EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

January 7, 1987

OFFICE OF
WATER

Dear Participants:

Welcome, and thank you for participating in this workshop to develop guidance for implementing the Safe Drinking Water Act Amendments of 1986. Enactment of these amendments instituted two new programs to protect the ground-water resource: the Wellhead Protection Program (WHP) and the Sole Source Aquifer Demonstration Program (SSA). The Office of Ground-Water Protection at EPA Headquarters, together with EPA regional offices, is responsible for implementing and administering the programs.

Among its implementation responsibilities, EPA must, by June 1987, develop and issue to the States technical guidance which they may use in determining the boundaries of a wellhead protection area and guidance and rule requirements for the receipt of Federal grant support under both the WHP and SSA programs.

This workshop is intended to obtain a wide range of opinion which will assist EPA in developing this guidance. You and the other participants of this workshop were selected to represent the groups involved in, or otherwise affected by, ground-water protection efforts. Among those represented are state and local governments, environmental groups, business and industry, other federal agencies, and academic experts.

The goal of this workshop is to provide a forum for these individuals and organizations to express their opinions and viewpoints. I can assure you that the input you provide to EPA as a participant of this workshop is vital to the implementation of these programs. EPA will use and build upon your ideas and comments as it develops guidance.

Again, welcome, Best wishes for a productive and interesting workshop.

Very truly yours,

Larry Jensen

Larry Jensen
Assistant Administrator
for Water

U.S. EPA Headquarters Library
Mail code 3201
1200 Pennsylvania Avenue NW
Washington DC 20460

HEADQUARTERS LIBRARY
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 20 1991

WORKSHOP ON WELLHEAD PROTECTION PROGRAM MANAGEMENT PROTECTION PLANS

OFFICE OF GROUND-WATER PROTECTION
U.S. ENVIRONMENTAL PROTECTION AGENCY

January 28-29, 1987

CONTENTS

Agenda

List of participants

I. Introduction to the Workshop

II. Background Information on Wellhead Protection Program and Sole Source Aquifer Demonstration Program

III. Definition of an "Adequate" State Wellhead Protection Program

IV. Identification of Contaminants and Sources

V. Management and Controls -- When and How to Respond to Potential Threats

VI. Institutional Considerations

Appendix I -- Ground-Water Sections of Safe Drinking Water Act Amendments of 1986

Appendix II -- Ground-Water Sections of Congressional Conference Report

TENATIVE LIST OF PARTICIPANTS
MANAGEMENT PROTECTION PLANS WORKSHOP

Mr. Tom Allen
Ohio EPA
361 E. Broad Street
Columbus, OH 43216

Mr. Timothy Amsden
Water Management Division
Director, Office of Ground Water
EPA Region VII
Kansas City, KS 66101

Mr. Edward Anton
California State Water Resources
Control Board
901 "P" Street
Sacramento, CA 95814

Mr. Thomas E. Arizumi
Supervisor of the Drinking Water Section
Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Mr. Sharad Bhatia, Director
Division of Environment
Kansas Department of Health and Environment
Forbes Field, Building 740
Topeka, KS 66620

Mr. Jerry Biberstine
Drinking Water/Ground Water Section
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

Professor Edith Brown-Weiss
Georgetown University Law Center
600 New Jersey Avenue, NW
Washington, DC 20001

Ms. Allegra Cangelosi
Coalition of Northeastern
Governors
Policy Research Center
Hall of the States
400 North Capitol Street, NW
Washington, DC 20001

Mr. Armando Carbonell
Cape Cod Planning
and Economic Development Commission
First District Court House
Barnstable, MA 02630

Mr. Richard Carlson
Director, Illinois EPA
2200 Churchill Road
Springfield, IL 62706

Mr. Mike Carnevale
Water Quality Division
Wyoming Department of
Environmental Quality
Cheyenne, WY 82002

Dr. Russell F. Christman, Chairman
Department of Environmental
Sciences and Engineering
Room 106B
Rosenau Hall 201H
School of Public Health
University of North Carolina
Chapel Hill, NC 27514

Mr. Phil DeGaetano, Director
New York Bureau of Water
Quality Management
50 Wolf Road, Room 306
Albany, NY 12233-3500

Dr. Rodney S. DeHan
Assistant Bureau Chief
Florida Department of
Environmental Regulations
2600 Blairstone Road
Tallahassee, FL 32301

Mr. Tom Devine
Office of Solid Waste and
Emergency Response
WH-562A
US EPA
401 M Street, S.W.
Washington, D.C. 20460

Mr. Mike Donohue
New Hampshire Department
of Environmental Services
Water Supply and Pollution Control
Division
P. O. Box 95
Hazen Drive
Concord, NH 03301

