevant factors. The Administrator may extend any

timetable included in a state program approved under paragraph (3) to extend the period for completion by an additional 18 months."

B. Outline of the Process For Submitting and Implementing a Program (See Appendix B)

Based on the statutory requirements at sections 1453 (a)(3) and 1428 (c)(1), there are three separate and distinct phases for establishing state SWAPs:

Requirements for Program Submittal . States must submit SWAPs to the appropriate EPA Regional Administrator by February 1999. The states must develop programs with public participation, as defined in section II.A.

Approval Process for Submittals. EPA must approve or disapprove a state program within 9-months after submittal. If there is no EPA action in the 9-month period, a state program will be deemed approved. When approving a program, the Regional Administrator must include a timetable, established in consultation with each state, for completion of the program. States must begin implementation immediately upon approval. A state must complete program implementation within 2 years of approval unless an extension is granted. Requirements for extensions are described in section II.D.1.

Disapproval Process for Submittals. If the Regional Administrator determines a program (or portion thereof) is to be disapproved, EPA must send a written statement of the reasons for such disapproval to the Governor of the state.

- Within 6 months of EPA's written statement to the Governor, the Governor or Governor's designee must submit a modified program to EPA. These state modifications to the program submittal must be based upon the recommendations of the EPA. If EPA disapproves the program (or portion thereof) in the 9-month period, EPA will negotiate with the state in an expeditious manner to ensure that the state has an opportunity to develop an approvable program.

- EPA must then make a decision on whether to approve or disapprove a state's re-submittal.

IV. THE DRINKING WATER STATE REVOLVING FUND AND SOURCE WATER ASSESSMENTS

A. The Intended Use Plan: The Key Funding Vehicle

Consistent with EPA's Guidelines for implementing the DWSRF, the central

component of the capitalization grant application is the IUP. The IUP describes how a state intends to use available DWSRF funds to meet the objectives of the SDWA and further the goal of protecting public health. A state must prepare the IUP, and after providing for public review and comment, submit it to the Regional Administrator as part of its capitalization grant application. The IUP must include specific details on how a state will use all funds in its capitalization grant, including funds it will allocate for the set-asides.

States have the option of developing the IUP in two parts, one part that identifies the distribution and uses of the funds among the various set-asides and the DWSRF, and the other part dealing only with project funding in the DWSRF. A state may submit a capitalization grant application for only the funds it intends to allocate among the set-asides. This option provides states with a great opportunity for expediting the process for receiving those funds. As with all grant applications, the state would have to include a detailed description (workplan) of the assessment activities to be funded under the set-aside.

B. The Importance of Funding Source Water Assessment Programs

EPA will ask states that indicate in their IUP that they do not intend to set aside the full 10 percent for assessments if they have considered their source water assessment needs in the light of the limited time frame for the availability of funds for that purpose. Assessments are particularly important as the foundation of effective SWP programs; without them, further progress in protecting source waters from contamination in an efficient and effective way is very difficult. Assessments are necessary components of WHP Programs and SMPs for pesticides and they will play key roles in providing regulatory flexibility under a number of existing and future federal drinking water protection rules. In addition, the information obtained through assessments will be critical in targeting source water areas for protection by other federal and state programs, including UIC Class V programs, USDA's Farm Bill programs, NPS programs, and watershed protection programs.

C. Work Plans, Financing, and Implementing Assessments <u>Prior</u> to EPA Approval of State Source Water Assessment Programs

States may use the DWSRF 10 percent set-aside funds for assessments <u>prior</u> to receiving EPA approval for a SWAP Program submittal under the following conditions:

- The state must have an EPA-approved WHP Program under section 1428 of the SDWA before using the funds to conduct assessments for systems dependent on ground water; or if the state does not have an approved wellhead program, the delineations and assessments for systems dependent on ground water must be conducted in accordance with any approved state program's delineation policy and process or the EPA's June 1987 guidance, *Guidelines for Delineations of Wellhead Protection Areas*, and the state's approach for assessments must receive interim approval by EPA as part of the Agency's review of the state's DWSRF set-aside work plans; and

- For systems dependent on surface water, the state's approach for assessments must be described, and receive interim approval by EPA, consistent with this guidance, as part of the DWSRF set-aside work plans.

In those states where DWSRF set-aside funds are used for assessments prior to having an approved SWAP program submittal, EPA will review on an annual basis these expenditures, as well as the approach used by the state to conduct the assessments.

In order for EPA to provide an interim approval of a state's approach for assessments as part of the Agency's review of the state's DWSRF workplan, the workplan must include:

- A description of the state's approach to assessment consistent with the language of Chapter 2, section II.B in this document.

- A description of exactly what aspects of the assessments the set-aside funds will be used for prior to approval of a state's SWAP.

- A timeframe for when the state will submit the SWAP to EPA for approval.

If EPA finds any of these descriptions substantially inconsistent with this guidance, EPA will disapprove the state's approach to assessments and the state will not be permitted to use the set-aside funds until such time as the state makes necessary changes to the workplan to meet EPA's objections or receives approval of its SWAP.

D. DWSRF Funding for Programs Supporting State Source Water Assessment Programs

Congress encouraged the use of other existing programs and efforts that provide information that could be used for source water assessments, as indicated in section 1453(a)(6)(E) of the Amendments: "to avoid duplication and to encourage efficiency, the (Source Water Assessment) program . . . may make use of . . . delineations or assessments of surface or ground water sources under programs or plans pursuant to the Federal Water Pollution Control Act." This intent is also reflected clearly on page 64 of the Senate Environment and Public Works Committee report (S. Report 104-169) on the 1996 amendments: "states are strongly encouraged to use existing assessment data gathered under other state and federal programs and guidance developed by EPA under other federal laws."

1. Total Maximum Daily Load Program

One example of an existing program that can provide useful information for source water assessments is the TMDL program under the CWA. A TMDL is designed to show how much pollution needs to be reduced by individual sources in a watershed. A TMDL is a quantitative assessment of water quality problems and contributing pollutant sources and provides the information needed to specify the amount of a pollutant that needs to be reduced by individual sources so that lakes, rivers, streams, or estuaries meet state water quality standards and designated water uses. A TMDL quantifies the pollution to be controlled from permitted point source discharges as well as NPSs such as storm water runoff. EPA encourages states to use relevant information from existing TMDL programs to help complete source water delineations and assessments.

A question that arises is whether states can use a portion of the DWSRF allocation for source water assessments to develop a TMDL. EPA's February 1997 *DWSRF Program Guidelines* state that:

"States may use funds from this set-aside (note: the 10 percent set-aside for source water assessments in accordance with section 1453 of the SDWA) for the development of TMDLs in limited circumstances. The state must establish a policy of allowing use of the set-aside funds to develop TMDLs only if a clear cause and effect relationship can demonstrate that development of the TMDL is essential to public health protection and continuing compliance with national primary drinking water regulations. Funding TMDLs through source water set-asides is only eligible if it

will prevent or reduce source water contamination or enhance the efficiency of the drinking water treatment process. In this context, TMDL activity may be weighed against other source water assessment and delineation priority activities. State SWAPs submitted to EPA that propose to include TMDL activity must ensure that the development of TMDLs does not delay the completion of the source water assessments."

Consistent with these constraints, there are numerous scenarios under which TMDL development would be eligible to be funded under the 10 percent set-aside for Fiscal Year 1997 DWSRF appropriations. To promote the continued integration of public health goals into CWA programs, and to encourage efficiency as envisioned by Congress, EPA encourages states to use up to 10 percent of the 10 percent set-aside to develop TMDLs for source water areas as long as the TMDL assessment satisfies the following criteria: (1) there is a direct linkage between contaminant(s) and/or sources in the TMDL assessment and public health; (2) the contaminant(s) in the TMDL assessment are those that are regulated under the SDWA; (3) the TMDL assessment will assist a PWS(s) achieve or maintain compliance with a National Primary Drinking Water Regulation; and (4) the TMDL performs one or more of the three functions required of a state SWAP (i.e., delineation, source inventory and/or susceptibility determinations).

In a limited number of cases, states may find that a greater portion than 10 percent of the 10 percent set-aside may be used for TMDL development to improve either the quality and/or efficiency of their SWAPs. States have this discretion, although they must demonstrate clear reasons, consistent with the above criteria, for allocations greater than the 10 percent threshold recommended by this guidance in their bi-annual reports to EPA on the DWSRF program. Again, any funding for TMDLs may be linked to their intended use as platforms for SWP activities directly related to public health protection and compliance with drinking water regulations.

2. Monitoring/Modeling Activities

As described in section II.B.3.(c), a source water assessment should not ordinarily require modeling or monitoring in the source waters to determine which potential sources of contamination are significant or the susceptibility of the public water supply. Given the expense of modeling and monitoring, EPA believes that, in most cases, it would not be cost-effective to pursue such activities under a SWAP, since it must complete some level of assessment for <u>all</u> public water supplies. Rather, a state should derive as much information as

possible from existing monitoring and modeling efforts or results to support its assessment. Once completed, an assessment can, among other functions, assist the state in determining where additional monitoring and modeling activities are needed and pursue these efforts under appropriate federal and state programs. Therefore EPA discourages the use of the funds from the SWAP set-aside of the DWSRF for these activities unless the state can show that it provides a cost-effective means that are necessary for achieving the program's objective of completing assessments for all PWSs within the required timeframe.

Chapter 3

Tools for State Source Water Protection Program Implementation Including Petition Programs and the Drinking Water State Revolving Fund

Tools for State Source Water Protection Implementation Including Petition Programs and the Drinking Water State Revolving Fund

I. INTRODUCTION

As described in Chapter 2, the SDWA Amendments of 1996 require states to develop and submit to EPA for approval SWAPs. Upon EPA approval, these programs are to complete assessments for all Public Water Supply Systems within two years after approval if not extended as provided in the Amendments. This chapter addresses the principal potential application of these assessments after they are completed; i.e., development of SWP Programs.

In the 1996 Amendments to the SDWA, Congress included a number of important provisions related to SWP beyond the SWAPs, including: (1) continuation of the WHP program (section 1428) and new authority for states to support their WHP efforts through use of DWSRF funds [section 1452(k)(1)(D)]; (2) a new, optional petition program (section 1454) that states may use to help overcome cross-program coordination barriers and facilitate voluntary, incentive-based SWP efforts based on locally driven partnerships, and authorization to use DWSRF funds to carry out such programs [sections 1454(a)(1)(B)(i) and 1452 (k)(1)(A)(iii)]; (3) authority for states to use DWSRF funds to administer or provide technical assistance through SWP programs, except for enforcement actions [sections 1452(g)(2)(B) and (D)]; (4) new authority to provide localities with DWSRF loans that may be used to purchase land or easements from willing sellers or grantors, if the purpose is to protect source water and ensure drinking water standards compliance [section 1452 (k)(1)(A)(i)], and (5) new authority to provide loans to communities to implement local, voluntary, incentive-based SWP measures [section 1452 (k)(1)(A)(ii)].

While the 1996 Amendments do not confer any new regulatory or enforcement authorities for drinking water source protection upon the states, many of the provisions require EPA to further incorporate SWP into drinking water regulations, particularly as a basis for increased regulatory flexibility. (Chapter 4 describes how these SWP efforts can be coordinated with other drinking water programs to be of mutual benefit.)

These provisions of the SDWA 1996 Amendments are clearly intended to encourage states and localities to go beyond source water assessments and implement efforts to manage identified sources of contamination in a manner that will protect drinking water supplies. This objective is furthered by the requirement that these assessments be made available to the public because, along with other new required consumer awareness activities, such information will motivate citizens and communities to put in place local SWP Programs.

For example, in the report of the House Commerce Committee (whose bill, H.R.3604, contained the SWAP provision as enacted), states that, "the Committee recognizes that SWP can be a cost-effective strategy for ensuring safe drinking water supplies. . .To address SWP, the bill creates a new program in which states with primacy will conduct an assessment, coordinated with existing information and programs, to determine the vulnerability of a source of drinking water within state boundaries. . .A separate provision in the DWSRF section provides that DWSRF funds may be used. . .to administer state SWP programs, except for enforcement actions. . .designed to protect source water from threats identified during the assessment."

Furthermore, the Senate Environment and Public Works Committee report provides that, "the only options typically available to community water supply systems finding contaminants in their water supply have been treatment or the development of new water supplies. . .To remedy this problem, the bill adds a new section to the SDWA that provides a means other than treatment for CWSs to address problems or emerging problems of contamination," that is, SWP efforts including the petition program.

A. Local Source Water Protection Programs

In addition to the three steps of a source water assessment (delineation; source inventory; and susceptibility determination), a local SWP effort hinges on three key steps:

Local Teams

Before any meaningful approach to SWP can be developed, a team of responsible individuals needs to be assembled to guide the process in a cohesive, efficient manner. They need to be focussed on the primary objective of protection of drinking water sources, but they must also recognize the constraints from other ongoing activities in the watershed, and the opportunities to support other watershed objectives for conservation and habitat restoration. Ideally, a team will always have at least

one representative who is actually employed by a PWS. Getting local citizens involved in SWP efforts heightens a sense of ownership in protecting the resource. The participation of citizen groups such as retired volunteers has proven very effective in drinking water protection activities in the past.

Management Measures

Once potential contaminant sources to which a PWS may be susceptible have been identified and inventoried under SWAP assessments as outlined in Chapter 2, options for managing these sources need to be determined. The basic goal is to reduce or eliminate the potential threat to drinking water supplies within source water protection areas either through federal, state, or local regulatory or statutory controls, or by using non-regulatory (voluntary) measures centered around an involved public, while supporting conservation and other benefits from watershed protection and avoiding unnecessary adverse effects on other activities in the watershed. While land-use controls, regulatory and pollutant source management measures, and other methods have traditionally been used for a variety of purposes in controlling impacts of land use and municipal growth, only recently have these tools been employed to protect drinking water supplies on a large scale.

Contingency Planning

Contingency planning is simply the development and implementation of both long and short-term drinking water supply replacement strategies for supplying safe drinking water to the consumer in the event of contamination or physical disruption.

II. OPPORTUNITIES FOR SUPPORT OF STATE AND LOCAL SOURCE WATER PROTECTION EFFORTS UNDER THE SDWA OF 1996

The DWSRF was authorized under section 1452 by Congress to assist PWSs to finance the costs of infrastructure needed to achieve or maintain compliance with SDWA requirements and protect public health. In addition, states may use a portion of their capitalization grants to fund various state and local water systems management programs and projects including SWP activities. States may elect to use up to 31 percent of the funds available to them under section 1452 for eligible set-aside activities.

The following are descriptions of various set-asides directly relevant to SWP. (Please note that the set-asides described in subsections B through F are subject to an overall cap of 15 percent of the DWSRF capitalization grant, and that cap includes capacity development activities as well

SWP activities. Please see EPA's *Drinking Water State Revolving Fund Program Guidelines* [February 1997] for details.)

A. Funding for State Source Water Protection Programs under SDWA Section 1452(g)(2)(B)

A state may use up to 10 percent of its allotment to administer a SWP program (as well as a public water supply supervision program, capacity development program and operator certification program). While this set-aside has additional matching fund requirements, this section provides the state with the greatest flexibility in using the DWSRF to establish SWP programs. State programs could take virtually any form that represents a coherent, articulated basis for the appropriate use of taxpayers' funds for SWP.

Accordingly, the following is intended as a general discussion to suggest some of the wide scope of this flexibility. Each of the categories discussed in the following provide for a stronger focus of local, state or federal programs and activities on drinking water protection. Of course, a state program could use in conjunction parts or concepts from any or each of these categories, or other ideas, according to resources, opportunities or local appropriateness.

While this area of activity is optional, Congress' repeated, strong encouragement to states to translate their source water assessment results into protection indicates the need to consider, and to the extent possible, decide at the assessment stage on undertaking protection efforts. As noted previously, timely decisions on protection approaches can enable the most efficient use of data and analyses generated by assessments, and most fully capitalize on the one-time national investment in assessments. Possible state programs and activities could fall into any of several categories, particularly and most likely the following:

Source Water Protection Through Local Management

Under this approach, the state would focus its protection efforts on educating, equipping and funding local communities and conservation districts to undertake directly local SWP initiatives. Such an approach emphasizes local land use controls, ordinances, and management measures.

State technical assistance could help local entities put together a SWP strategy or specific management measures to carry out a local strategy; many of these local management measures could then be supported by the state using DWSRF set-

asides under section 1452(k)(1)(A) (see headings B through E below).

Even if a state decides to put its SWP focus elsewhere, some elements of this approach are likely to be helpful in any situation. Local leadership, cooperation and coordination are vital components of most successful SWP initiatives, and the SDWA Amendments provide a variety of resources that can be tailored to realize the potential of many local opportunities.

Source Water Protection Through Enhancement or Broader Integration of Existing State Management Programs

Many states currently have active programs to protect water resources from particular sources of contamination (e.g. the UIC Program, the Non-Point Source Program), or to protect waters or lands in a certain region(s) of the state, certain types of lands (e.g., agricultural lands), or land management generally on a statewide basis. The SDWA Amendments offer an opportunity to highlight or better integrate protection of drinking water sources into those states' proven, ongoing programs with a wide range of resource management and water quality protection objectives.