Mr. Brendan Doyle
Office of Policy, Planning and Evaluation
PM-221
US EPA
401 M Street SW
Washington, DC 20460

Mr. Paul Dutram
Ground-Water Coordinator
State Planning Office
State House Station 38
Augusta, ME 04333

Mr. Allen Egler
(Chemical Manufacturers Association)
Dupont Corporation
13W06 Louviers Building
Wilmington, DE 19898

Mr. Dennis Erinakes
National Ground-Water Specialist
South National Technical Center
USDA, Soil Conservation Service
Box 6567
Fort Worth, TX 76115

Mr. David A. Fierra
Director, Water Management Division
John F. Kennedy Building, Room 2203
EPA Region I
Boston, MA 02203

Mr. Clint Hall
Office of Research and Development
Robert S. Kerr Environmental Research Laboratory
PO Box 1198
Ada, OK 74820

Mr. Mario Hegewald
Special Assistant to the
Assistant Administrator
Office of Water
WH-556
US EPA
401 M Street SW
Washington, DC 20460

Mr. Steve Hirsch
Office of General Counsel
LE-132S
US EPA
401 M Street SW
Washington, DC 20460

Mr. Chuck Hunnewell
Division of Water Resources
New Jersey Department of
  Environmental Protection
1474 Prospect Street
Trenton, NJ 08638

Mr. Gale Hutton
Chief, Water Quality Division
Nebraska Department of Environmental Control
301 Centennial Mall South
Lincoln, NE 68509

Mr. Martin Jaffe, Associate Professor
School of Urban Planning and Policy (M/C 348)
University of Illinois
PO Box 4348
Chicago, IL 60680

Ms. Patricia Janssen
Department of Defense
Environmental Policy
OASD (I/EP)
Room 3D 833
Pentagon
Washington, DC 20301-4000

Mr. Karl Johnson
Fertilizer Institute
1015 18th Street, NW
Washington, DC 20036

Mr. Bill Kelly
Division of Water
Michigan Department of Public Health
3500 N.Logan Street
P. O. Box 30035
Lansing, MI 48909

Mr. Kenton Kirkpatrick
Deputy Director
Water Management Division
EPA Region VI
1401 Elm Street
Dallas, TX 75270

Mr. Bill Klemt
(National Drinking Water Advisory Council)
Texas Water Commission
P.O. Box 13087
Austin, TX 73711

Mr. Jerry Kotas
Office of Drinking Water
WH 550
US EPA
401 M Street SW
Washington, DC 20460

Mr. Robert Krill
(Association of State Drinking
Water Administrators)
Director, Bureau of Water Supply
Wisconsin Department of Natural Resources
Box 7921
Madison, WI 53707

Mr. Bill Kucharski
(Edison Electric Institute)
Pacific Power and Light
920 Southwest 6th Avenue
Portland, OR 97204

Mr. Don Kuntz
West Virginia Health Department
1800 Washington Street, East
Charleston, WV 25305

Mr. James Kutzman
Chief, Office of Ground Water
Water Management Division
EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Ms. Elizabeth Lapointe
Office of Solid Waste and Emergency Response
WH-562A
US EPA
401 M Street SW
Washington, DC 20460

Mr. Richard Long
Director, Office of Ground Water
Water Management Division
EPA Region VIII
One Denver Place
999 18th Street, Suite 1300
Denver, CO 80202-2413

Ms. Nancy Lopez
US Department of the Interior
18th and C Streets, NW
Washington, DC 20240

Mr. David Terry
Division of Water Supply
Massachusetts Department of Environmental
  Quality Engineering
1 Winter Street
Boston, MA 02108

Dr. Raymond Thron
Director, Division of Environmental Health
Minnesota Department of Health
717 Delaware Street, S.E.
P.O. Box 9441
Minneapolis, MN 55440

Mr. David Wagner
Deputy Commissioner
Indiana Department of Environmental Management
105 Meridian Street
Indianapolis, IN 46225

Mr. Clive Walker
Water Policy and Legislative Coordinator
Soil Conservation Service
Department of Agriculture
Room 5237S
P.O. Box 2890
Washington, DC 20250

Ms. Robin Whyatt
Natural Resources Defense Council
122 East 42nd Street
New York, NY 10021

Mr. R. Paul Wilms
Director, Division of Environmental
    Management
North Carolina Department of Natural
  Resources and Community Development
P.O. Box 27687
Raleigh, NC 27611

Mr. Doug Yoder
Assistant Director
Dade County Environmental
  Resources Management
111 NW 1st Street
Miami, FL 33128

This document was compiled by:

U.S. Environmental Protection Agency
Office of Ground-Water Protection
Marian Mlay, Director

with assistance from:

Temple, Barker & Sloane, Inc.

and

Booz-Allen and Hamilton, Inc.
under contract no. 68-03-3304

CHAPTER I

I. INTRODUCTION TO THE WORKSHOP

Ground-water protection has received increasing emphasis over the past decade as an important environmental responsibility for the states and the federal government. Some states and regions have been active in ground-water protection for years. In all areas of the country, however, the decade has brought a heightened awareness of the vulnerability of ground-water to threats from a myriad of sources.

In 1984, the U.S. Environmental Protection Agency (EPA) took two significant steps to improve and coordinate programs at the federal level that affect ground water and to assist the states in their efforts. First, EPA established the Office of Ground-Water Protection (OGWP) as the focus of ground-water policy coordination and planning for the Agency. OGWP is responsible for working with the states to develop and implement ground-water protection strategies, for coordinating EPA ground-water policies and guidelines, enhancing ground-water data management systems and capabilities, and initiating and conducting special studies of ground-water contamination, among other tasks.

Also in 1984, after several years of development, EPA adopted a formal "Ground-Water Protection Strategy" which set forth goals and objectives for the Agency and described the Agency's management approach to this field. The strategy recognized the need to enhance protection of ground-water quality through improved programs at the Federal and State levels, and acknowledges the States' principal role in resource protection in contrast to EPA's statutory authorities related to specific sources of contamination and contaminants. It called for: (a) an EPA policy of differential protection based on use, value and vulnerability of the resource; (b) greater policy consistency and coordination among ground-water related programs; (c) greater attention to sources of contamination of national concern; and (d) support to states in ground-water strategy development and implementation.

Nearly every State has underway or is completing a state ground-water protection strategy, in part with the support of EPA grants (CWA/106). About half of the States have or are establishing their own ground-water classification systems or other approaches to providing protection.

Last summer, the President signed the Safe Drinking Water Act Amendments of 1986 (SDWAA) into law. The Amendments include two new ground-water provisions: the Wellhead Protection (WHP) Program and the Sole Source Aquifer (SSA) Demonstration Program. Both are designed to support development of state and local efforts to protect ground-water resources. Included, as

Appendix I, is a copy of the statutory language creating these new programs. In addition, that portion of the Congressional conference report which describes the programs is included as Appendix II.

A new Section 1427 of the Act establishes a demonstration program to protect critical aquifer protection areas (CAPA) within designated sole source aquifers. The goal of the demonstration programs, which can be developed by any state or local political subdivision that identifies a CAPA within its jurisdiction, is to demonstrate innovative technologies and control mechanisms that can be used to ensure the maintenance of ground-water quality for the protection of human health, environment, and ground water.

The second new program, Section 1428 of the Act, is designed to protect the wellhead areas of all public water systems from contaminants that may have adverse human health effects. Wellhead protection areas are defined as any surface or subsurface areas adjacent to public water supply wellheads through which containments may move and reach the wellfield.

These two programs represent major new responsibilities for OGWP. In its continuing efforts to assist States in developing a comprehensive strategic approach to ground-water protection, EPA will, to the extent possible, support state efforts to incorporate these new ground-water programs into their approaches.

Both programs are similar in some respects--they are voluntary programs for which some federal support may be available, and both are designed to help keep ground water free from contamination and to protect human health. However, differences exist in both the goals and expected implementation of each program. Each program is discussed in more detail in Chapter 2.

The Workshop

Since passage of the Amendments last June, OGWP has been actively working with a number of experts both within and outside of EPA to help implement the new law. In soliciting this assistance, EPA recognizes and endorses the primary role of the states in ground-water protection. Four technical committees have been established to assist OGWP in this effort: a SSA designation committee; a hydrological criteria committee; a management protection plan committee; and a grant guidelines committee.

As noted above, ground-water protection is primarily a state prerogative. Accordingly, EPA intends to ensure that the guidances developed will provide states and localities maximum flexibility in developing the programs while ensuring that the goals and objectives of the law are met.

As part of its information gathering process, OGWP is conducting two workshops during January 1987. The goal of the workshops is to assist OGWP in developing guidances, which EPA intends to publish for the WHP program by June 1987. The guidances will be used by states and municipalities to develop their programs and to apply for federal grants.

The primary focus of the workshops is directed at the WHP program, rather than the SSA program. Clearly the two are related and much of the information gathered at the workshops will be applicable to the development of guidelines and material for each. Still, EPA is interested in focusing the attention of these workshops on the wellhead protection program.

The first workshop will focus on the guidance that should be provided to the states in their efforts to delineate wellhead protection areas around various wellfields. As described in Subsection 1428(e) of the statute, EPA may consider several factors such as the radius of influence around a wellfield, the depth of drawdown of the water table by the wellfield at any given point, the time and rate of travel as well as the distance from the wellfield of potential contaminants, or other factors affecting the likelihood of contaminants reaching the well and wellfield.