Often, drinking water protection may already be recognized as an objective of the state program, but perhaps not for both surface and groundwater, or for all relevant aspects of the program. Source water assessments may generate the information and analyses to meet the criteria or triggers in such programs, or to draw appropriate attention to the potential susceptibility of certain drinking water sources. These susceptible sources, once recognized, can be elevated within the existing program's framework of protection priorities. Finally, the additional resources made available under the DWSRF for source protection can make it possible to address the more vulnerable drinking water sources under the activities or authorities of the existing program, without disrupting the existing program's continuing priorities, or necessarily diverting its resources from those priorities.

Source Water Protection As A "Lens" to Focus Other Federal/State Programs

A wide range of programs at the state and particularly the federal level (see, e.g., Chapters 4 and 5 of this Guidance) offers relevant authorities and resources that can achieve SWP objectives. States may choose to use this approach to create or enhance a function to coordinate whatever programs in this range the state believes will contribute to reaching those objectives.

For example, a network or clearinghouse function could give a focal point and facilitate assistance for local governments,

water systems, and others in communities to gain access to these relevant programs and resources. The state office in which this assistance function was placed could provide a pathway through the complex and time-consuming job of identifying the various types of program help (regulatory and/or non-regulatory) that may be appropriate to a particular local situation, and pursuing them through different application processes and levels of government. After identifying appropriate state and/or federal programs, the state office could if necessary help to formulate and then present the relevant program applications or petitions and documentation to the appropriate agencies, and then work with the communities to advance these applications in the agencies' consideration processes.

States could adjust the level of effort of this function as appropriate to its resources and priorities. For example, a state clearinghouse office for SWP could respond to requests for aid of the type discussed above, or might use the source water assessments to identify high priority areas to work proactively with local communities to see that appropriate programmatic aid and attention was provided. Where communities that had been informed about their situations through the source water assessments sought help, the state clearinghouse could respond to these requests in its discretion by applying criteria or priorities selected by the state. This function would also help to improve coordination among the relevant agencies on SWP objectives at different levels of government as the applications and supporting information moved in tandem through the respective processes.

Comprehensive Approaches to Source Water Protection

Existing federal laws have tended to focus on specific source, pollutants, or water-related activities, and have not addressed the need for an integrated, multi-disciplinary approach to environmental management. Historically, successes in controlling water pollution have been most widespread in surface water through control of point sources and in ground water by preventing contamination from hazardous waste sites. Use of a watershed approach by states could integrate surface water protection programs with comprehensive ground water protection efforts, in order to focus resources of local, state and federal governments on protecting source water as a whole. States are uniquely positioned and qualified to foster comprehensive SWP because they implement most existing water and natural resource programs.

States desiring to move towards or adopt this approach can use the source water assessments as a starting point, to identify

which data developed by other programs can be used in the assessments. Assessment results that incorporate such data from multiple programs can provide a statewide priority-setting structure, by ensuring that the assessments include data appropriate and applicable to all relevant programs. This could provide a means to advance the coordination discussed in the approaches above, by seeking to coordinate drinking water and pollution control programs with state and federal administration of related programs, such as through the Farm bill, remedial efforts through Superfund, the UST program, RCRA, and management programs for air, toxic substances and pesticides, as well as appropriate state and local programs and initiatives. The more comprehensive the approach, the bigger the "toolbox" of existing management options for SWP.

B. Funding for State Wellhead Protection Programs Under SDWA Section 1452(k)(1)(D)

With few exceptions, most states now have EPA-approved WHP programs in place, which provide the cornerstone or a "head start" in undertaking the source water assessments required under the 1996 SDWA Amendments. State WHP Programs remain a requirement under section 1428 of the SDWA Amendments of 1996. Under section 1452(k)(1)(D), funds from the DWSRF may be used to enhance the implementation of these existing WHP programs or to develop such programs for submittal to EPA for approval.

C. Funding for State Petition Programs Under SDWA Section 1452(k)(1)(A)(iii)

Section 1452(k)(1)(A)(iii) of SDWA provides opportunities for loans to CWSs by funding State Source Water Quality Protection Partnership Petition Programs, which are detailed under section 1454 of SDWA. EPA is required under the legislative mandate of the SDWA Amendments of 1996 to issue guidance for this program, which is provided in Part III of this Chapter. There are particular benefits as well as limitations to the SDWA 1452 program that states need to consider before deciding on an approach to drinking water source protection. A state could establish a modified petition program to address those limitations, and such a program could be supported by the 1452(g)(2)(B) set-aside described above as well as 1452(k)(1)(A)(ii) described below.

D. Loans for Voluntary Incentive-Based Source Water Quality Protection Programs

Section 1452(k)(1)(A)(ii) provides for set-asides up to 10 percent of the total amount received in any particular year as part of a capitalization grant to the state for loans to

CWSs for voluntary, incentive-based source water quality protection measures. These funds are earmarked for the protection of source waters within areas delineated in assessments performed under section 1453 (or as performed, in advance of an EPA-approved SWAP, under an approved DWSRF workplan; see Chapter 2); to help achieve compliance with national drinking water regulations under section 1412, or otherwise enhance public drinking water source protection. These funds would be used under any state SWP approach, including those under section 1452(g)(2)(B) or 1454, as long as the activity assisted was voluntary and incentive-based.

Where assessment and delineation activities indicate agriculture is a potential source of contamination, states and local entities should consider applying set-aside funds towards voluntary agricultural resource management planning and implementation programs. These funds, in turn, could be made available to soil and water conservation districts, other local entities, and agricultural producers within a source water watershed to plan and implement improved management practices under an Resource Management Plans (RMPs) designed to protect the source water resource.

E. Land Acquisition and Conservation Easements

Funds for land acquisition and conservation easements are available under section 1452(k)(1)(A)(i) of SDWA 1996. These funds are to be provided as loans to acquire lands from persons willing to sell the land, or in the case of easements, the willing grantors of the easements, when the interest acquired will protect drinking water sources from contamination. Similar to loans for voluntary, incentive-based SWP efforts, loans under this subsection must also be intended to foster compliance with national primary drinking water regulations applicable under section 1412, and to significantly enhance the protection of public health.

III. GUIDANCE FOR STATE SOURCE WATER QUALITY PROTECTION PARTNERSHIP PETITION PROGRAMS

Section 1454 of the SDWA (section 133 of P.L. 104-741) establishes a new authority for a Source Water Petition Program. This state-administered program is voluntary for states, and is intended to support locally-driven efforts designed to address a limited number of contaminants identified in local SWP assessments. Petitions may address: (1) pathogenic organisms which are regulated (or for which regulation is required) by EPA drinking water

standards, or (2) contaminants detected in source water that are not at levels "reliably and consistently" below the MCL in the source water at the intake structure or in any collection, treatment, storage, or distribution facility. Under the state program, an owner or operator of a CWS, or a municipal or local government or political subdivision within the state may submit a source water quality protection partnership petition to the state, requesting assistance in support of a local, voluntary, incentive-based partnership among interested parties to protect their drinking water supply. The central focus of the petition program is to reduce or eliminate contaminants in the water supply by addressing their origin; obtain financial or technical assistance to facilitate efforts to protect source water in order to meet national primary drinking water regulations and standards; and help develop voluntary and incentive-based strategies for the long-term protection of source water supplying a CWS. A state may submit a Petition Program for approval at any time; it is not necessary to wait until source water assessments are completed.

A. State/Local Program Procedures

1. Substance of Petitions and Process for Submission of Petitions To the State

A petition must: facilitate the local development of voluntary, incentive-based partnerships among owners and operators of CWSs, governments, and other persons in source water protection areas; and obtain assistance from the state in identifying resources which are available to implement the recommendations of the partnerships to manage the origins of the contaminants affecting the drinking water supplies of a community.

Contaminants addressed under a petition are limited to pathogenic organisms for which a national primary drinking water regulation has been established (or is required under section 1412), or contaminants for which a regulation under section 1412 has been promulgated or proposed, and that are detected by adequate monitoring methods at the source water intake structure or in collection, treatment, storage, or distribution facilities in the CWS when they occur above the MCL; or are not at levels reliably and consistently below the MCL.

Petitions submitted under this program must at a minimum contain the following information: (1) a delineation of the source

water protection area that is the area of consideration of the petition; (2) the identity of the origins to the maximum extent practical of the drinking water contaminants that are to be addressed by the petition that are found within the delineated source water protection area (including descriptions of specific activities to the maximum extent practical contributing to the presence of the contaminants); (3) the identity of information gaps that would hinder the development of recommendations made by the voluntary local partnership for addressing drinking water contaminants that are to be addressed by the petition; (4) documentation of efforts made to establish the voluntary local partnership, including solicitation of private individuals living within the delineated source water protection area who are likely to be affected by decisions made by the partnership and whose participation is essential to the success of the partnership, and members of municipal or other local governments or political subdivisions of the state with jurisdiction over the delineated source water area; (5) a description of how the voluntary local partnership has or will identify, recognize, and take into account any voluntary or other activities already underway under federal or state law in the delineated source water protection area that are aimed at reducing or eliminating the likelihood that contaminants will occur in drinking water at levels of public health concern, and (6) a description of technical, financial, or other assistance that the voluntary local partnership requests of the state to help develop the partnership, or to implement the recommendations of the participants in the partnership.

2. Recommended State Procedures for Approval/Disapproval of Petitions Submitted by Local Voluntary Partnerships

The state may approve a petition if it meets the requirements of section 1454 (a). States must provide a notice and an opportunity for public comment on petitions submitted under section 1454, and states must approve or disapprove the petition in whole or in part within 120 days after submission.

If the state approves a petition, a notice of approval must be provided, giving the following information: (1) an identification of technical, financial, or other assistance the state will provide to help address drinking water contaminants identified in the petition based on public health concerns relative to other water quality needs identified by the state; coordination with any other states' programs implemented or planned under section 1454; and funds available (including DWSRF monies accessed through CWA or SDWA State Revolving Funds), and (2) a description of technical or financial assistance available

from state or federal programs to assist in implementing the recommendations of the local voluntary partnership in the petition. Disapproved petitioners may resubmit at any time if new information becomes available, if conditions affecting the source water that is the subject of the petition change, or if modifications are made in the type of assistance being requested.

3. Technical and Financial Assistance Available to Localities with Approved Petitions

Assistance is available to help implement the recommendations made by the partnership in the petition, including any program established under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.); programs established under section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 (16 U.S.C. 1455b); agricultural water quality protection program established under Chapter 2 of subtitle D of title XII of the Food Security Act of 1985 (16 U.S.C. 3838 et seq.) and the Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127); the SSA Program established under section 1427; the Community WHP Program established under section 1428; any pesticide or ground water management plan; any voluntary agricultural resource management plan or voluntary whole farm or whole ranch management plan developed and implemented under a process established by the Secretary of Agriculture; and any abandoned well closure program.

Full use of available technical and financial assistance will depend upon the extent to which states encourage and assist municipalities, local governments, and CWSs to understand and take advantage of existing programs at the state level that are available to help them address sources of contamination in source water protection areas. These include programs for the management of solid waste, USTs, fertilizer and pesticide use, recycling and reclamation, underground injection disposal wells, state Superfund programs, and others. A large part of the public participation component of any source water quality protection partnership petition program may be focussed on making sure that the partnership members know and understand about these existing state programs and their corresponding funding mechanisms and opportunities for integration into a comprehensive SWP partnership. This helps conserve resources, maximizes both regulatory and non-regulatory management mechanisms, and assures equal representation of the various members of the partnership in helping to bring about consensus at various stages of decision making as the partnership matures and begins to implement its recommendations.

4. EPA/State Procedures for Grants

Procedures and Substance of a Submittal of a State Source Water Quality Protection Partnership Petition Program for EPA and Approval of Such Programs

(a) Substance of a State Program Submittal

The design of the State Source Water Quality Protection Partnership Petition Program may be to ". . .assist in the local development of a voluntary, incentive-based partnership, among the owner, operator, or government and other persons likely to be affected by the recommendations of the partnership. . ." Beyond this statutory definition, the state may consider how well the structure of its Source Water Quality Protection Partnership Petition Program satisfies the following underlying goals: meeting the spirit and intent of the SDWA Amendments of 1996 (e.g., affording locals the opportunity to develop their own drinking water protection program through the use of the petition process); recognizing the diversity of hydrogeologic settings and sources of contamination that may be encountered on the local level; allowing local entities maximum creativity and flexibility in designing and implementing the recommendations of the petitioners; recognizing state and local primacy in matters of land use and water allocation, and assisting local entities in achieving comprehensive SWP by offering the petition process as a balancing tool in an overall array of state-administered drinking water protection programs such as the state's WHP, Sole Source Aquifer, and watershed protection programs.

(b) Procedures for Submitting a State Program for Grant Assistance and for EPA Approving a Program

State programs developed for Source Water Quality Protection Partnership Petition Programs may be submitted to EPA at any time. If, after a period of 120 days after the date of submission of the program, unless EPA determines that the program does not meet the statutory requirements as specified under section 1454(a) of SDWA, the program shall be deemed approved. If EPA disapproves a petition program (in whole or in part) during the 120-day period after submission of the program, EPA will immediately notify the state, and will work with the state to assist in the modification or redevelopment of the program to meet the statutory requirements necessary for approval. Once EPA approval has been obtained, states may immediately begin implementing the receipt, review, and approval process for petitions received from local, voluntary, incentive-based partnerships for SWP at the community level.

(c) Adequacy Criteria for EPA Approval of State Program Submittal

EPA approval of State Source Water Quality Protection Partnership Petition Programs will be based upon how adequately the state's program process considers and evaluates the objectives of the local entity filing the petition. These objectives include how well the state's program process facilitates the development of local, voluntary, incentive-based partnerships through coordination of local governments, persons living within source water protection areas affected by the decisions or recommendations of the partnership, and owners and operators of CWSs, and how well the state program process provides for assistance from the state in identifying resources available to the implement the recommendations of the partnership in addressing the origins of drinking water contaminants specified in the petition. (This includes the specific activities to the maximum extent practical contributing to the presence of the contaminants affecting the drinking water supplies of the community). The contaminants for which petitions may be submitted are specified under section 1454 (a) (3).

(d) Grants to States

Grants may be made to each state that establishes an EPA-approved petition program in an amount not exceeding 50 percent of the cost of administering the program for the year in which the grant is made available. In order to receive this grant assistance, states must have approved programs that meet the criteria and objectives of section 1454, as described in this guidance. **NOTE: No funds were appropriated for grants under section 1454 (c) in Fiscal Year 1997. As of this writing, neither House nor Senate appropriations bills for FY 1998 contain a section 1454(c) grants provision. However, states can use DWSRF funds under section 1452(k)(1)(A)(iii) for loans to implement petitions.**

These grant program procedures and submittal are only required if appropriations are provided for section 1454 of the SDWA and a state chooses to submit and apply for a grant.

5. Additional Funding for Local Source Water Petition Programs

(a) Drinking Water State Revolving Fund

A state may make a loan to assist a CWS implement voluntary, incentive-based SWP measures resulting from the implementation of recommendations specified by a local partnership petition submitted to the state. Only community (not non-community) water systems are

eligible for this assistance, and only pathogenic organisms, and chemicals exceeding MCLs or chemicals not reliably and consistently below established MCLs can be identified as contaminants in the petition. If a state elects to use the DWSRF set-aside, the state must develop a list of systems that will receive loans, giving priority to projects that promote compliance and protect public health, and subsequently seek public review and comment on this list. States are encouraged to review EPA's recently released final guidelines on the DWSRF for use in prioritizing projects eligible for loans under the set-aside.

(b) Sense of the Congress Regarding the CWSRF

Section 606(c)(1) of the CWA provides for a listing of state activities for water pollution control eligible for funding assistance under sections 319 (Non-Point Source Program) and 320 (National Estuary Program) as well as under the state's CWSRF IUP. It is the sense of the Congress that each state in establishing priorities under this section of the CWA may give special consideration to projects that are eligible for funding under that Act, and that have been recommended pursuant to a petition submitted under section 1454 of SDWA (section 133(b) of the SDWA Amendments of 1996).

B. Benefits and Limitations of the Petition Program

The petition program can support efforts to focus other relevant state and federal programs towards SWP activities. It is intended to provide a process by which states may encourage and facilitate voluntary, incentive-based local partnerships as another tool in the drinking water compliance toolbox to address existing and emerging problems at the local level. The process is also intended to gain access to various forms of financial and technical assistance critical to successful local SWP partnerships. For local entities, the formation of a local partnership will be the crucial part of the petition process; for the state, a designated liaison person could screen applications, and if the petition is deemed valid, serve as the "lens" to focus various forms of technical and financial assistance available under both the drinking water and other state and federal programs. It would then be up to the respective program administrators to decide whether to provide assistance to the community and selected source water entities.

A short public comment period is provided in the process to ensure that both drinking water and source water stakeholders are made aware of the request and have an opportunity to provide input.

A great majority of resources that could be brought to bear in supporting the petition process fall under the jurisdiction of programs beyond the scope of SDWA or the drinking water community (e.g., CWA, the Federal Agriculture Improvement and Reform Act of 1996). The petition program attempts to focus these scarce resources on drinking water protection by encouraging the formation of local partnerships and by seeking the presentation of basic information such as the nature of the problem to be addressed; identification of information gaps; efforts to establish a local partnership; recognition of ongoing efforts; and the type of assistance required. The intent of such a petition is to provide a strong link between the requested assistance and achieving public health protection. Without establishing this link, it may be difficult to obtain resources from federal/state programs that are important to SWP at the local level, but not part of the SDWA.

While the petition program may provide a valuable adjunct to total SWP, it does have some key limitations. Although local petitions can be developed to prevent microbial contamination, such petitions can only be developed after chemical contamination has already occurred, thus not a preventive approach. Thus, the program is not totally a prevention program approach in the traditional sense. Specifically, under section 1454, local systems may only use the petition program if they have a contaminant exceeding the MCL (e.g., a violation of the MCL), or for contaminants which do not appear consistently and reliably at or under the MCL at the system intake structure. States may want to instead have a more prevention-oriented program approach than that afforded by the petition program. For example, the state may want to consider establishing detection levels for some contaminants in the source water upstream of the intake structure as the basis for a petition, or a petition could be in regard to potential sources that may not yet have released pollutants to the environment (e.g., USTs).

The procedures and prerequisites required of local and state government by the 1454 program may delay the resolution of violations or near-violations of MCLs or the prevention of near violations of MCLs by a PWS. Also, limiting a state to voluntary, incentive-based programs could result in a fragmentation of regulatory from non-regulatory programs, whereas a more integrated program could be more efficient.

For these reasons, states and local communities need to consider the net benefit of the section 1454 petition program in comparison to other approaches—including a modified petition approach, or a more comprehensive SWP program (e.g., WHP or watershed

protection) in terms of cost and efficacy in protecting the public health. The state should evaluate the advantages and trade-offs inherent in those programs before deciding what is right for them.

If a state chooses to establish a 1454 petition program or a modified version of the program tailored to meet the state's needs, both are eligible for DWSRF support under section 1452(g)(2)(B). In addition, a 1454 petition program or some other voluntary program could be the basis for providing DWSRF loans to CWSs under subsection (ii) of section 1452(k)(1)(A), though loans under subsection (iii) may only be made within a section 1454 program.

EPA is required to issue this guidance on the petition program, but a state program is subject to approval by EPA under section 1454 only if the state is to receive funds to administer the program from funds specifically authorized under section 1454(e). To date, EPA has not requested such funds, and no funds have been appropriated. Nevertheless, a state may find guidance on the petition program to be helpful in evaluating the usefulness of the petition program option and various alternatives. This evaluation can lead to a state's tailoring a workable vehicle for encouraging local partnerships and facilitating coordination across federal and state programs necessary for successful source water protection.

Chapter 4

Relationship Between Source Water Assessments and Source Water Protection Programs, and the Public Water Supply Supervision Program

Relationship Between Source Water Assessments, Source Water Protection Programs, and the Public Water Supply Supervision Program

I. INTRODUCTION

Preventing the contamination of and maintaining good quality drinking water supplies are the primary goals of SWP efforts under the SDWA. Reducing or preventing chemical and microbiological contamination of source waters could allow PWSs to avoid costly treatment or minimize monitoring requirements. States could also save resources that would otherwise have to be devoted to compliance assistance, oversight, and enforcement. The purpose of this chapter is to identify those programs either already established or under development in the PWSS Program that could benefit from SWP efforts, and in turn, discuss how some PWSS activities can help states and systems achieve objectives of the source water assessment and protection programs.

II. WELLHEAD PROTECTION

As discussed throughout this document, the WHP program is a pollution prevention program designed to protect ground water-based sources of drinking water, and offers important linkages for state source water assessment and SWP programs. The 1996 SDWA Amendments continue the requirement under section 1428 for WHP program implementation, as defined by the 1986 SDWA.

III. INTERIM MONITORING RELIEF

How can source water assessments assist an interim monitoring relief program?

Under section 1418(a),states may reduce monitoring relief requirements for most contaminants for an interim period for systems serving under 10,000 people if: (1) the initial sample fails to detect, at the time of greatest vulnerability, the presence of the contaminant; and (2) "the state, considering the hydrogeology of the area and other relevant factors, determines in writing that the contaminant is unlikely to be detected by further monitoring during such period."

The interim monitoring relief period would end either when alternative monitoring is

adopted and approved for the state, or August 1999, whichever comes first. Interim monitoring relief would not apply to microbiological contaminants, disinfection byproducts, or corrosion byproducts, but would apply to all other chemical contaminants. To serve as the basis for interim monitoring relief, monitoring conducted at the beginning of the period must occur at the time determined by the state to be the time of the source water's greatest vulnerability to the contaminant, "taking into account in the case of pesticides the time of application of the pesticide for the source water area and the travel time for the pesticide to reach such waters and taking into account, in the case of other contaminants, seasonality of precipitation and contaminant travel time." States could use any relevant information gleaned from source water assessments to help determine whether interim monitoring relief for given systems and contaminants would meet those requirements. At a minimum, assessments would help the state identify those systems likely to be eligible or ineligible for monitoring. However, EPA recognizes that, due to the different timing of the interim monitoring relief and source water assessment provisions, few new assessments (as opposed to data from existing sources) are likely to be available in time to be useful for interim monitoring relief decisions.

IV. ALTERNATIVE MONITORING

How can source water assessments assist states in implementing an alternative monitoring program?

Under section 1418 (b), states with an approved SWAP may adopt "tailored alternative monitoring requirements" where the state "concludes that (based on data available at the time of adoption concerning susceptibility, use, occurrence, or WHP, *or from the state's drinking water source water assessment program*) such alternative monitoring would provide assurance that it complies with the Administrator's guidelines." (emphasis added) EPA has published guidelines for alternative monitoring under separate cover. Alternative monitoring does not apply to microbiological contaminants, disinfection byproducts, or corrosion byproducts - it would apply to all other chemical contaminants.

Under alternative monitoring, states may allow reductions in monitoring frequency for most chemical contaminants in accordance with the provisions of the Alternative Monitoring Guidelines released simultaneously with this guidance.

Alternative monitoring provides one of the clearest potential benefits for states and systems to conduct source water assessments. Primacy states that do not

have an EPA-approved SWAP will not be eligible to offer alternative monitoring to their PWSs. For a PWS to be eligible for alternative monitoring, the assessment for the delineated area or areas from which the PWS derives its source water must be completed.

Unlike the limited time frame for granting interim monitoring relief, there is no time constraint for granting alternative monitoring by the state. This should encourage states not only to conduct source water assessments so as to gather information needed to make alternative monitoring determinations, but to maintain an active and comprehensive assessment program. States that do so will be at an advantage in responding to system requests for monitoring, and in responding to the public regarding good science justifications for such decisions. Source water assessments will provide states with greater knowledge about their PWSs which will translate into increased flexibility not only for granting alternative monitoring, but for using other regulatory options as discussed below.

V. CHEMICAL MONITORING REFORM

How can CMR assist states and localities in conducting source water assessments?

An Advanced Notice of Proposed Rulemaking for CMR was issued on July 3, 1997. The rule is projected to be promulgated by August 6, 1998. EPA is considering requiring states to screen their systems to identify those systems at risk of contamination and establish sampling during the period(s) of greatest vulnerability. This screening and the development of system specific sampling schedules will typically involve identifying potential contamination source(s) and determining the probable timing of greatest contamination based on the management of those sources and intervening hydrogeologic or climatic features. These analyses would support, and be supported by, activities that states undertake in implementing a SWAP. Depending on the timing of the CMR regulations, states could incorporate data from screening analyses conducted under CMR into their SWAPs or vice-versa. The process of targeting at-risk systems may help states establish priorities for conducting more thorough assessments.

How can source water assessments assist in the development and implementation of CMR?

A state SWAP could serve, at least in part, as a technical basis under the CMR for screening systems to determine which are at risk. For many states, the information collected through the source water assessments could provide a necessary component for meeting the requirements of CMR.

VI. SURFACE WATER TREATMENT/DISINFECTION BYPRODUCTS RULES

How can implementation of the Surface Water Treatment Rule assist states and localities in conducting source water assessments?

Under the SWTR, a system is eligible for a waiver from filtering their surface water supply only if a series of water quality and disinfection criteria are met, and the system maintains a watershed control program satisfactory to the state that minimizes the potential for microbial contamination. Systems that have received such waivers have source water delineations and an inventory of potential sources of pathogens in the watershed, in particular *Giardia* and viruses. They also have a source water monitoring program for coliform bacteria and turbidity, and are subject to annual inspections that include a review of the effectiveness of the watershed program. In these cases, states are encouraged to use information already available with respect to SWTR contaminants in conducting assessments of these systems. For systems with approved filtration waivers where sources of regulated microbial contaminants have been assessed, states or delegated entities must conduct assessments for potential chemical contamination as well if they have not been previously inventoried and analyzed to determine susceptibility.

How can source water assessments assist implementation of the Surface Water Treatment Rule and future Enhanced Surface Water Treatment rules?

In overseeing approved filtration avoidance waivers, states may benefit from additional information that would otherwise not be available in the absence of source water assessments. The SWTR is designed to minimize risks from only a subset of microbial contaminants (*Giardia,* viruses, *Legionella*) and filtration avoidance determinations could have missed potential sources of contamination from *Cryptosporidium*, a pathogen which will be regulated under the Enhanced SWTR, as well as other indices such as phosphorous loadings or chemical contamination. In addition, assessments could provide information on activities in the watershed

with potential for contamination of source water, and on water quality in waterbodies upstream from drinking water reservoirs (e.g., tributaries) that could signal potential threats. This type of information could provide states and systems with important tools to identify problems and prevent contamination that could ultimately trigger filtration requirements. Further, this information could prove invaluable in efforts by states and systems (both filtered and unfiltered) to prepare for future regulatory requirements for Enhanced Surface Water Treatment and Disinfection Byproducts.

The Agency encourages states to review available information on their unfiltered surface water systems in cases where watershed land is not protected, to determine whether or not system vulnerability to microbial contamination has increased since a filtration avoidance determination was made. Where states determine that microbial vulnerability has significantly increased, states may find that additional SWP measures or assessments are needed, or ultimately, that filtration cannot continue to be avoided.

For surface water systems that have filtration in place, the SWTR does not require any SWP measures. Filtration systems require proper operation and maintenance and are generally expected to remove only 99% (2 log) of *Giardia* and a lesser percentage of viruses from source water. In addition, unless attention is paid to the effluent quality of each individual filter, the treatment plant may be subject to suboptimal performance. Assessments in conjunction with other watershed protection measures could identify potential threats and help such systems maintain multiple barriers against microbial contamination and good source water quality and thereby avoid the need for additional treatment, as recommended in the SWTR Guidance Manual. Since additional treatment can only be provided in the form of increased disinfection, this would have the adverse effect of increasing the level of disinfection byproducts. Assessments could also assist states to prioritize oversight, technical assistance efforts, or DWSRF funding considerations for those systems that are at increased risk of source water contamination. As noted above, if properly designed, operated and maintained, filtration will remove 99% of *Giardia* in the source water; it also removes a similar percentage of *Cryptosporidium*. Because of *Cryptosporidium*'s extreme resistance to most disinfectants, in particular to chlorine, utilities with poor source water quality might be required, under a future enhanced SWTR, to modify disinfection or add treatment. Any of these options would require major expense that could be avoided if source water contamination by *Cryptosporidium* is adequately controlled.

How can source water assessments assist in the implementation of future Disinfection Byproduct Rules?

Source water microbial quality and the levels of disinfection byproduct precursors (naturally occurring organic matter that reacts with disinfectants to form disinfection byproducts), will be key factors in determining the level of treatment that will be required under the future Enhanced SWTR, as well as the Stage 1 and 2 Disinfection Byproduct rules. Predicted costs to comply with more stringent standards for disinfection byproducts increase rapidly if a change in treatment becomes necessary. Knowledge of watershed characteristics, sources of contamination, and variability of source water quality will be important in evaluating the feasibility of reducing (organic) disinfection byproduct precursors, e.g., by reducing nutrient levels from fertilizer overuse or from sewage treatment plant discharges. Sources of disinfection byproduct precursors are often also sources of pathogen contamination. Controlling sources may be the most economical long-term solution for some utilities to meeting more stringent disinfection byproduct standards as well as avoiding expensive treatment technology changes to meet future microbial standards.

VII. UNDERGROUND INJECTION CONTROL: CLASS V WELLS

How can implementation of the UIC program assist states in conducting source water assessments?

The UIC program addresses various types of wells where fluid wastes from industrial, commercial, or municipal operations are injected into the ground to various depths. Different types of wells are regulated under different regulatory programs. For example, Class I and Class II wells inject wastes from industrial and municipal, and from oil and gas operations, respectively, to depths typically to thousands of feet. While Class I and II wells can be numerous in some areas, they are not considered a significant risk to drinking water supplies. Not only are their depths generally below aquifers used for drinking water, Class I and II deep wells are strictly regulated by state or EPA UIC permitting programs. The controls for these deep wells focus on well siting, construction, operation, and closure. Because these safeguards are sufficient in protecting even special sources of drinking water, source water programs should not emphasize further risk assessment for Class I and II wells in source water protection areas.

In contrast, Class V wells usually inject wastes to relatively shallow depths that can lie above drinking water sources underground. Further, Class V wells do not have prescriptive operating and construction requirements and are not completely inventoried. Given these factors, Class V wells can pose risks to drinking water sources and should be included in SWAPs.

Class V program staff can identify Class V wells that are potential sources of contamination in wellhead and source water protection areas, particularly those that may pose a risk to a community's water supply. Class V program staff, as a priority, have targeted shallow underground disposal wells in source water protection areas to ensure that the wells comply with the SDWA by having owners and operators close the well or having other management measures applied to avoid endangerment.

Class V wells are one of the most important sources of contamination to public water supplies and may always be a high priority for identification when assessments are conducted. Unfortunately, these wells are not easily found since they may consist of a septic system that a commercial facility misused to dispose of its wastewater, or floor drains at industrial/hazardous material-handling facilities. Further, some Class V wells, such as appropriately operated septic systems, may pose relatively low risks to an aquifer compared to other contamination

sources in the same source water protection area. Class V program staff may have an inventory of the Class V wells that are located in a source water protection area and may assist with the search for high risk facilities.

EPA has transferred primary enforcement authority for the Class V UIC program to 34 states. Programs in the remaining 16 states are implemented by EPA at the Regional level. EPA Regions also implement Class V programs for Indian tribes and territories.

How can source water assessments assist implementation of the Class V Program?

State SWP programs can support Class V programs by addressing Class V wells in source water protection areas. EPA is developing proposed regulations to be published by June 18, 1998 that are anticipated to target high risk Class V injection wells, such as large capacity cesspools and industrial waste wells in source water protection areas. Once new Class V rules become effective, it will be important that source water protection areas are delineated if the final rule targets high risk wells in these areas. Source water assessments will help state UIC program managers save considerable resources by allowing these regulations to be targeted, as a program priority, to delineated source water protection areas.

For Class V well categories other than cesspools and industrial disposal wells, such as agricultural drainage wells, risk and impact information is limited and the wells will not be regulated until sufficient information is gathered. A SWAP can assist the Class V program in the national study of Class V wells where EPA will be collecting information on those Class V wells that have been identified in source water protection areas. This information, in turn, can be used to support the Class V rulemaking and determine whether additional regulation is needed.

VIII. SANITARY SURVEYS

How can sanitary surveys assist states in conducting source water assessments?

The purpose of a sanitary survey is to evaluate and document the capabilities of a PWS to continually provide safe drinking water and identify any deficiencies. A system's treatment, storage, distribution network, operation and maintenance are evaluated as part of a survey. In addition, a sanitary survey could include analysis of the source waters for the system. Sanitary surveys provide a fundamental understanding of current and potential threats to water quality and system reliability. Sanitary surveys could provide the opportunity for state drinking water officials (or approved third party

inspectors) to conduct the formal source water delineations and assessments.

If states choose to rely on the sanitary survey schedule to conduct all of their source water assessments, one concern would be whether the assessments could be completed within the time frame specified in the Act. Under 40 CFR 142.10, states must establish a systematic program for conducting sanitary surveys, with priority given to PWSs not in compliance with drinking water regulations. The 1995 EPA/State Joint Guidance on Sanitary Surveys recommends numerous factors for states to consider in establishing a survey plan. These plans will be negotiated with EPA Regional Offices. In many cases, the sanitary survey plans and the SWAPs could be integrated by the state to insure completion of source water assessments so that the two can be done concurrently. Sanitary surveys could provide one means of providing updates to the SWAP and follow-up on development of SWP activities.

How can source water assessments assist states in conducting sanitary surveys?

States could use information collected in source water assessments, whether done separately or concurrently, to enhance sanitary survey information and to identify systems of concern that may receive priority for surveys.

IX. GROUND WATER DISINFECTION RULE

How may source water assessments and protection measures help prepare states and PWSs for the GWDR?