The second workshop will focus on those elements of the state program that are enumerated in the statute to ensure the contamination of public water supply wells is avoided. The workshop is designed to help EPA decide, as required by the statute, how to judge whether a state program adequately meets the goals of the law. The workshop will deal with four areas: the definition of an "adequate state program" as defined in the statute; identification and assessment of potential contaminants and their sources; the management and control of such contaminants; and the need to coordinate the roles of state and local agencies in the design and implementation of the program.

Overview

In developing an "adequate" state program that will be eligible for receipt of federal funds, states will have to go through a number of steps as shown diagramatically in Figure I-1. Key elements of these stages will be discussed and evaluated in the two workshops.

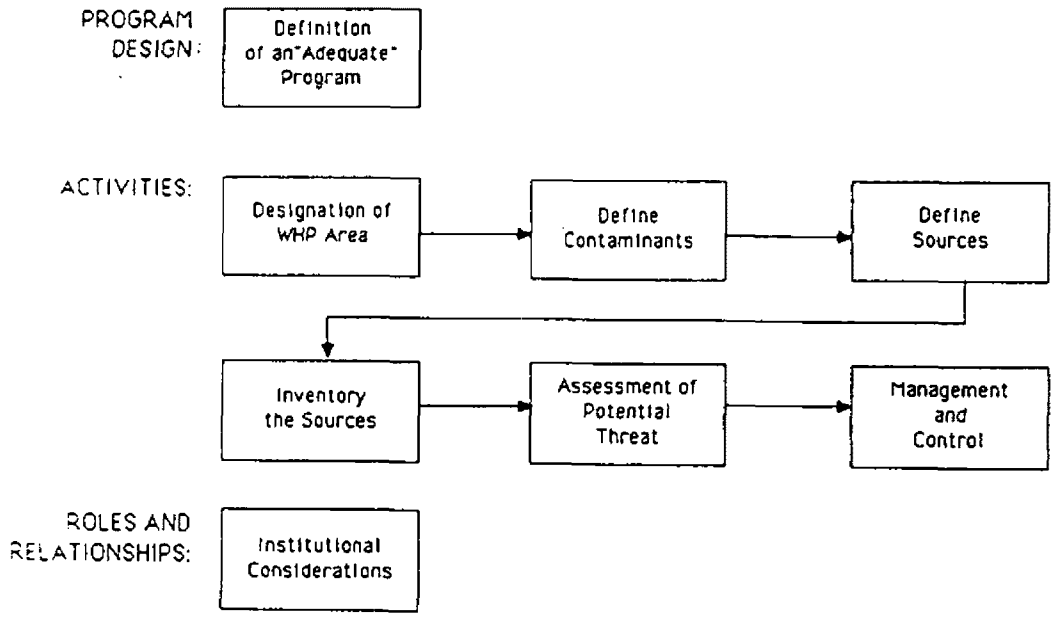
Both workshops will consider the overall question of what makes an adequate program and the relative roles and responsibilities of state and local governments in developing and implementing a plan.

The first workshop will also deal with the technical questions concerning the designation of the wellhead protection area (WHPA) around public water supply wells. The second workshop will address more programmatic concerns including the

definition of contaminants and their sources, an inventory of the sources, an assessment of the potential threat posed by the sources, and any necessary controls or other management approaches that have to be imposed to ensure protection of the WHPA.

FIGURE I - 1

Major Stages in Developing and Implementing a State WHP Program



Workbook Outline

Chapter 2 provides background information on the two programs and a review of current state activities in wellhead protection. The remaining chapters address the major issues for discussion. Each issue is summarized and several options are presented along with some advantages and disadvantages of each.

Workshop Structure

The workshop will contain four key elements, as follows:

1. Full-Group Discussion--Review of the Working Papers

Full-group, or plenary, discussions will take place in the main meeting room at several points during the workshop. The purpose of these discussions will be to identify and discuss the principal issues presented in this workbook as well as other issues raised by the workshop participants in preparation for more detailed discussions that occur among individual teams.

2. Team Discussions

At several points during the workshop, the participants will break into smaller teams. Each team will be expected to independently evaluate options and develop a preliminary position on the topic assigned. In so doing participants will be asked to discuss and review a number of options that EPA could use in developing its guidance. Moreover, participants will be encouraged to develop new options on their own.

3. Brief Team Progress Reports

At the conclusion of each of these team working sessions, each team will present to the full working group approximately a five-minute report of its discussion and conclusions. The purpose of these reports will be to provide an indication to the full group of each team's direction and, to the extent achieved, any recommendations to the EPA.

4. Final Discussion

After the team presentations, the participants will discuss the issues raised and the team recommendations made. The workshop will not attempt to reach a consensus on individual issues. Its focus will be on obtaining a full discussion of issues and options for EPA's subsequent use in developing the guidance.