Section 1412(b)(8) of the SDWA directs EPA to issue a regulation after August 1999 requiring disinfection for ground water systems, as necessary, after publishing criteria for states to use to determine if ground water systems need to disinfect. In developing the GWDR, EPA is considering strategies to control risk from microbial contamination as an alternative to disinfection. These strategies are likely to include a well vulnerability determination that evaluates, among other things, the following WHP-related activities:

- Delineation of a microbial protection area (e.g., is it based on scientifically defensible microbial inactivation rates, or an equally protective method?)

- A thorough inventory of significant potential microbial sources of contamination within the delineated area (e.g., are sources present and what is the relative risk they represent?)

- An assessment of the hydrogeologic conditions that apply to a PWS's source waters (e.g., is the system in an area of intrinsic groundwater sensitivity?), and

- The relative effectiveness of microbial source management controls (e.g., do established microbial setback distances for sources provide protection equivalent to the delineated microbial protection area? Has the effectiveness of specific best management practices for minimizing microbial contamination been demonstrated in the field?)

When developing their SWAPs, states should review the strategies being considered for the GWDR. EPA also encourages states to review the components of their WHP Programs and establish setback distances for potential microbial sources to ensure that they adequately address microbial contamination risks.

X. CAPACITY DEVELOPMENT

How can source water assessments assist in the development of an effective capacity development strategy?

The 1996 Amendments to the SDWA limit the availability of assistance from the DWSRF to systems which possess or can develop technical, financial, and managerial capacity to comply with SDWA requirements. States wishing to receive the full DWSRF allotment will need to prepare a capacity development strategy to assist PWSs in acquiring and maintaining technical, financial, and managerial capacity.

Technical capacity may be generally understood in terms of three issues: source water adequacy, infrastructure adequacy and technical knowledge. Source water adequacy can be defined as reliable water sources, awareness of source water issues, and may include a SWP plan. Source water assessments can provide information directly relevant to determining source water adequacy, and, in turn, building of technical capacity and a capacity development strategy.

How can the capacity development strategy assist states in conducting source water assessments?

The capacity development requirements of the SDWA are extremely flexible, and allow states to develop creative ways to help systems build capacity. This guidance emphasizes the importance of source water assessment in the bigger picture of public health protection. If technical capacity of a system is lacking and source water represents a significant weakness, the capacity development strategy should direct

attention onto that element. Because the capacity development strategy also includes managerial and financial capacity as well as technical, states can use this opportunity to develop a comprehensive approach to strengthening their drinking water systems.

The holistic approach embodied in capacity development leads naturally to an integrated view of source water assessment/protection. Capacity development is compatible with source water assessment and protection since both focus on the foundations of safe drinking water.

XI. OPERATOR CERTIFICATION

The 1996 SDWA Amendments require states by February 2001 to implement an operator certification program based on guidelines, established by EPA, setting minimum standards for operators of PWSs. Both operator certification and SWP focus on prevention. Operator certification will help to ensure that PWSs have the technical and managerial capacity and training to provide safe water on a continuing basis. Successful state SWAPs will require active involvement by PWS operators. In this regard, training for certified operators should include an understanding of SWP as a prevention technique to protect public health.

How can an operator certification program assist states and localities in conducting source water assessments?

The presence of certified operators can assist the state in conducting source water assessments, particularly if operator certification includes knowledge of ground water and watershed protection problems and techniques to solve these problems.

A fully trained operator, as the on-site professional, should understand the benefits of multiple barriers to prevent contamination of drinking water supplies and should be able to provide important insights into the risks to water supplies from different, potential sources of contamination.

Chapter 5

Coordination of Source Water Assessments and Source Water Protection Programs, and Other EPA and Federal Programs

Coordination of Source Water Assessments, Source Water Protection Programs, and Other EPA and Federal Programs

I. INTRODUCTION

Protecting ground and surface sources of drinking water supplies requires a wide array of actions ranging from establishing partnerships, assessing the vulnerability of critical water and biological resources, identifying and controlling sources of pollution, land use planning and management, monitoring for contaminants, nutrients, and other water quality parameters, and enforcement of various local, state, and federal laws. Any of these efforts benefit from coordination and communication across different levels of public and private interests, and reliance on a range of funding sources, regulatory/permit requirements, and voluntary agreements.

The 1996 SDWA amendments provide states with new opportunities to protect drinking water by engaging the public, the private sector, and governmental agencies to take advantage of functions outside the traditional drinking water programs discussed in Chapter 4. Several states have already taken steps in this direction by adopting, for example, a statewide watershed management framework. The basic framework is to consolidate and synchronize planning and implementation efforts for individual watersheds or river basins. Such an approach pools expertise and funds to solve common concerns among partners, tailored to geographically-focused areas that cross jurisdictional or programmatic boundaries.

As many states have discovered, water quality programs can be significantly more effective by collaborating with other agencies and integrating other program elements such as transportation, agriculture, mining, forestry, fisheries and wildlife, housing, tribal affairs, parks and public lands, land use and infrastructure planning, energy utilities, hazardous and solid waste, and toxic substance control. Source water assessments can provide better, locally-focused data that tie into a comprehensive state water quality management program that includes ambient water quality standards and monitoring, wastewater permitting, water withdrawal permitting, non-point source controls, pollutant load allocation, pollutant trading, watershed planning and other elements of water quality protection. In this way, SWP can become more than a programmatic end in itself; it can become a "lens" by which states look at their priorities in other

programs, and focus on drinking water as a central element in overall water quality management.

This chapter summarizes some of the existing programs outside the SDWA, administered by EPA or other federal agencies, that states can build on in developing and coordinating their source water programs. The linkages described here can be important for building a strong base of information for source water assessments, as well for initiating and evaluating mitigation, protection and restoration strategies, contingency planning, and emergency response. How these various programs will be blended together will depend on priorities in different states or regional areas across neighboring states, as well as the unique characteristics and needs for localized aquifers, or individual watersheds, basins, reservoir systems, rivers, or streams. A more detailed guide to linkages with other programs will be provided in a subsequent guidance.

II. INTEGRATING SOURCE WATER ASSESSMENTS AND PROTECTION WITH OTHER EPA WATER PROGRAMS

Water Quality Standards

Water quality standards are a fundamental component of watershed management; they are adopted by states and tribes to protect public health, restore chemical, physical, and biological integrity of waters, and provide water quality for the protection and propagation of fish and wildlife, and recreation ("fishable/swimmable"). Standards consider the use and value of state and tribal waters for public water supplies, agricultural and industrial purposes, and navigation. Water quality standards depend on the designated uses of the waterbody, and are based on water quality criteria established by EPA.

Water quality criteria set levels on individual pollutants or parameters, or describe conditions of a waterbody that, if met, will generally protect the designated use of the water. EPA has developed to date, 103 recommended aquatic life or wildlife criteria and 181 recommended human health criteria.

How can the water quality standard program assist states and localities in implementing source water protection programs?

State or tribal water quality standards could be the core framework on which to base SWP, planning and management. Where a particular water is designated as domestic water supply, human health criteria are benchmarks to determine if the water is meeting its drinking water use, and for establishing the basis for controls on

pollutant discharges or for management actions to ensure that the drinking water use will be attained. Where criteria have not yet been established for pollutants considered to be at elevated levels in particular waterbodies, states or tribes typically use MCLs or maximum contaminant level goals (MCLGs) as levels that should not be exceeded in ambient water.

For water bodies that already meet designated uses, water quality standards contain antidegradation provisions to ensure that water quality is maintained (unless, through a public process, some lowering of water quality is deemed to be necessary to allow social and economic development to occur), and to identify water bodies of extraordinary ecological or recreational significance or rarity and safeguard water quality in such water bodies.

The antidegradation policies of states and tribes ensure that water quality is conserved where possible and lowered only when necessary, and that those affected by the lowering of water quality have a say in the final decision. As a result, antidegradation policies are well-suited to assist states, tribes and local communities in watershed protection programs. Sensitive or highly valued waterbodies used as drinking water supplies can be identified and protected from degradation. For drinking water supplies that exceed minimum standards necessary to support fish and aquatic life and recreation, water quality can be maintained unless there is a demonstrated need to lower water quality. State and tribal antidegradation policies and procedures can create a systematic and accessible planning process that protects against haphazard development having negative impacts on water quality in source waters. Additional authorities exist at the local level beyond state and federal authorities which may allow additional protections to be put in place in accordance with a watershed management plan.

The Watershed Approach*:* *Key Elements*

Partnerships. The wide variety of individuals, water suppliers, industry and agricultural representatives, Native American tribes, government agencies, citizen groups, conservation districts, the academic community, etc., who depend upon the natural resources within the watershed, as well as downstream users, should be involved in planning and implementation.

Geographic Focus. Activities are directed within specific geographic areas, typically the areas that drain to surface water bodies or that recharge or overlay ground waters or a combination of both.

Sound management techniques based on strong science and data in a decision making process that includes:

- Assessment of natural resources;
- Goal setting based on the condition or vulnerability of natural resources and ecosystems, and the needs of the community;
- Identification of priority problems;
- Development of specific management options and action plans;
- Implementation; and
- Evaluation of effectiveness and revision of plans, as needed.

The iterative nature of the watershed approach encourages partners to set goals and targets and to make maximum progress based on available information while continuing analysis and verification where information is incomplete.

How can a Watershed Approach assist states and localities in conducting source water assessments and implement SWP programs?

Information needed for source water assessments may be available from other watershed assessments among different programs (e.g., TMDL assessment, see below for others). Integrating SWP programs into watershed protection efforts, and targeting source waters as high priority areas for protection by various federal, state, local and volunteer programs, will result in better understanding of the most critical pollutant sources, lead to more efficient use of resources, and improve the likelihood of sustaining long-term improvements.

How can source water assessments assist state and local watershed protection programs?

Assessments that identify source water priorities can be integrated into other watershed protection efforts like point and nonpoint source pollution control, wetlands protection, waste management, air pollution, and pesticide management. This integration of efforts will allow various watershed stakeholders to look for opportunities to leverage limited resources to meet common goals.

CSGWPPs, as part of the Watershed Approach, will use the assessments for WHPAs and certain recharge areas to better target federal and state ground water protection programs to these high priority areas. Maps for these areas will be prepared by the states so that all programs will know their exact locations.

Key watershed protection decision makers at the state and local levels: State and local public health, environment, and natural resources agencies, PWSs, industry and agricultural sector representatives, citizens groups, and tribes all contribute to collaborative decision making.

For more information on watershed efforts visit EPA's homepage [http://www.epa.gov/owow/watershed/].

Clean Water Act State Revolving Fund

How can the CWSRF assist states and localities in conducting source water assessments and implementing source water protection programs?

As discussed previously, the CWSRF provides a powerful partnership between EPA and the states, providing states with flexibility to fund projects that will address the highest priority water quality needs. While traditionally used to build or improve wastewater treatment plants, loans available under the CWSRF are increasingly being used for agricultural, rural, and urban runoff control, estuary improvement projects, and wet weather flow control (including stormwater and sewer overflows). As they evaluate source water assessment and protection options, states may consider how to access the CWSRF and to make more specific drinking water protection objectives including, as appropriate, the states' CWSRF priorities.

Index of Watershed Indicators

The IWI is the first national effort to organize aquatic resource information and present it at the watershed level. The Index is built on 15 different water resource indicators using information from a variety of public and private partners. Drawing on these indicators, the Index provides a description of the condition and vulnerability of each of the 2,111 watersheds in the coterminous U.S. (Alaska and Hawaii will be added later.) IWI is designed so that national databases and the descriptions of each watershed are available on EPA's internet homepage under the "Surf Your Watershed" web site [http://www.epa.gov/surf/iwi.prev.html]. Using the Index, EPA hopes that citizens will better understand conditions in the watersheds where they live and be part of preserving or restoring healthy aquatic systems. This first effort to characterize watershed condition and vulnerability is a "work in progress" based on current data. EPA will periodically update IWI to reflect more current and complete data from other EPA offices, states, tribes, and others that have more detailed information, and to reflect development of new indicators not yet adequately covered, such as ground water.

The EPA drinking water program is actively involved in this initiative. One of the fifteen data layers is an index of several drinking water data sets to characterize source water condition. CWS inventory and violation data have been extracted from the Safe Drinking Water Information System (SDWIS) and is a key component of the watershed index being developed.

***How can IWI and the Surf Your Watershed web site assist states and localities in conducting source water assessments and implementing source water protection programs*?**

The IWI and *Surf* web site provide state and tribal water quality managers access to information not readily available anywhere else. First, IWI watershed profiles co-locate the CWSs at the watershed level with the other EPA data bases identifying point and non-point sources of contamination of ambient ground and surface waters. This gives states and others ready access to data on potential source water pollution *on a geographic basis*. Second, IWI includes a separate source water assessment data layer which combines three data sets into a single index to characterize source water condition. The initial IWI release shows that 60% of the watersheds rated show some degree of impairment for public water supply use.

IWI and the analytical tools (including GIS) available on the *Surf* web site provides a starting point to identify locations of the most serious water quality problems and where further assessment, monitoring, education, and protection programs need to be focused.

Because data will be geo-referenced and accessible through the use of the *Surf* data management tools, states and localities will be better able to display the condition and vulnerability of drinking water intakes/ wellheads and focus on the need for protection measures. IWI and *Surf* may in the future be expanded to include protection measures that are in place in the watershed.

How can the source water assessments improve the utility of IWI and the Surf Your Watershed web site?

The initial release of *IWI* provides only a watershed-level assessment of the condition and vulnerability of the water resources. The initial IWI also uses *surrogate* measures of source water condition that are of limited utility on a watershed-by-watershed basis. The source water delineations and assessments will supplement existing data sources and provide for the first time a comprehensive characterization of the risk to drinking water sources in the watershed. This will allow EPA and states to better target CWA

program resources to improve watersheds at risk.

Clean Water Act Monitoring and Data Management Programs

Section 305(b) of the CWA requires states to report to EPA on the condition of their waters. States conduct ambient water monitoring to determine the quality of their waters, changes in water quality over time, the causes of water quality problems, and if pollution control programs are working. Water monitoring data are compared to state standards to determine the extent to which waters meet designated uses, including drinking water supply. States use their 305(b) water quality reports to communicate findings to the public and to better manage their water programs. The national summary of these state reports is presented in a report to Congress and its conclusions about sources and causes of pollution help determine where to focus national water pollution control efforts and resources. The report also includes information on state and tribal water pollution and drinking water programs and special human health and aquatic life issues.

EPA produces a variety of monitoring tools such as technical methods and protocols, as well as guidance recommending baseline state monitoring program components to be implemented. Monitoring is also conducted under the CWA's NPS Program (section 319), the National Estuary Program (NEP) (section 320), the Clean Lakes Program (section 314), and through various special studies and programs.

EPA's data management program for ambient water quality is centered on EPA's STOrage and RETrieval system (STORET). This database contains decades of raw surface and ground water data. Much of the raw data analyzed for the 305(b) water quality reporting process is stored in STORET.STORET, which is available at EPA's website at [http://www.epa.gov/owow/storet/]. STORET is currently being modernized to more effectively handle the complex needs of the nation's evolving monitoring programs with the help of the National Water Quality Monitoring Council, a consortium of public and private monitoring agencies. EPA and the USGS are co-chairs of the council.

EPA's information on water discharges permitted by NPDES is included in its Permit Compliance System (PCS) database.

How can EPA monitoring and data management programs assist states and localities in conducting source water assessments?

Source water assessments are not intended to involve substantial amounts of new,

ambient monitoring. Any monitoring undertaken for assessments must be economical and effective; cooperative work with existing state monitoring programs will ensure that duplication of monitoring effort is not occurring, and that any new data that are collected are appropriate and credible. Coordination with the EPA data management staff will ensure that all needed data storage capabilities for SWP efforts can be included in the modernized STORET system.

For those source waters that need additional pollutant occurrence data, EPA's technical monitoring tools (e.g., monitoring protocols and guidance documents) may be useful.

In 1994, EPA asked states to prepare multi-year state water monitoring strategies addressing core program elements, including integration with program-specific monitoring such as source water or NPDES. EPA will continue to work with the states to produce comprehensive, multi-year monitoring strategies that can serve as a base for SWAPs, and at minimum may be closely linked with monitoring and assessment of specific source waters. Guidelines for the 1998 305(b) report calls for states to include plans of how they will achieve comprehensive monitoring coverage of their waters, including assessment for drinking water designated use where applicable.

The modernized STORET data management system will be able to handle information generated by source water assessments. A vast array of information on data owners, project and survey types, field activities, sampling stations, types of samples, and sampling results will be storable and accessible in the modernized STORET, along with quality assurance checks to ensure the reliability of the information.

EPA's Water Body System allows states to submit and store their CWA 305(b) data in electronic form, including information on whether waters designated for drinking water can meet that use.

EPA is also working to strengthen state georeferencing capabilities to better track monitoring information for mapping and GIS applications. GIS tools, including the USGS HUC codes and EPA's hydrological Reach File 3 system that assigns unique locational identifiers to the waters of the U.S., will be valuable in source water assessments. For Reach File 3 coverage, call the STORET hotline at 1-800-424-9067.

How can monitoring and data management programs assist states and localities in implementing source water protection programs?