CHAPTER II

I. BACKGROUND INFORMATION ON THE WELLHEAD PROTECTION PROGRAM AND THE SOLE SOURCE AQUIFER DEMONSTRATION PROGRAM

On June 19, 1986, President Reagan signed into law the Safe Drinking Water Act Amendments (SDWAA) of 1986. Included in this legislation were two programs that call for a new role for the federal government in ground-water protection.

While ground-water protection is traditionally the responsibility of state and local governments, in recent years the Congress has shown increased interest in helping to address the problem from the national level. Both new programs are designed to strengthen state and local efforts to address present ground-water problems and to help eliminate future ones.

During consideration of these, and other, amendments to the Safe Drinking Water Act, the Administration expressed concerns about the potential Federal intrusion into highly localized decisions such as those involving land use policy. The final committee conference report (See Appendix II) addressed some of these concerns and spelled out the Congress' view on the range and scope of the new programs. The report states, inter alia, that:

- A state's existing authority to manage, regulate, protect or identify ground-water resources not be limited, e.g., a State may identify significant recharge areas not contiguous to a well(s) in defining WHPAs.

- The program be structured to afford States maximum flexibility in formulating a protection strategy, e.g., not required to adopt a regulatory program.

- States can be expected to take a wide variety of approaches to wellhead protection and each could develop a different approach for the whole state and within different protection areas.

- EPA should use its disapproval power judiciously. The only penalty for State failure to submit a plan is not receiving grants.

As part of its efforts to implement the new law, EPA intends to produce four documents by June, 1987.

- A technical guidance, as required by the statute, for states to use in determining the extent of an appropriate wellhead protection area

- A grants guidance for states to use in developing state wellhead protection programs and in applying for grants under the Act

- A rule required by statute that will establish criteria for identifying critical aquifer protection areas (CAPA's) eligible for funding consideration under the sole source aquifer demonstration program, and

- A guidance that states and localities can use to develop sole source aquifer demonstration programs and to apply for a grant under provisions of the law

STATE PROGRAMS TO ESTABLISH WELLHEAD PROTECTION AREAS (WHPAs)

Under Section 1428 of the new Amendments, States shall develop programs to protect the wellhead areas of all public water systems within their jurisdiction from contaminants that may have any adverse effects on the health of humans.

WHP Grant Guidance

In order to obtain a WHP grant, a state must submit a program to EPA that is "adequate" to protect the WHP's from contamination. The Act specifies that the following elements be incorporated into state programs.

- Duties of State and local agencies and public water supply systems in implementing the program

- Delineation of wellhead protection areas for each public well

- Identification of all potential anthropogenic sources within the protection area

- A program that contains, as appropriate: technical assistance; financial assistance; implementation of control measures; education; training; and demonstration projects to protect the wellhead areas from contaminants

- Contingency plans for alternative water supplies in case of contamination

- Siting considerations for all new wells

- Procedures for public participation

This program must be submitted to the Administrator of EPA within three years after enactment. The State is expected to implement this program within two years after it has been approved by the Administrator. The only impact on a State for failing to participate in the Wellhead Protection Program, however, is the loss of related funds.

The statute is structured to allow States maximum flexibility in formulating their programs. The Administrator will disapprove a program only if it is not adequate to protect public water wells from contamination. Any disapproval must be made within nine months of submittal and should a program be disapproved the State must modify the program and resubmit its plan within six months.

The Administrator shall make 50-90 percent matching grants to the State for costs for the development and implementation of the state program. The Congress has authorized $20 million for each of FY 1987 and 1988 and $35 million for each FY 1989 through 1991 for these purposes.

Each State which receives funds under this section must submit a biennial State report describing its progress in implementing the program and any amendments to the program resulting from new wells. The Act further specifies that all Federal programs are subject to and will comply with the provisions of a state program. However, the President may exempt any potential sources of pollution from the law if he determines that the exemption serves the paramont interest of the United States.

WHP Technical Guidance

One of the requirements of an adequate state program is that it contains a determination of wellhead protection areas for each public water supply. The term "wellhead protection area" is defined in the SDWA as "the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield." The precise delineation of the area is not specified in the law, but is left to be determined by the individual State.