Monitoring data collected under the various programs cited above, using a broad variety of technical monitoring tools, will allow SWP program managers to 1) characterize waters; 2) identify problems; 3) design programs; 4) measure the effectiveness of their efforts; 5) identify resulting trends; and 6) direct resources to areas of greatest need. Similarly, EPA's data management systems will allow analysts and decision makers easy access to monitoring information, are flexible to varying data requirements, and ensure that the data stored are of documented quality. This may help implement the most effective controls and management practices in source water protection areas.

How can source water assessments assist monitoring and data management programs?

Information about source water quality is a valuable data layer to be added to monitoring data collected by state and federal agencies, and thereby improve state and national assessments of water quality. The water environmental indicators reporting project at the national level and at the watershed level (through the IWI) includes SWP data, and the source water assessments will make that data more robust.

Key decision makers for monitoring and data management at the state and local levels: State 305(b) water quality assessment coordinators, monitoring program managers and computer information services providers. Staff who design performance partnerships are also critical, since it is monitoring that provides the information to assess results. For more information visit EPA's homepage [http://www.epa.gov/owow/monitoring/].

Nonpoint Source Program (NPS)

Under section 319 of the 1987 CWA amendments, states were: (1) required to conduct statewide assessments of their waters to identify those that were either impaired (did not fully support state water quality standards) or threatened (presently meet water quality standards but are likely not to continue to meet water quality standards fully) because of NPSs; (2) required to develop NPS management programs to address the impaired or threatened waters identified in their nonpoint assessments; and (3) entitled to receive annual grants from EPA to assist them in implementing their NPS management programs once EPA had approved the assessments and programs.

EPA has approved the assessments and management programs for all states and Territories. Many states are in the process of revising their management programs.

Through FY 1997, a total of $571.5 million has been awarded to the states, Territories, and some Indian tribes to help implement their NPS programs. The current national guidance for this program was released in May, 1996.

In 1990, as part of the CZARA, Congress required all states (29) with federally approved Coastal Zone Management Act programs to develop coastal NPS programs. These programs, currently being jointly approved by EPA and the National Oceanic and Atmospheric Administration (NOAA), provide for implementation within coastal watersheds of management measures specified by EPA and incorporate policies and mechanisms, enforceable at the state level, to ensure implementation of the specified measures.

How can the nonpoint source program assist states and localities in conducting source water assessments?

Some assessment activities may be eligible for section 319 funding. In addition, the assessments developed for the NPS programs may serve as valuable sources of information and data about land-based pollution sources which may now or in the future contribute to the contamination of drinking water intakes and wells, and identify both surface waters known or suspected of being contaminated by NPS pollution. In most states, the NPS assessments have been incorporated into the National Water Quality Inventory (305(b) Report) and are consequently updated periodically as part of each state's overall water quality assessment.

How can the NPS program assist states and localities in implementing source water protection programs?

Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters (EPA, Office of Water, 840-B-92-002, January 1993) [http://www.epa.gov/owow/nps/coastnps.html] summarizes management measures for preventing and reducing NPS impacts on surface and ground waters, and is applicable to inland as well as coastal NPSs (agriculture, forestry, urban runoff, marinas, hydromodification, wetlands protection). The guidance may prove valuable to states and localities in developing programs and strategies to protect drinking water sources from land-based contaminants. Furthermore, the section 319 funds awarded to states to assist them in implementing their NPS management programs have been used to implement measures to protect drinking water sources where such activities are described or referenced in the state's NPS management program. Roughly half of each state's 319 grant award is passed through to local groups and organizations for on-the-ground implementation

activities. Additionally, the enforceable policies and mechanisms incorporated in state coastal NPS programs could be used for SWP programs in coastal areas.

How can Source Water Assessments assist state and local Nonpoint Source Programs?

As mentioned above, NPS assessments are periodically updated as part of the National Water Quality Inventory. Federal, state and local assessment resources are typically insufficient to address all waters. Consequently, these updates must make use of information and data from many different organizations and agencies. Information and data from source water assessments would help most states expand coverage of state water quality assessments, and would result in more effective use of federal, state and local resources to improve and protect surface and ground waters for all uses.

Key Decision Makers for Nonpoint Source Programs at the state and local Levels: There is a NPS coordinator in each EPA region, and one in each state. This coordinator is usually part of the state's water quality agency, although in some cases they may be in the state's conservation or agricultural agency. Increasingly, decisions about funding and program priorities are made by a broad-based NPS Task Force representing state agencies as well as other stakeholders. For more information visit EPA's homepage [http://www.epa.gov/owow/nps/].

Total Maximum Daily Load Program

The TMDL Program is a planning program that identifies waters still needing attention to meet water quality standards. Under the CWA's section 303(d), states are required to identify waters that do not meet water quality standards, even after the implementation of nationally required levels of pollution control technology, and to develop TMDLs for those waters, with oversight from EPA. The law also requires states to establish a priority ranking for their waters needing TMDLs. TMDLs allocate pollutant loadings among pollution sources in a watershed, and provide a basis for identifying and establishing controls to reduce both point and NPS pollutant loadings.

How can the TMDL program assist states and localities in conducting source water assessments and implementing source water protection programs?

State lists that identify waters needing TMDLs, and TMDLs developed for specific water bodies, are a useful source of information for the development of source water assessments. Section 303(d) lists identify waters not meeting water quality standards due to a particular

pollutant or stressor; this type of information will be helpful for identifying contaminants of concern for source waters. TMDLs for particular water bodies generally provide more detailed information about the sources of the pollution and can be used to develop allocation scenarios for pollutant loadings among pollution sources in a watershed. For source water serving as a public water supply, the data developed as part of the TMDL assessment can provide a basis for implementing local SWP programs.

How can source water assessments assist state TMDL programs?

State TMDL Programs are required to use all "existing and readily available" information in developing section 303(d) lists and source water assessments may provide additional data upon which to base listing decisions and also to develop TMDLs for a particular water body. For example, since TMDLs are developed for specific pollutants or stressors, identification in source water assessments of contaminants of concern in a particular source water protection area would be helpful to state TMDL programs.

Key decision makers in the TMDL program at the state and local Levels: State TMDL programs are generally managed by state water quality agencies. At the local level, a variety of stakeholders may be involved including local and regional governing agencies, point sources, farmers, foresters, land developers, city and state planners, and local environmental organizations. For more information visit EPA's homepage [http://www.epa.gov/owow/tmdl/index.html].

National Estuary Program

The NEP was established under the 1987 CWA amendments to protect and restore the health of estuaries while supporting economic and recreational activities. EPA helps create local estuary programs (referred to as "NEPs") by developing partnerships between government agencies, who oversee estuarine resources, and the people who depend on the estuaries for their livelihood and quality of life. These groups plan and implement programs according to the needs of their own areas. To date, 28 local programs are demonstrating practical and innovative ways to revitalize and protect their estuaries.

For each local NEP program, multi-interest working committees and an overall management conference address characterization (biological, geophysical, chemical, and social parameters) of the estuary and its watershed, the priority problems for the estuary, actions to correct the priority problems, and ways to finance the actions. As a result of this work, detailed comprehensive management plans

are produced by all programs. Regional assessments must be conducted to assist coastal communities with planning their future growth.

How can the NEPs assist states and localities in conducting source water assessments and implementing source water protection programs?

During development of their comprehensive conservation and management plans, most NEPs have identified priority problems threatening the estuary (e.g., contamination from onsite disposal, excessive population growth, overpumping of the aquifer, saltwater intrusion). Many of these problems may threaten local source water. States and localities can get a head start on their own source water assessments by using the information compiled by the NEP.

Most NEPs currently include partners such as NOAA whose programs under the Marine Protection, Research, and Sanctuaries Act include protection efforts for surface waters. Integrating SWP programs into state and local NEP committees will raise awareness among various stakeholders in the estuary and can result in cost savings by building upon the financial resources and willingness of the people with interests in the estuary's watershed to take action.

How can source water assessments assist individual NEPs?

Although most NEPs focus priority attention in other areas, SWP is also of concern. The inherent vulnerability of drinking water sources in coastal areas to over use and contamination has been amplified by the rapid growth seen in these areas. The finished source water assessments will provide valuable information to the NEPs and their stakeholders, enabling the evaluation of efforts undertaken by the local programs to reduce threats to source waters. For example, coastal communities most often do not control the water quality of the deep supply aquifers. With assessments in hand, local and state officials can plan together to protect recharge areas.

Key decision makers for the NEP at state and local levels: During the planning phase, each NEP establishes a management conference which typically includes a policy committee, management committee, scientific/technical advisory committee, and a citizens advisory committee. Committee representatives include individuals from EPA and other federal agencies, state, regional, and local government agencies, environmental groups, educational institutions, local industries, and the general public. To locate contacts for a specific program, consult the NEP Homepage

[http://www.epa.gov/owow/estuaries/nep.html] or call the state coastal or marine affairs agency, or call the main National Estuary Program office at 202/260-1952.

Clean Lakes Program

The Clean Lakes Program is one of the earliest programs to use the watershed protection approach in monitoring and restoration activities to control a wide range of pollution sources. The program has provided more than $145 million over 20 years under CWA section 314 to support grants and cooperative agreements for priority lake monitoring, assessment, and protection projects in all areas of the country. For more information on the Clean Lakes Program and other lakes information, visit its internet homepage at: [http://www.epa.gov/OWOW/lakes].

How can the Clean Lakes Program assist states and localities in conducting source water assessments and implementing source water protection programs?

Many lake assessment and restoration activities have been conducted under the Clean Lakes Program and information from these studies could be useful in developing source water assessments for specific lakes used as source waters. Clean Lakes Program statewide lake assessments and Phase I studies for particular lakes may be of greatest help in assessing lake conditions. Phase II projects support implementation efforts and are sometimes followed by Phase III post-restoration monitoring projects. A particular lake may have only a Phase I project completed or in some cases may have all three phases completed.

How can source water assessments assist state Clean Lakes Programs?

New analyses conducted for lakes under the SWAP could better characterize the vulnerability of important lakes, and thereby reinforce the need for additional lake restoration and protection activities. Documentation of these vulnerabilities would hopefully spur action at the local and state level. Some of these needs can be addressed through section 319, CWSRFs, as well as state-funded lake programs.

Key decision makers in the Clean Lakes Program at the state and local levels:
State lake programs are generally managed by state water quality agencies. At the local level, a variety of stakeholders may be involved including local and regional government agencies, lake associations and lakeshore residents, and local environmental organizations.

Wetlands Program

The U.S. EPA, in partnership with other federal agencies, and state, local, and tribal governments is responsible for restoring and maintaining the chemical, physical, and biological integrity of the nation's waters, which include wetlands. Section 404 of the CWA, which is jointly administered by the U.S. Army Corps of Engineers and EPA, establishes a program to regulate the discharge of dredged or fill material into waters of the U.S. While the section 404 program commonly regulates the discharge of dredged or fill material on a case-by-case basis, provisions found within this authority can allow for the regulation of aquatic resources in a more comprehensive manner. Some examples include watershed planning, special area management planning and advanced identification.

EPA's Wetlands Program has made efforts to integrate wetlands protection into existing EPA programs (e.g., CWA). In addition, some states have developed or are developing State Wetlands Conservation Plans (SWCPs) which provide a framework for integrating wetland programs across many state programs. The EPA Wetlands Program has experience in providing assistance for the development of comprehensive wetlands plans, participating in efforts to develop such plans, and reviewing plans for other state and local programs.

How can wetlands protection assist states and localities in conducting source water assessments and implementing source water protection programs?

Wetland protection programs often need to assess the overall health of watershed ecosystems in order to estimate the impacts of proposed man-made changes to wetlands and other waters. Assessments undertaken by federal, state, and local governments for the purpose of protecting wetlands can provide information that may be useful for source water assessments.

Wetlands can provide a wide range of different functions and benefits to local communities including the interception and filtration of pollutants thereby improving source water quality and possibly reducing treatment costs. Constructed wetlands can improve source water quality for downstream rivers. Integrating wetlands protection and restoration into source water programs can highlight the importance of targeting wetlands and source waters as high priority areas for protection and can reduce duplication of efforts and conflicting actions.

How can source water assessments assist wetlands protection?

Source water assessments can identify critical wetlands where the enhancement or

restoration of wetlands can improve water quality in the watershed.

Key decision makers for wetlands protection at the state and local levels: EPA Regions, and state/tribal/local natural resources/water agencies. For more information visit EPA's homepage [http://www.epa.gov/owow/wetlands/].

The National Pollutant Discharge Elimination System (NPDES) Program

Under the authority of the CWA, the NPDES program regulates point source discharges to surface waters such as wetlands, lakes, rivers, estuaries, bays, and oceans. Point source discharges include wastewater from industrial processes, effluent from municipal wastewater treatment plants, industrial and municipal stormwater, combined sewer overflows, and sanitary sewer overflows. The NPDES program also regulates biosolids (the semi-solid residue from wastewater treatment processes) to ensure that they are handled properly and manages the national pretreatment program to reduce the level of pollutants discharged by industrial facilities into municipal sewage systems.

Permits regulate discharges with the goal of ensuring protection of human health and aquatic life. If regulated facilities fail to comply with the provisions of their permits, they may be subject to enforcement actions. EPA and the states use a variety of techniques to monitor permittees' compliance status, including on-site inspections and review of data submitted by permittees.

How can the NPDES program assist states and localities in conducting source water assessments and implementing source water protection programs?

In the approximately 25 states that have developed or are developing statewide watershed management frameworks, where water management program activities are coordinated around delineated watersheds and sub-watersheds consistent with the Watershed approach discussed earlier in this chapter (including both surface water drainage areas and connections to aquifers), information useful for source water assessments should be available.

Recently, the NPDES program has initiated discussions on development of a single mechanism (a "watershed permit") that could address multiple pollutant sources within a watershed. A framework for "watershed permitting" is the next logical step in fully integrating the NPDES program within an overall watershed approach. Implementation of a watershed permit would include local watershed monitoring, assessment, and planning to determine appropriate, enforceable, local

control actions (including NPS controls). Source water assessments can be a part of such an overall watershed assessment and planning effort. Also, the NPDES program has convened a Federal Advisory Committee to advise EPA on strategies to control urban wet weather point sources (i.e., stormwater, combined sewer overflows, sanitary sewer overflows). EPA, in cooperation with the Urban Wet Weather Flows Federal Advisory Committee, is developing guidance on local watershed assessment and planning that may be useful for source water assessments.

Finally, monitoring requirements associated with the NPDES program provide a number of opportunities for obtaining data useful for source water assessments. Permits may contain effluent, ambient, and biosolids monitoring requirements that would be critical in identifying the presence and origin of contaminants in a delineated source water area. EPA and the Urban Wet Weather Federal Advisory Committee are developing recommendations and guidance on coordinating watershed monitoring data within the framework of a watershed plan. The final document may consider source water assessment needs when providing guidance on monitoring for watershed planning and assessment and recommendations for monitoring requirements for NPDES permits.

The requirements of EPA storm water general permits typically require industries to conduct an inventory of all sources of storm water contamination on the industrial property for determining pollution prevention opportunities. These inventories may be a useful source of information if requested by the NPDES permitting authority and assembled and analyzed on a watershed basis. In cases where industries have spills of hazardous substances, EPA storm water general permits require that these spills be reported which may be an additional source of useful information.

EPA storm water general permits also require certain industries to monitor their storm water runoff for pollutants of concern that may be generated by the industrial operations. Typically, the industries that are required to monitor are those with a high level of exposure of sources of industrial pollutant to rainfall or runoff.

In the cities and counties regulated under the NPDES storm water permitting program, storm water management programs are developed to minimize storm water contamination in the runoff being discharged from the municipal storm sewer systems. All regulated municipalities are required to implement a storm water monitoring program during the five year

term of their permit. These monitoring programs may generate significant amounts of useful surface water quality data, especially in those watersheds where surface water runoff is the primary source for drinking water reservoirs, or where drinking water aquifers are recharged by storm water runoff. Where this is the case, some municipalities have designed their entire storm water management program around the effort to protect the drinking water resource (Austin, Texas; Fairfax County, Virginia).

As states and localities move beyond the assessment phase to implementation of SWP measures, NPDES permits will be key measures for ensuring control of contaminants that could threaten PWSs. The NPDES program provides enforceable regulatory requirements that can be designed to meet the goals of a SWP program. Regulation of individual wastewater discharges and of the use and disposal of biosolids are critical means of ensuring attainment of water quality standards applicable to public water supplies and other SWP goals. In addition, the concept of a "watershed permit" may provide the means for aggregating contaminant assessments and requirements for point and NPS control measures on a watershed basis in order to achieve these goals.

How can source water assessments assist the NPDES program?

Permit writers often must determine where water quality-based permit limits are needed and then develop limits based upon sparse data. Source water assessments can provide a means to collect information from other existing data sources on ambient levels of contaminants, and significant potential sources of contaminants developed in the assessment itself, that could be used to assess the need for permit limits for individual contaminants and to calculate such limits. Also, the conditions in a "watershed permit" could be based, in part, on the information gathered in a source water assessment and goals identified as a result of the source water assessment.