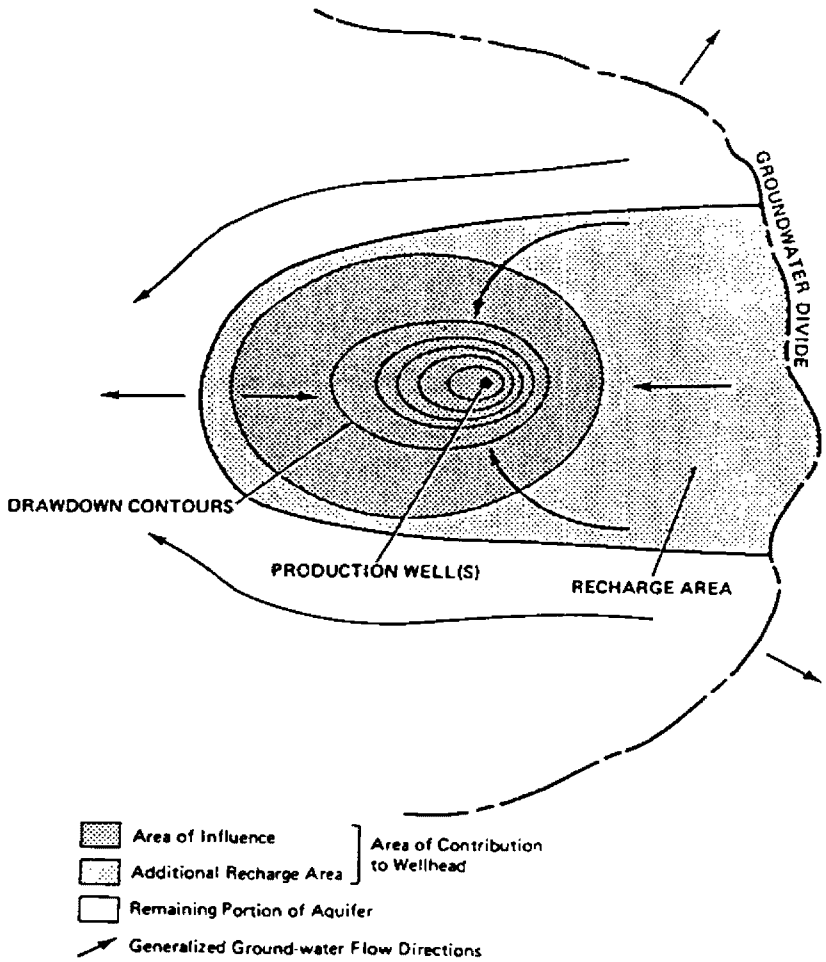
EPA is required to issue technical guidance by June 1987 which States may use in determining the extent of the WHP area. According to the statute, the guidance may consider factors such as radius of influence around a well or wellfield, the depth of drawdown of the water table by such well or wellfield at any given point, the time and rate of travel of various contaminants in various hydrologic conditions, and distance from the well or wellfield.

The terminology used to describe wellhead protection areas is exhibited in Figure II-1 on the following page. In general, a wellhead protection area represents a portion of an aquifer which includes all or part of the area of influence around a pumping well and sometimes portions of upgradient recharge areas or portions of the surrounding aquifer as well. The "area of influence" is the area surrounding a pumping or recharging well

within which the potentiometric surface has been changed. The "recharge area" is that permeable layer through which precipitation and surface water may percolate to the aquifer and eventually reach the well. It is important to remember that the Amendments allow considerable flexibility to the States in defining which portion of this theoretical model would apply in specific cases.

Some governments have defined wellhead protection areas to be only hundreds or a few thousand feet from the well. Other governments have defined them to be a mile or several miles from the well. Wellhead protection areas are fairly common in Western European countries such as Germany, Switzerland, and the Netherlands and are being used in parts of the United States such as Dade County, Florida and Cape Cod, Massachusetts.

FIGURE II - 1



TERMINOLOGY FOR WELLHEAD PROTECTION AREA DELINEATION

SOLE SOURCE AQUIFER (SSA) DEMONSTRATION PROGRAM

This new Section, 1427 of the Act, builds upon the existing Sole Source Aquifer program, Sec. 1427(e) of the SDWA. It is a demonstration program establishing critical aquifer protection areas (CAPA) within designated sole source aquifers to ensure the maintenance of ground-water quality for the protection of human health, environment and ground-water. The purpose of any demonstration is to assess the impact of programs on ground-water quality and to identify protection measures that are found to be effective in protecting ground-water resources. EPA must develop by June 1987 a rule including hydrogeological, social, and economic criteria that will be used to identify critical aquifer protection areas. Finally, using information obtained by the states on their programs, EPA must provide to Congress by September 30, 1990, a report assessing the accomplishments of the demonstration program.

Any State or local government, municipality or other political subdivision which identifies a CAPA over which it has jurisdiction may apply to the EPA Administrator to have that area selected for the demonstration program. The Governor must be a co-applicant. An area can be defined as a CAPA if it is a designated sole source aquifer or is part of a sole source aquifer for which an application and designation has been received and approved within twenty-four months of enactment and meets CAPA criteria. Designated SSAs with an approved area-wide ground-water quality plan under section 208 of the Clean Water Act as of the date of enactment are defined as CAPAs under the statute.