Key decision-makers for the NPDES program at the state and local levels: There are 43 states and territories authorized to implement the NPDES program. In these states, the program generally is implemented by the state water quality agency. Typically, this agency also is responsible for water quality planning, setting water quality standards, and enforcement, all programs with critical links to the NPDES program. In states and territories that are not authorized to implement the NPDES program, EPA is the permit-issuing authority. In these

states, EPA works closely with state agencies that implement related programs.

In addition to state authority, cities with municipal wastewater treatment plants covered by the pretreatment program are authorized to establish pretreatment requirements to reduce the level of pollutants discharged by local industries into municipal sewage systems.

Sole Source Aquifer Protection Program

The SSA Protection Program is authorized under section 1424(e) of the SDWA. The provision allows EPA to declare that an aquifer is a "sole or principal drinking water source" for an area if contamination of the aquifer could create a significant hazard to public health. A sole source aquifer designation can be initiated by a petition submitted to EPA from any interested party, such as a public water purveyor, local health department, or an environmental group. Following a designation, federal financially assisted projects proposed over the aquifer are subject to EPA review. EPA can negotiate modifications to improve a project or even deny funds to a project which poses a significant risk to public health by contamination of the sole source aquifer.

How can the Sole Source Aquifer Protection Program assist states and localities in conducting source water assessments and implementing source water protection programs?

The hydrogeologic and water usage information assembled by EPA during the designation process can aid in defining protection areas and determining the susceptibility of water supplies. Project reviews can be a source of information on potential contaminant sources within source water protection areas.

A sole source aquifer designation can increase community awareness on the use, value, and vulnerability of aquifers and build support for implementing various ground water protection efforts. Project reviews can often lead to direct technical assistance by identifying specific activities that may lead to ground water contamination. In addition, technical assistance usually involves site-specific coordination of ground water protection activities between state and local environmental and public health protection agencies. Since the program focuses specifically on ground water and can cover many types of activities that may impact ground water quality, it offers an added level of protection for projects which might not be fully addressed through normal federal environmental/public health impact evaluations.

How can source water assessments assist Sole Source Aquifer Protection Programs?

The information from source water assessments can be used to help evaluate whether an area meets SSA designation criteria, and can provide useful information for project reviews, such as the location of delineated source water protection areas, potential or existing sources of contamination, and local variations in aquifer susceptibility.

Key decision makers in the Sole Source Aquifer Protection Program at the state and local levels: Although project review authority cannot be delegated, EPA collaborates with state and local entities, such as health, environmental and planning agencies, to help evaluate whether proposed federally-assisted projects may endanger drinking water supplies and to develop appropriate mitigation measures. In most cases, the key decision makers are the state and local agencies or organizations that petition EPA for an SSA designation.

Other Water Programs

Other CWA programs may be useful for states in developing source water assessment/protection programs. For example, under section 312(f)(4)(B) of the CWA, states may apply to EPA to establish drinking water intake zones in surface waters and prohibit the discharge of sewage from boats or other watercraft within those zones. Other programs will be addressed in more detail in subsequent guidance.

III. LINKAGES TO OTHER EPA PROGRAMS

Numerous laws in addition to SDWA and the CWA provide EPA and states with authority to establish programs related to preventing or remediating contamination of ground water or surface water supplies. These programs, listed below, may represent additional sources of information and expertise for states and localities to use in conducting source water assessments. For example, regulations under the RCRA Correction Action Program require remediation for releases of hazardous waste and hazardous constituents at facilities seeking permits to treat, store, or dispose hazardous waste. These regulations contain an aquifer assessment component that could help identify wells at risk of contamination from landfill leachate, for example. In some cases, collaboration with federal or state agencies responsible for these programs could also save costs associated with SWP programs. These programs, and the linkages with SWP, will be addressed in detail in subsequent guidance.

- Pesticide SMP Program
- Pollution Prevention Program
- Radiation Program

- RCRA Subtitle C and Subtitle D Programs
- Superfund Program
- Toxic Substances Control Program
- TRI Program
- UST Program
- Emergency Planning and Community Right-To-Know Act (EPCRA)
- FIFRA
- Coastal Zone Act (CZARA)
- Great Lakes Program

The National Environmental Policy Act (NEPA) requires an Environmental Impact Statement (EIS), and public participation in its review, prior to approval of any project involving federal funding. Most states also require EISs for state-funded projects. Important information useful for source water programs may be contained in EISs on local drinking water supplies, and their susceptibility to point and non-point sources.

IV. LINKAGES TO OTHER FEDERAL PROGRAMS

Most federal programs based on development or conservation of natural resources have some connection to water quality protection. A key element of a successful state or local source water program is to build partnerships which direct available resources towards the specific task of protecting drinking water sources. Unfortunately, the variety of federal laws intended to protect water quality and public health in some cases can appear to create a maze of overlapping, and sometimes conflicting, programs. Briefly described below are some of the federal programs that have resources, information, and expertise that states should consider in advancing their source water assessment and protection programs.

This is not intended to be an exhaustive compilation of all relevant linkages. EPA, with participation by a wide range of stakeholders, will be writing a more detailed description of the various program level activities and contact information will be available in a subsequent guidance.

Prior to writing this next guidance, EPA has been collating information provided by other federal Programs. EPA has, informally at the staff level, asked agencies to identify:

- The activities and programs that have the strongest bearing on source water assessments and protection;
- How the agency can assist states implement source water assessment and protection programs?
- How source water assessments can be useful to the Agency's efforts and priority setting efforts;

- Who may states contact within the agency to coordinate source water activities;

- Who are other Stakeholder's with a primary interest in the agency's activities?

This information will be part of the next guidance which, when completed, will be widely distributed, including making it available on the OGWDW homepage with links to other internet resources.

U.S. Department of Agriculture

Established by the 1985 Farm bill, "State Technical Committees" are a potentially important forum for coordination between USDA conservation programs and state and local SWP effort.

State Technical Committees provide advice to USDA's Natural Resource Conservation Service on conservation measures. The Federal Agricultural Improvement and Reform Act of 1996 P.L. 104-127 ("Farm Bill") authorizes these committees to make recommendations to state conservationists (the lead NRCS officials in the states) on several source water-related activities under the Environmental Quality Incentives Program (EQIP), including the following:

- Selecting and ranking of priority areas
- Selecting significant statewide natural resource concerns
- Guidance on eligible conservation practices
- Technical guidance on conservation practices, including new, innovative practices
- Coordinating with other federal, state, tribal, local public and private activities as they relate to EQIP.

State water agencies may serve as members of the State Technical Committees and the local work groups convened by local conservation districts to advise NRCS regarding the implementation of EQIP. Local work group membership may include federal, state, tribe, county, or local government representatives. These work groups may provide advice on source water-related activities similar to those listed above, including identifying priority areas, developing priority area proposals, describing the conditions of the natural resources and the environment, identifying eligible conservation practices, detailing the need for new, innovative conservation practices, and recommending representatives to serve on multi-state committees. Aside from serving as members, any federal, state, or local government agency, Indian tribe, or private group or entity may identify geographic areas to the local work groups for priority

area consideration. Through both the state and local committee meetings, state water program officials will have great opportunities to integrate source water assessment and protection objectives with USDA conservation program concerns. For the phone numbers of state NRCS Offices on the internet, enter the specific NRCS address, as follows: [http://www.nhq.nrcs.usda.gov/ITD/fax/fax-stat.html]

A number of USDA programs enhance SWP including state groundwater management plans, voluntary agricultural RMPs—also known as whole farm or ranch management plans—and the following programs administered by USDA's Natural Resources Conservation Service and the Farm Service Agency (FSA):

- The CRP temporarily retires environmentally sensitive crop land (based on erosion potential, threatened wildlife habitat, risk to water quality) and assists farmers with conservation practices (e.g., filter strips, windbreaks, riparian buffers, grazing restrictions);

- The Wetlands Reserve Program provides financial assistance to landowners to restore and protect wetlands in exchange for retiring marginal agricultural land.

- EQIP, discussed previously, provides long-term technical, financial, and educational assistance to ranchers and farmers for conservation practices (e.g., integrated pest management, grassed waterways, filter strips, management of nutrients, manure, grazing, and irrigation water, capping abandoned wells) where there are critical water quality and other environmental problems.

- Swampbuster Program to discourage conversion of wetlands to croplands.

- Sodbuster Program to conserve highly erodible land brought into crop production.

- Conservation Plans require producers to describe conservation practices for highly erodible cropland.

- Other programs including Conservation Farm Options, Flood Risk Reduction, Farmland Protection Program, Everglades Ecosystem Restoration, Wildlife Habitat Incentives, Conservation of Private Grazing Land, Commodity Credit Corporation, and purchase of floodplain easements under the

Emergency Watershed Protection Program.

States can use these programs to enroll and protect environmentally-sensitive land that impacts drinking water supplies and to find cost-effective solutions to source water problems attributable to agriculture. Further, FSA can help states identify already enrolled land which falls within delineated areas. Designated WHPAs already receive special consideration. In addition, by designating certain geographic areas as Conservation Priority Areas (CPA), states can ensure that all cropland within that area is eligible for enrollment in the CRP. Another provision of the CRP, the Conservation Reserve Enrollment Program (CREP), allows states to target CRP enrollments to address high priority resources such as delineated source water protection areas. The primary contacts for program information are available through state and county FSA offices. [http:.//wwwaix.fsa.usda.gov/areamap.html].

U.S. Department of the Interior

The **U.S. Geological Survey** has offices in every state and has interdisciplinary teams of scientists and technicians who can assist states with source water assessments. Federal matching funds are usually available from the USGS to match funding from state and local governments, including the State Revolving Funds.

Several studies involving source water protection area delineation and susceptibility analysis have been completed, and fact sheets are available on request. The following USGS programs can provide useful information for source water assessments:

- Federal-State Cooperative Program addresses data needs for water studies of interest at state and federal level.
- USGS Drinking Water Initiative applies USGS data and expertise to drinking water related issues.
- National Water Quality Assessment is a federally funded comprehensive water-quality studies of 55 major watersheds nationwide.
- National Stream-Quality Accounting Network collects water quality data at fixed sites on major rivers nationwide.
- National Water Quality Laboratory analyzes full range of contaminants, with extremely low detection limits, for detection of trends invisible when normal detection limits are used.
- Toxic Substances Program studies fate and transport of toxic materials.

- Data collection, storage, and retrieval—The USGS routinely collects and stores a vast amount of data on streamflow, aquifers, and water quality.

- GIS— Most spatial data at USGS are stored in digital form, and can be used in a GIS.

USGS can **delineate** drainage areas for surface water and contributing areas for wells. For larger drainage basins, delineations are already available in USGS hydrologic unit maps. (See Chapter 2 for details.) Some GIS layers are available to **identify** certain types of potential **sources** of contamination. USGS can also work with states to produce the required maps. The internet address to download the HUC boundaries is [http://nsdi/usgs.gov/wsdi/wais/water/huc250.htm/#section6.] USGS can use existing and new studies of watersheds, aquifers, land use, and contaminant fate and transport to determine **susceptibility** of drinking water sources to contamination. The USGS can also **sample** streams and wells to determine occurrence patterns and trends in contaminant concentrations. Such studies in Washington and New Jersey have resulted in savings, in the form of monitoring waivers, that more than covered the cost of the studies. Finally, USGS can participate in scientific review of source water protection. For national inquiries related to drinking water, contact: Glenn Patterson, USGS, Drinking Water Coordinator, 412 National Center, Reston, VA 20192, Phone 703-648-6876/Fax 703-648-5722
E-mail gpatter@usgs.gov
For inquiries related to a particular state, use the list of USGS state representatives at [http://water.usgs.gov/public/staterep.html].

The **U.S. Fish and Wildlife Service** has a National Wetlands Inventory Project that provides maps and digital wetland data with site specific classification and locational information communities need to protect the wetlands that are protecting, maintaining, and improving their surface water quality. Wetland maps are a prerequisite for watershed planning. Draft or final maps are available for 88 percent of the conterminous United States, 30 percent of Alaska and all of Hawaii. Ordering information for paper maps is available by calling 1-800-USA-Maps. Over 20,000 maps have been digitized and are available to the public through the internet from the National Wetlands Inventory's web site [http://www.nwi.fws.gov], or by phone (800-USA-MAPS).

Other relevant agencies within DOI include Bureau of Land Management (BLM), the National Park Service, the Regional

Aquifer System Analysis (RASA) program, Bureau of Reclamation, and Office of Surface Mining OSM). For example, many Park Service Units have extensive surface and ground water data and operate GIS systems that can facilitate the interpretation and availability of such data. Also, the Bureau of reclamation has developed projects and manages large volumes of water through storage reservoirs in the 17 western states for irrigation and domestic water supplies. The Bureau can be an important partner in coordinating source water assessments on interstate streams and in watershed management where these facilities have been constructed.

Department of Defense (DOD)

Implementation of DOD environmental activities is largely carried out by the four military services—Army, Navy, Air Force and Marines. States can coordinate their source water activities through DOD's Regional Environmental Quality Centers. The services have extensive data on existing sources of contamination associated with defense activities and bases and can work with the states to identify potential sources. Many bases have their own water supplies and have already implemented extensive WHP activities.

Department of Transportation (DOT)

DOT and its agencies support the development of transportation infrastructure and implements programs relevant to SWP. For example, the **Federal Aviation Administration** is working with airports to use best management practices when using aircraft deicing agents and other chemicals. The **Federal Highway Administration** in cooperation with the states, administer the Federal-Aid Highway Construction Program which includes erosion control guidelines and, with EPA, is developing training in erosion control and non-point source pollution. The **U.S. Coast Guard** issues and enforces regulations for the safe transportation of oil and hazardous materials in bulk by water. The **Research and Special Programs Administration** is responsible for hazardous materials transportation (other than in bulk by water) and pipeline safety, transportation emergency preparedness, safety training, and multimodal transportation research and development.

Department of Energy (DOE)

DOE regulates all Atomic Energy Act related uses of radioactive materials at its sites. DOE sites prepare annual site environmental reports and annual environmental monitoring reports which contain detailed environmental information.

Each DOE site has a program in place for ground water and surface water protection from radiological contamination. State agencies seeking information on source water at DOE sites can contact the DOE Operations Office or the DOE area Office with responsibility for a given site. Names and phone numbers are available through the DOE Homepage at [http://www/doe.gov].

V. CONCLUSION

EPA has asked its other federal partners to assist states as they implement the new provisions of the new SDWA. EPA is encouraging federal agencies to use the information developed through SWAPs to target and prioritize their efforts and available funding to these areas. The Agency is also undertaking internal efforts to coordinate the SWAP provisions of the new SDWA with all relevant Agency programs.

In 1998, EPA will sponsor a federal round table to seek these objectives. The Agency plans to work with all federal partners to develop a more detailed guide on the useful linkages among programs to support source water assessment and protection efforts across the nation.

Appendices

Appendix A

EPA Outreach Process for Notice and Comment by Stakeholders on National Source Water Assessment and Protection Programs Guidance

EPA's planned effort to encourage stakeholder involvement and input in implementing policy is evidenced by the following list of meetings. Over a period of 9 months, EPA sponsored a variety of meetings, attended by over 2,000 people representing state agencies (drinking water, wellhead, agriculture and forestry), Federal Agencies (EPA, USDA/FS, NRCS, CREES, DOI/USGS), large and small water systems, environmental and public health advocates, "up stream" interests such as agriculture and chemical manufacturers as well as local, county and tribal officials. EPA Regional offices spearheaded 22 stakeholder meetings around the country to get input on the Guidance and to encourage stakeholder involvement in state program development. The discussions continued through all stages of the Guidance, beginning with a discussion guide and progressing through the draft Guidance to the final Guidance.

Stakeholder Meetings To Assist EPA With the Draft and Final Guidance:

- National Stakeholders Meeting—Approximately 150 people, representing National Organizations of States, Water Suppliers, and Environmentalists, Others (January 7/8, 1997 in Washington D.C.)

- 22 EPA Regional Stakeholders Meetings (April and May 1997)

- 3 Large Systems Seminars—AMWA representatives from PWSs serving over 50,000 people throughout the U.S. (December 1996 in Tempe, AZ; January 1997 in Portland, OR; April 1997 in New York, NY)

- 2 meetings of the National Drinking Water Advisory Council's Working Group on Source Water Protection—Approximately 25 members representing state agencies (drinking water, wellhead, agriculture and forestry), Federal Agencies (EPA, USDA/FS, NRCS, CREES, DOI/USGS), large and small water systems, environmental and public health advocates, "up stream" interests such as agriculture and chemical companies as well as local, county and tribal officials. (March 13/14 1997 and June 2/3 1997, both in Washington D.C.)