An applicant for a demonstration program approval must prepare or complete several activities including the development of a comprehensive management plan for the proposed critical aquifer protection area (CAPA). This plan must contain the following:

- A map detailing the boundary of the critical aquifer protection area
- Existing and potential point and non-point sources of ground-water contamination
- An assessment of the relationship between activities on the land surface and ground-water quality
- Proposed actions and management practices to prevent adverse ground-water quality impacts
- Identification of the authority adequate to implement the plan, estimates of costs, and sources of matching funds

An applicant can include optional components in the management plan including an assessment of the quality of existing ground-water recharged through the area and a comprehensive statement of land use management. If an applicant has an approved ground-water quality management plan at the time of enactment under Section 208 of the CWA this can be submitted in place of the comprehensive management plans. During the development of the plan the applicant is required to hold public hearings and consult with all affected governmental entities.

The Administrator must approve any application received within 120 days based on a determination that the application meets the definition of a critical aquifer protection area and meets the objectives of the sections. Should the application be rejected it may be modified and resubmitted.

If the demonstration program application is approved the Administrator may enter into a cooperative agreement with the applicant to establish a demonstration program. The applicant may receive 50 percent matching grants for both the development and implementation of the program. However, the total amount of the grant cannot exceed $4 million per year per aquifer. The program has been authorized $10 million for FY 1987, $15 million for FY 1988, and $17.5 million for each of the three fiscal years 1989 through 1991.

The State must prepare a report assessing the impact the program on ground-water quality and identify those measures found to be effective in protecting ground water. A report is due from the State to EPA by December 31, 1989. EPA must submit a combined report to the Congress by September 30, 1990.

CURRENT STATE ACTIVITIES IN WELLHEAD PROTECTION

Within the past five years most states have initiated ground water protection programs. The structure and scope of these programs is variable and reflects differing demographic, political and hydrogeological conditions.

A handful of states and municipalities have developed wellhead protection programs as part of an overall ground-water protection program. The main focus of these programs is the delineation of wellhead or recharge protection areas within which land use controls are often imposed to protect water supply wells.

Numerous methods have been developed to delineate these protection areas. Six of the most common techniques used in the U.S. and in Western Europe in these delineations are listed in Figure II-2.

FIGURE II-2 WHPA DELINEATION METHODOLOGY CRITERIA, AND USE RELATIONSHIPS

METHOD	CRITERIA RELIED ON	SELECTED LOCATIONS WHERE USED*
1. Arbitrary Fixed Radius - A circle of standardized dimensions having little to no hydrogeologic basis.	Distance	Nebraska Florida Edgartown, MA Duxbury, MA
2. Calculated Fixed Radius - A circle of standardized dimensions determined mathematically with hydrogeologic basis.	Distance Time of Travel	Florida
3. Simplified Variable Shapes - Standardized recharge areas derived from analytical calculations.	Time of Travel Drawdown	England
4. Analytical Flow Model - A mathematical determination of the area in which ground-water contributes to a pumping well.	Drawdown Physical Features	Cape Cod, MA Duxbury, MA Edgartown, MA West Germany Holland
5. Geologic/Geomorphic - An area defined by flow boundaries detected through geologic field study and observation.	Physical Features	Vermont Midstate Reg. Planning Agen., CT Duxbury, MA
6. Numerical Flow/Transport Model A computerized approximation to the solution of differential equations (e.g., ground-water flow and/or solute transport).	Time of Travel Drawdown	Dade Co., FL Broward Co.,FL Palm Beach, FL

* or being considered

The methods range in sophistication from those which can be applied simply by non-technicians (e.g., Fixed Arbitrary Radius) to very complex methods which require a highly trained, technical specialist (e.g., Numerical Flow/Transport Model). Each has inherent strengths and limitations which must be considered in method selection and program implementation. The less sophisticated forms can be easily applied and are relatively simple to administer. They are, however, less likely to reproduce actual conditions. They may therefore provide "inadequate" or "excessive" protection in different settings. More sophisticated methods more closely reproduce actual conditions, however, they are more expensive to implement and more complex to administer. Thus, certain tradeoffs or method combinations may be required when designing WHPA programs in order to adequately define the area to be protected.

A brief review of wellhead protection activities in selected states follows. While not exhaustive, this survey will give workshop participants an indication of what is already being done at the state and local level in wellhead protection.

State of Florida

Florida's state and county governments have some of the most sophisticated ground-water protection program in the nation. The state has also proposed amendments to Chapter 17-3 of the Florida Administrative Code that would establish a wellhead protection program for highly vulnerable aquifers. The program would require protection zones around wellheads in which land use controls would be used to restrict activities that could potentially contaminate the ground-water supply.