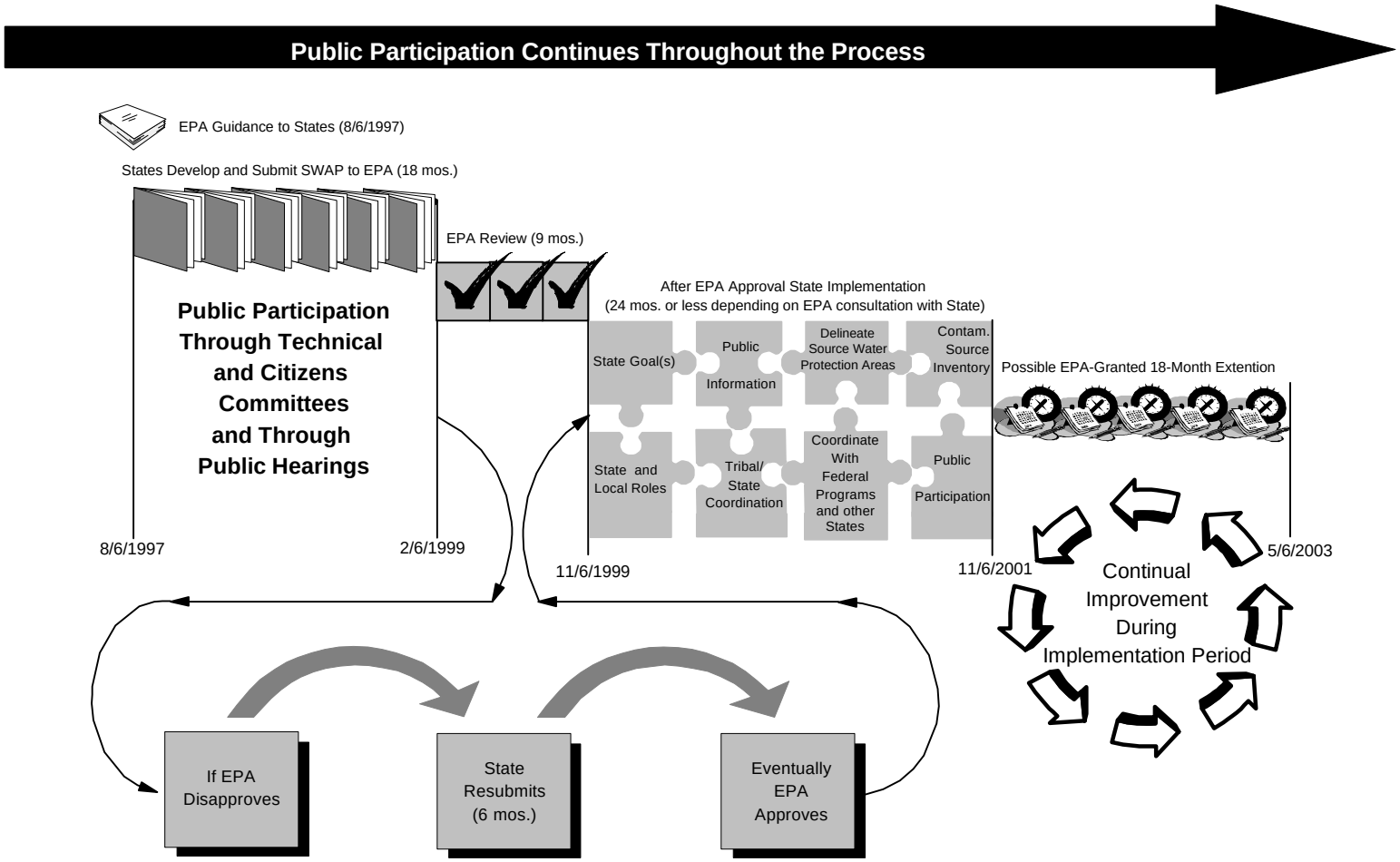
- Meeting of ASWIPCA, GWPC, and ASDWA on source water assessment and protection programs issues—Approximately 100 people representing 36 states. (June 24-25, 1997 in San Antonio, TX)

- NGA, ECOS, and ASDWA Meeting—Approximately 40 people representing 20 states to discuss implementation of Source Water Assessments and Protection Programs vis a vis CWA Programs. (Fall 1997)

Additional meetings will be held as States develop their programs. Check homepages for schedules and topic areas.

Appendix B

Process for State Submittal and Implementation of Source Water Assessment Programs



Appendix C

Enhancing Topographic Delineations for Source Water Protection Areas

As states delineate source water protection areas for surface-water based sources of drinking water, they may want to consider using buffer/setback zones, time-of-travel zones and/or use modeling techniques to enhance the delineation. These enhancements can assist states in defining "segments" for management actions. Below is information that can assist states in using these techniques.

Buffers/Setbacks

A typical buffer/setback zone for SWP is a strip of vegetated land generally 50 to 200 feet in width along the shore of a stream or reservoir that is upstream of a public water supply intake. Analogously a buffer/setback can be used for a reservoir. Determination of the width of buffer zones is often based on consideration of such factors as: the topography of the land, the local land uses, the political and legal feasibility of setting aside such buffers, slope, size of the stream and land ownership rights.

Surface water buffer zones and setbacks are often used as a means of reducing the adverse impacts of runoff on drinking water sources. The primary purpose of buffers/setbacks is to filter sheetflow and, to a lesser extent, encourage increased ground water infiltration. Buffer zones ("green areas") may be intended to serve several functions such as: wildlife habitat, stream bank integrity, protection of hyporheic zone for aquatic life, residential or commercial exclusion or SWP.

Time-of-Travel

The streamflow time-of-travel (TOT) approach facilitates heightened management of those stream reaches most critical to protecting drinking water intakes from upstream significant potential sources of contamination. This method also enhances delineations of source water protection areas by facilitating spill- and other emergency-response activities. This method does not delineate protection zones; rather, it calculates the TOT of flow in a stream between a drinking water

intake and a point(s) upstream. It is the streamflow TOT between the intake and the upstream point of interest that provides the opportunity for managers to enhance protection management of long-term potential contaminant sources and to respond to a contamination event. Use of this method would be of greatest importance for drinking water utilities tapping rivers or reservoirs designated for commercial transport and municipal and industrial wastewater discharges. Water quality flow models provide a means through which specific hydrologic, geographic, and water quality parameters can be used to estimate the travel time for a contaminant introduced into a river to reach a drinking-water intake and to estimate the level of contamination at that intake.

Modeling

Ground water discharge and surface runoff models may also be used to assess the potential impact of individual contaminant sources, and to identify watershed areas with the greatest potential impact on source water quality. Modeling can be used in conjunction with source water assessments to enhance source water quality protection efforts. Models should be validated for the settings in which they are used.

A variety of models has been developed to assess the impact of changing land use on surface water quality. Simpler models require less detailed, site-specific hydrologic information and provide more generalized and descriptive output. More complex models require more extensive input data and provide output with greater predictive capability and site specificity. Site specific output can provide locations of contamination sources and yield relatively accurate predictions of variable flows and water quality at any point in a watershed.

Contaminant source loading models estimate chemical loading rates to surface water. These methods are most useful for estimating variation in loading rates as a function of changing land uses within the watershed. For example, as shown in Figure C-1, land may be divided into residential, commercial-, industrial-, and agricultural-use parcels. If agricultural

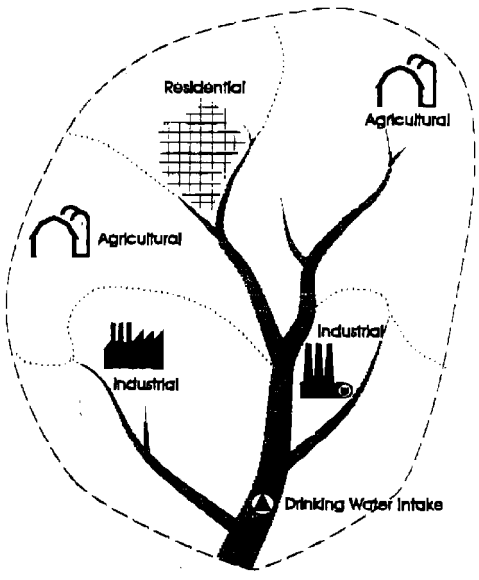


Figure C-1. Land Use Parcels

land is subdivided by soil type, crop type, and land management practice, the NPS loading rates for runoff, sediment yield, and ground-water discharge may be estimated for each parcel type. These parcel estimates are summed to obtain the total loading rate for the watershed or watershed areas.

Several states, local governments, water suppliers, and watershed management authorities have begun modeling to identify those land uses that have the greatest potential impact on source water quality. Modeling can identify areas within the watershed that may be incorporated into the source water protection area. Modeling can also be used to assess the impact of differing land management strategies within the source water protection area to foster more effective SWP.

Appendix D

Conjunctive Delineation of the Zone of Ground Water Contribution and the Area of Surface Water Contribution to Public Water Systems

There are numerous hydrogeologic settings where there is a significant hydraulic connection between a stream or lake and an underlying aquifer. Alluvial sand and gravel deposits within the floodplains and terraces of river valleys typically function as high yield aquifers and are commonly used to produce municipal supplies. Ground water in these deposits typically exhibits a strong degree of hydraulic connection with the stream. Along many reaches, stream water and ground water routinely move between the aquifer and the stream.

Ground water that occurs in fractured rocks in mountainous areas is also typically strongly connected to streams. Most of the flow in a mountain stream results from ground water discharge. Most of the water that infiltrates into fractured rocks above the stream valley will eventually discharge to the stream. To establish a source water protection area to protect public water supplies (PWSs) from all significant potential sources of contamination, it is important to determine if the PWS is providing water from both ground water and surface water sources.

Conjunctive delineation of source water protection areas is the integrated delineation of the zone of ground-water contribution and the area of surface-water contribution to a public water supply. States that choose to consider the hydraulic connection between ground water and surface water when delineating a source water protection area, will afford themselves the opportunity to reduce contamination from ground-water and from surface-water sources.

1. Considerations for Conjunctive Delineation for Systems Primarily Supplied By Surface Water

- Contaminants in ground water may ultimately be discharged into surface water. As ground water flows towards discharge points, the water is exposed to processes that provide some degree of in-situ remediation for many contaminants. The longer the ground-water travel time and the greater the distance between the site of contaminant entry to an aquifer and the site of potential discharge to surface water, the more likely that such contaminants will undergo some remediation before discharge. Persistence of contaminants in the subsurface and creation of toxic daughter products increase the need for source reduction and long travel-time and/or distance setbacks.

- The water supplied by a surface-water intake may have a significant ground-water component. In some locations, during part of the year, a major component of (and possibly all) surface water is ground water base flow. The USGS has estimated that about 40 percent of stream baseflow in the United States is ground water.

- The region (in the absence of engineered surface-water diversions) of surface-water contribution to a drinking-water intake is the total watershed area uphill of the surface-water intake. The region contributing ground water is the entire portion of the ground-water basin upgradient of the surface-water intake. Complete protection of the intake may encompass these two regions. However, sources of contamination entering the ground water at a significant distance from an intake, may undergo in-situ remediation of many constituents that is sufficient for the ground water to meet drinking-water standards at the intake.

- Although the geographic location of a surface-water divide may approximately coincide with that of a ground-water divide in an underlying water-table aquifer, colocation frequently does not occur. Absence of colocation results naturally, reflecting the hydraulic properties of the aquifer, distribution of recharge, etc. divides may also fail to coincide as the result of discharge from large-capacity wells, or the artificial recharge of large volumes of water to the aquifer. Additionally, seasonal changes in the position of ground-water divides is not unusual. States making the initial assumption that ground-water and surface-water divides approximately coincide, may want to consider further hydrogeologic

investigation to determine if this assumption is correct. This is particularly important where wells are located near enough to ground-water divides to cause displacement of the divide (the divide will be moved away from a pumping well.)

For further discussion of conjunctive delineation of source water protection areas, the reader is referred to the document *Delineation of Source Water Protection Areas, a Discussion for Managers; Part 1: A Conjunctive Approach for Ground Water and Surface Water* (expected August 1997).

2. Considerations for Conjunctive Delineation for Systems Primarily Supplied By Ground Water

- The water supplied by a PWS well often includes a surface water component.

- This fact is recognized in the term "ground water closely connected to surface water," which is used in some water protection programs. (The reader may note a similarity between this term and "ground water under the influence of surface water," which is a performance standard indicating that water withdrawn from a well contains a specific indicator or indicators, for example, giardia, of the presence of a surface water component.)

- During periods of high streamflow, surface water will migrate into ground water, the higher the stream stage, the further the potential migration of stream water. Streams that are "perched" (streams underlain by an unsaturated zone) may leak water and contaminants through the unsaturated zone to an underlying unconfined aquifer.

- The pumping of wells in the vicinity of surface water may induce infiltration of the surface water into the ground water and subsequently into the pumping well.

- A component of the water discharged by a well whose WHPA intersects a stream in good hydraulic connection with the aquifer, will usually have a shorter travel time than the time-of-travel designated in the state/local WHP program.

- A conjunctively delineated source water protection area for a PWS well could include, 1) the WHPA plus the entire watershed area upstream of the intersection of the WHPA and the stream, or 2) the WHPA plus the entire watershed area upstream of the intersection of the WHPA and the area where there is significant surface water discharge to ground water.

Appendix E

Partial List of Potential Sources of Contamination Found in Wellhead Protection Areas and in Watersheds

Introduction

Appendix E gives specific examples of potential sources of contamination. Under section 1453 states may, but are not required to, inventory all of these potential sources of contamination. Depending on the local situation, the following potential sources may or may not be *significant* potential sources. Appendix E should be used in conjunction with Appendix F. The stars (*) indicate sources of microbial contaminants.

Agriculture

Crop-related sources

Irrigated crop production
Non-irrigated crop production
Specialty crop production (e.g., horticulture, citrus, nuts, fruits)

*Grazing-related sources**

Pasture grazing - riparian and/or upland*
Pasture grazing - riparian*
Pasture grazing - upland*
Range grazing - riparian and/or upland*
Range grazing - riparian*
Range grazing - upland*

*Intensive animal feeding operations**

Concentrated animal feeding operations (CAFOs; permitted; PS)*

Confined animal feeding operations (NPS)*

Aquaculture*

Atmospheric deposition

Collection system failure

Combined sewer overflow*

Construction

Highway/road/bridge construction

Land development

Contaminated sediments

Debris and bottom deposits

Domestic wastewater lagoon*

Erosion from derelict land

Groundwater loadings

Groundwater withdrawal

Habitat modification (other than hydromodification)

Removal of riparian vegetation

Bank or shoreline modification/destabilization

Drainage/filling of wetlands

Highway maintenance and runoff

Hydromodification

Channelization

Dredging

Dam construction

Upstream impoundment

Flow regulations/modification

Industrial Point Sources

Major industrial point sources

Minor industrial point sources

Internal nutrient cycling (primarily lakes)

Land disposal

Sludge*

Wastewater*

Landfills*

Inappropriate waste disposal/wildcat dumping*

Industrial land treatment

Onsite wastewater systems (septic tanks)*

Hazardous waste

Septage disposal*

Leaking underground storage tanks

Marinas and recreational boating

In-water releases*

On-land releases*

Municipal point sources*

Major Municipal Point Sources - dry and/or wet weather discharges*

Major Municipal Point Sources - dry weather discharges*

Major Municipal Point Sources - wet weather discharges*

Minor Municipal Point Sources - dry and/or wet weather discharges*

Minor Municipal Point Sources - dry weather discharges*

Minor Municipal Point Sources - wet weather discharges*

Package plants (small flows)*****

Natural sources (e.g., arsenic, radon, wildlife)*

Other

Recreation and tourism activities (other than boating)

Golf courses

Resource extraction

Surface mining

Subsurface mining

Placer mining

Dredge mining

Petroleum activities

Mill tailings

Mine tailings

Acid mine drainage

Abandoned mining

Inactive mining

Salt storage sites

Sediment resuspension

Sewer lines (leaking)*

Silviculture

Harvesting, restoration, residue management

Forest management (e.g., pumped drainage, fertilization, pesticide application)
Logging road construction/maintenance
Silvicultural point sources

Sources outside state jurisdiction or borders*

Spills (accidental)*

Unknown source*

Urban runoff/storm sewers*

Nonindustrial permitted*
Industrial permitted*
Other urban runoff*
Illicit connections/illegal hookups/dry weather flows*
Highway/road/bridge runoff
Erosion and sedimentation

Waste storage/storage tank leaks (above ground)*

NOTE: EPA's 305(b) guidance also asks states to identify major sources of contamination of waters designated for drinking water supply use. States are urged to coordinate their source water and 305(b) information and programs.

Appendix F

Factors to Consider When Doing An Adequate Contamination Source Inventory and Adequate Susceptibility Analysis

Under section 1453, states, or their entities delegated to do assessments or portions of assessments, will be accomplishing contamination source inventories and susceptibility analyses for each delineated source water protection area. States will have to consider many factors when considering a class of land uses or a site. Below is a list of factors that states might consider. The factors utilized in each analysis should be selected on a site-specific basis and may include the following factors.

Factors For Ground Water and Surface Water Sources of Drinking Water

- Land-use zoning
- Existing best management practices or controls
- Surface water/ground water interaction
- Has any on-site landfilling, land treating, or surface impounding of waste, other than landscape waste or construction and demolition debris taken place, and will such circumstances continue?
- Are there any sand and gravel excavations which expose the water table and are used for illicit dumping?
- Are there major transportation corridors (roads, railroads, airports) where potential spills of hazardous substances or petroleum products might contaminate the drinking water source?
- Sludge disposal areas
- Are there utilities right-of-ways using pesticides?
- Are there permitted wastewater discharges (NPDES) which are of concern?
- Are there any industrial wastewater discharges into on-site drainage systems (e.g., septic systems, dry wells, etc.)?
- Are there agricultural, landscaping, or golf course activities which might lead to releases of nutrients (fertilizers,

manure) or pesticides to ground water or stormwater runoff?

- Are there concentrated releases of nitrogen to ground water from agricultural practices, landscaping practices, or dense developments relying on cesspools or septic systems?
- Are there portions of the source water protection area with high percentages of impervious sources which can themselves contribute heavy metals or organics, or which might lead to increased stormwater runoff and decreased ground water recharge?
- Location of stormwater discharges? Are there any discharges directly into a surface water supply or near a well?
- Are there road salt storage areas?
- Are there activities which involve the use, handling, or disposal of hazardous substances or petroleum products?
- Are there any on-site piles of special or hazardous waste present, will such circumstance continue, and is there piling of other wastes which could cause contamination of ground water?
- Are there any USTs present at the site, and will such circumstances continue?
- Is the use and management of above ground tanks consistent with best management practices?
- Has any on-site release of any hazardous substance or petroleum taken place which was of sufficient magnitude to contaminate ground waters (known Federal or state hazardous waste sites)?
- Has any situation(s) occurred at this site which resulted in a "release" of any hazardous substances or petroleum?
- Have any hazardous substances or petroleum, which were released, come into direct contact with the ground surface at this site? (Note—do not automatically exclude paved or otherwise covered areas that may still have allowed chemical substances to penetrate into the ground).
- Have any of the following actions/events been associated with the release(s) referred to above?
  - Hiring of a cleanup contractor to remove obviously contaminated materials including subsoils
  - Replacement or major repair of damaged facilities
  - Assignment of in-house maintenance staff to remove obviously contaminated materials including subsoils
  - Designation of the release as "significant"
  - Reordering or other replenishment of inventory due to the amount of substance lost
  - Temporary or more long-term monitoring of ground water at or neat the site
  - Stopped the use on an on-site or nearby water well because of offensive characteristics of the water

- Coping with fumes from subsurface storm drains or inside basements, etc.
- Signs of substances leaching out of the ground along the base of slopes at other low points on or adjacent to the site
- On-site release(s) that may have been of sufficient magnitude to contaminate ground waters.

- Water quality monitoring and use assessments (305(b) Report)
- Depth to the water table
- Confinedness of the aquifer
- Nature and thickness of the soil sequence
- Hydrogeologic parameter values
- Physical and chemical characteristics of potential contaminants
- Other hydrogeologic/soil/chemical/ physical factors that determine the likelihood of ground-water contamination and the fate and transport of contaminants to and through the aquifer
- Probable sources and causes of use impairments (305(b) Report)
- Well integrity
- Natural sources of contamination

Additional Factors For Surface Water Sources of Drinking Water

- Steep slopes
- Clay content of soils or soils that are highly erodible (critical areas)
- Recreational areas (campgrounds/trailer parks or greenway trails nearby a reservoir or tributaries)
- Tributaries or areas of a reservoir with high bacterial readings
- Land uses (that may not have zoning)
- Biological steam or lake assessments (305(b) Report)
- Modeling
- Upstream NPDES discharges
- Has any on-site landfilling, land treating, or surface impounding of waste, other than landscape waste or construction and demolition debris taken place, and will such circumstances continue?
- Is the use and management of containers and above ground tanks consistent with best management practices?
- Residential, commercial, or industrial construction activities.

Appendix G

TIMETABLE FOR CERTAIN ACTIONS UNDER THE 1996 SDWA AMENDMENTS

MANDATES FOR EPA FROM SDWA AMENDMENTS

EPA ACTION ITEM	DATE DUE	CITE
Disinfection and Disinfection Byproducts		
Promulgate Interim Enhanced Surface Water Treatment Rule	November, 1998	1412(b)
Promulgate Stage I Disinfectants and Disinfection Byproducts Rule	November, 1998	1412(b)
Promulgate Final Enhanced Surface Water Treatment Rule	November, 2000	1412(b)
Promulgate Stage II Disinfection Byproducts Rule	May, 2002	1412(b)
Ground Water Disinfection Rule: Issue regulations requiring disinfection for all public water supply systems, including surface water systems and "as necessary" ground water systems, and promulgate criteria for determining whether to require in ground water systems	"After August, 1999" By May, 2002	1412(b)(8)
Public Notification/Consumer Awareness		
Regulation for Public Notification	Unspecified	1414(c)(2)(A)
Regulation on Consumer Confidence Reporting	August, 1998	1414(c)(4)(A)

EPA ACTION ITEM	DATE DUE	CITE
Capacity Development and Operator Certification		
Publish guidance describing legal authorities and other means to ensure new CWSs and NTNCWSs demonstrate capacity (developed in consultation with the states)	August, 1998	1420(d)(4)
Publish information on recommended operator certification requirements, resulting from partnership with states, PWSs, and the public	February, 1998	1420(d)(2)(B)
Publish guidelines specifying minimum standards for certification and recertification of operators (in cooperation with states)	February, 1999	1419(a)
Source Water Protection		
Guidance to states for developing SWAPs	August, 1997	1453(a)
Guidance to states to assist in developing source water petition programs	August, 1997	1454(d)
Approval of state programs for source water assessments	February, 1999	1453(b)
Miscellaneous		
Guidance establishing procedures for state application for ground water protection grants	August, 1997	1429(b)
Publishing document related to modifying 12 standards	August, 1998	1445(a)(1)(D)
Alternative monitoring guidelines	August, 1997	1418(b)

Appendix H

Glossary Of Terms

Community Water System (CWS). A public water system that serves at least 15 service connections used by year-round residents of the area served by the system or regularly serves at least 25 year-round residents.

Class V Underground Injection Control (UIC) Rule. A rule under development covering wells not included in Class I, II, III or IV in which nonhazardous fluids are injected into or above underground sources of drinking water.

Non-Community Water System (NCWS). A public water system that is not a community water system. There are two types of NCWSs: transient and non-transient

Comprehensive State Ground Water Protection Program (CSGWPP). The program consists of a set of six strategic activities which foster more efficient and effective ground water protection through more cooperative, consistent, and coordinated operation of all relevant Federal, state and local programs within a state. The activities include establishing goals, setting priorities, defining authorities, implementing programs, coordinating information collection and management, and operating public education and participation activities.

Conservation Easements. Easements are an interest in land that entitles a person to use the land possessed by another (affirmative easement), or to restrict uses of the land subject to the easement (negative easement). A conservation easement restricts the owner to uses that are compatible with conservation environmental values. Easements are governed by state laws and thus there are variations among the states in how they are administered.

Contamination Source Inventory. The process of identifying and inventorying contaminant sources within delineated source water protection areas through recording existing data, describing sources within the source water protection area, targeting likely sources for further investigation, collecting and interpreting new information on existing or potential sources through surveys, and verifying

accuracy and reliability of the information gathered.

Drinking Water State Revolving Fund (DWSRF). Under section 1452 of the SDWA, EPA awards capitalization grants to states to develop drinking water revolving loan funds to help finance drinking water system infrastructure improvements, SWP, to enhance operations and management of drinking water systems, and other activities to encourage PWS compliance and protection of public health.

Farm Bill. The Farm Bill of 1996 is technically titled the *Federal Agricultural Improvement and Reform Act of 1996* (P.L. 104-127).

Ground Water Disinfection Rule (GWDR). Under section 107 of the SDWA Amendments of 1996, the statute reads, ". . . the Administrator shall also promulgate national primary drinking water regulations requiring disinfection as a treatment technique for all PWSs, including surface water systems, and, as necessary, ground water systems."

Maximum Contaminant Level (MCL). In the SDWA, an MCL is defined as "the maximum permissible level of a contaminant in water which is delivered to any user of a public water system."

Operator Certification. Certification of operators of community and nontransient, noncommunity water systems as required by a state implementing an EPA approved Water Operator Certification Program.

Primacy State. State that has the responsibility for ensuring a law is implemented, and has the authority to enforce the law and related regulations. State has adopted rules at least as stringent as federal regulations and has been granted primary enforcement responsibility.

Regional Stakeholder Meetings for Source Water Assessment and Protection. EPA's Regional office's meetings with stakeholders interested and involved in source water assessment and protection.

Significant Potential Source of Contamination. A facility or activity that stores, uses, or produces chemicals or elements, and that has the potential to release contaminants identified in a state program (contaminants with MCLs plus any others a state considers a health threat) within a source water protection area in an amount which could contribute significantly to the concentration of the contaminants in the source waters of the public water supply.

Sole Source Aquifer (SSA) Designation. The surface area above a sole source aquifer and its recharge area.

Source Water Protection Area (SWPA). The area delineated by the state for a PWS or including numerous PWSs, whether the source is ground water or surface water or both, as part of the state SWAP approved by EPA under section 1453 of the SDWA.

Subwatershed. A topographic boundary that is the perimeter of the catchment area of a tributary of a stream.

State Source Water Petition Program. A state program implemented in accordance with the statutory language at section 1454 of the SDWA to establish local voluntary incentive-based partnerships for SWP and remediation.

State Management Plan (SMP) Program. A state management plan under FIFRA required by EPA to allow states (e.g. states, tribes and U.S. territories) the flexibility to design and implement approaches to manage the use of certain pesticides to protect ground water.

Surface Water Treatment Rule (SWTR). The rule specified maximum contaminant level goals for *Giardia lamblia*, viruses and *Legionella*, and promulgated filtration and disinfection requirements for PWSs using surface water sources or by ground water sources under the direct influence of surface water. The regulations also specified water quality, treatment, and watershed protection criteria under which filtration may be avoided.

Susceptibility Analysis. An analysis to determine, with a clear understanding of where the significant potential sources of contamination are located, the susceptibility of the PWS(s) in the source water protection area to contamination from these sources. This analysis will assist the state in determining which potential sources of contamination are "significant."

To the Extent Practical. States must inventory sources of contamination to the extent they have the technology and resources to complete an inventory for a Source Water Protection Area delineated as described in the guidance. All information sources may be used, particularly previous Federal and state inventories of sources.

Transient/Non-Transient Non-Community Water Systems (T/NTNCWS). Water systems that are non-community systems: transient systems serve 25 non-resident persons per day for 6 months or less per year; non-transient systems regularly serve at least 25 of the same non-resident persons per day for more than 6 months per year. Transient non-community systems typically are restaurants, hotels, large stores, etc. Non-transient non-community systems typically are schools, offices, churches, factories, etc.

Underground Injection Control (UIC) Program. The program is designed to prevent underground injection which endangers drinking water sources. The program applies to injection well owners and operators on Federal facilities, Native American lands, and on all U.S. land and territories.

Watershed. A topographic boundary area that is the perimeter of the catchment area of a stream.

Watershed Approach. A watershed approach is a coordinating framework for environmental management that focuses public and private sector efforts to address the highest priority problems within hydrologically-defined geographic areas, taking into consideration both ground and surface water flow.

Watershed Area. A topographic area that is within a line drawn connecting the highest points uphill of a drinking water intake, from which overland flow drains to the intake.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field, supplying a PWS, through which contaminants are reasonably likely to move toward and reach such water well or well field.

Appendix I

Brief Summary of Requirements for Sections 1453 and 1428(b) State Submittals of the Act for State Source Water Assessment Programs

Requirements and EPA Guidance for the State Submittal Under Section 1453 of SDWA

The elements that a submittal will need to contain in order to be approved by EPA are described in Chapter 2, Part II. Many of these are explicit in sections 1453 and 1428 and must be included; many other elements EPA believes to be crucial for an effective SWAP. For these latter elements only, where a state can show it has an equivalent alternative to what EPA expects of a submittal, EPA will approve the alternative element(s), provided that the state demonstrates that the alternative meets the same functional objectives. (For more detailed language on each requirement, refer to Chapter 2.)

In order to be approved, a state submittal needs to contain the following four sections:

- Description of how the state achieved public participation in developing its submittal
- Description of the approach the state will take to implement a SWAP and the requirements/options for assessments
- Description of how the state will make the results of the assessments available to the public
- Description of how the state will implement its chosen SWAP

Each state *is statutorily required* to:	**Each state *needs* to:**
Public Participation	
• Convene a technical advisory committee and a citizens advisory committee (or one committee)	• Ensure broad representation on its advisory group(s) • Provide adequate opportunity to various groups to participate on the advisory committee(s) • Describe the committee's advice regarding program development questions
• Conduct public hearings workshops, or focus groups, etc.	• Provide opportunities for general public involvement, by various means • Provide a summary of how the state responded to all substantive public comments

Each state ***is statutorily required*** to:	Each state ***needs*** to:
SWAP Approach	
• Conduct SWAPs for the "protection and benefit of PWSs" • Submit SWAPs to the appropriate Regional Administrator by February 1999 (within 18 months after EPA publishes final guidance)	• Describe the approach the state will take to implement a SWAP • Describe whether the state plans to implement a source water protection program • Describe how a SWAP will link with existing protection program
• Delineate boundaries of the assessment areas using all reasonably available hydrogeologic and other information	• For ground water systems, use delineation methods in accordance with EPA accepted guidelines for WHP • Include recharge areas that are not adjacent to or surrounding the well • For surface water, delineate the entire watershed area upstream of any intakes or diversion structures, up to the state's borders
• Conduct a contamination source inventory • Conduct an inventory for raw water contaminants regulated under SDWA, and *Cryptosporidium*	• Indicate what "contaminants of concern" its SWAP will address • Include a clear description of the sources of contamination (or categories of sources) • Choose an approach for determining which types of potential sources are significant • Indicate what types of potential sources of the contaminants of concern will be considered "significant"
• Conduct a susceptibility determination	• Define "susceptibility determination" • Describe how the results of susceptibility determination will contribute to the protection and benefit of the PWSs
• Conduct SWAPs for the "protection and benefit of PWSs"	• Describe how it will delineate source water protection areas, conduct an inventory of contamination sources, and conduct a susceptibility determination for that part of a boundary river, the Great Lakes, or multi-state rivers that are within the state's borders • Exert the maximum practical effort to ensure interstate coordination for assessments

Each state ***is statutorily required*** to:	Each state ***needs*** to:
Making the Results of Assessments Available to the Public	
• Ensure the results of the assessments are made available to the public in an understandable manner	• Make the results of the assessments available in an expeditious manner • Make available all the information collected during each assessment, when requested • Create maps which include the delineated area and sources of contamination described in the inventory
Implementing the Chosen SWAP	
• Implement the SWAP immediately upon approval	• Describe how, to whom, and what aspects of SWAP implementation the state will delegate • Indicate the state's definition of delegation • State the financial capacities of the entity or entities to whom aspects of the assessments are delegated • Explain how it will complete the assessments, using the resources allocated by the state • Explain how it will coordinate with other state environmental programs, Tribes, local stakeholders, other states, and federal agencies • Describe how it will periodically report to EPA on the progress of the SWAPs
• Complete the assessments in the approved timetable	• Describe the timetable for implementing and completing the assessments within the state • Indicate whether the state wants an extension (of up to 18 months)

Appendix J

List of Acronyms

305(b)	The National Water Quality Inventory Report to Congress mandated by section 305(b) of the CWA
AMWA	American Metropolitan Water Association
ASDWA	Association of State Drinking Water Administrators
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMR	Chemical Monitoring Reform
CPA	Conservation Priority Area
CREP	Conservation Reserve Enrollment Program
CRP	Conservation Reserve Program
CSGWPP	Comprehensive State Ground Water Protection Program
CWS	Community Water System
CWA	Clean Water Act
CWSRF	Clean Water Act State Revolving Fund
CZARA	Coastal Zone Act Reauthorization Amendments
DBP	Disinfection By-Products
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOT	Department of Transportation
DWSRF	Drinking Water State Revolving Fund
ECOS	Environmental Council of the States
EPCRA	Emergency Planning and Community Right-To-Know Act
EIS	Environmental Impact Statement
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FSA	Farm Service Agency
GIS	Geographic Information System
GWDR	Ground Water Disinfection Rule
GWPC	Ground Water Protection Council
IUP	Intended Use Plan
IWI	Index of Watershed Indicators
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NASDA	National Association of State Departments of Agriculture
NCWS	Non-Community Water System
NGA	National Governors' Association
NEP	National Estuary Program

NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resource Conservation Service
OGWDW	Office of Ground Water and Drinking Water
OSM	Office of Surface Mining
ORSANCO	Ohio River Valley Water and Sanitation Commission
PWS	Public Water System
PWSS	Public Water Supply Supervision Program
RASA	Regional Aquifer System Analysis
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan
RSVP	Retired and Senior Volunteer Program
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SMP	State Management Plan
SSA	Sole Source Aquifer
STORET	STOrage and RETrieval U.S. Waterways data system
SWAP	Source Water Assessment Program
SWCP	State Wetlands Conservation Plan
SWP	Source Water Protection
SWTR	Surface Water Treatment Rule
TMDL	Total Maximum Daily Load
TOT	Time-of-Travel
TRI	Toxic Release Inventory
UIC	Underground Injection Control
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UST	Underground Storage Tank
WHP	Wellhead Protection Program
WHPA	Wellhead Protection Area