The proposed law establishes two protection zones around major public community drinking water supplies (with an average daily withdrawal of at least 100,000 gallons of ground-water). The zones are defined as two concentric areas around the major public water supply well(s) or wellfield(s) of 200 feet and five years ground-water travel time respectively.

Discharges into the ground-water from storm water facilities, underground storage facilities, underground transportation pipes and other sources are subject to varying degrees of control depending on their proximity to the wellhead.

The proposed law, for example, prohibits new discharges and new installations within the 200 foot zone of protection. Within the five year zone of protection, new discharges from several types of facilities are subject to varying levels of control and monitoring requirements. New discharge of industrial waste that contains hazardous constituents is prohibited and new discharge of treated domestic waste effluent is allowed provided a number of conditions are met.

Dade County, Florida

Dade County has developed a comprehensive wellhead protection program. The County's program consists of five elements: water management, water and wastewater treatment, land use policy, environmental regulation and enforcement, and public awareness and involvement. The program consists of an array of prohibitions, restrictions, permit requirements, land use tools and management controls designed to protect all of Dade County's public water supply wells from contamination by the approximately 900 substances the county has identified as hazardous. Features of the county's program include:

- Delineation of recharge areas around wellfields, using computer modeling
- An array of restrictions applied within designated wellfield protection zones. Examples include
  - No new activities involving hazardous materials
  - Annual permitting and inspection of all non-residential uses
  - Density restrictions within protection zones
  - Expedited sewering of unsewered protection areas
  - Expedited clean-up of known areas of contamination
- Information programs to educate the public concerning the importance and methods of protecting drinking water
- Treatment programs to adequately purify drinking water (including air stripping of volatile organics) and for safe disposal of wastewater and other wastes. Clean-ups of known sources of contamination are included
- A water management program, including canal construction, to protect wellfield recharge areas from existing contamination, and a monitoring program to verify the results
- A regulatory program including extensive permitting and inspection of all non-residential activities in wellfield areas plus extensive design criteria for development
- A land use control program prohibiting or limiting certain land uses in proximity to wellfields as a function of hydraulic travel time.

Furthermore, Dade County maintains a computerized inventory of contaminant sources and issues approximately 10,000 operating permits per year to recognized, non-residential, users within the delineated wellfield protection zones.

Massachusetts

Massachusetts implements its wellhead protection program through the Aquifer Land Aquisition Program (ALA). The goals of the program are to help local officials define the primary water recharge areas around public water supply wells, to work with local officials to properly address land uses within the recharge areas of these wells, and to reimburse eligible applicants for land aquired in the recharge area for water supply protection purposes. The program encourages a mix of strategic land aquisition and effective land use controls to achieve water well protection.

As part of the program the Massachusetts Department of Environmental Quality Engineering (DEQE) has defined 3 zones of contribution that compose the total recharge areas to a public well. Theoretically these 3 zones constitute the geographic area in which land uses may impact the drinking water supply well.

- Zone 1, the 400' radius or other designated area surrounding a water supply well, must be in compliance with DEQE Drinking Water Regulation (310 CMR 22.00)

- Zone II is that area of an aquifer which contributes water to a well under the most severe recharge and pumping conditions that can be realistically anticipated. It is bounded by the ground-water divides which result from pumping the well and by the edge of the aquifer with less permeable materials such as till and bedrock. At some locations, streams and lakes may form recharge boundaries.

- Zone III is that land area beyond the area of Zone II from which surface water and ground water drain into Zone II. The surface drainage area as determined by topography is commonly coincident with the ground-water drainage area and will be used to delineate Zone III. In some locations, where surface and ground-water drainage are not coincident, Zone III shall consist of both the surface drainage and the ground-water drainage areas.

The delineation and management of these 3 zones forms the basis of a competitive ALA grant program through which local governments compete to obtain funds from the state to purchase land for water well protection purposes.

The Commonwealth has restricted the reimbursement for land purchases to Zone II. The rationale for this decision was that Zone II areas consist of relatively permeable surficial deposits and represent the area of the municipality in which land uses have the greatest potential for adversely impacting the local water well(s). Zone I was eliminated from the reimbursement scheme because under Massachusetts law the water supplier is already required to control land use within the 400 foot radius surrounding the well.

The program requires applicants to supply four major categories of information: aquifer/water supply information, land use information, resource protection plans, and land aquisition information. Under the first category, Zones I, II and III must be delineated and mapped. Any pump tests or modelling used to delineate zones must be documented.

Some level of land use information must be supplied for all three zones. All major land use activities such as commercial, residential, agricultural, and industrial uses in Zone II must be mapped and public transportation and corridors identified. For areas in Zone III, only those land use activities that pose significant threats to ground water such as hazardous waste sites, surface impoundments, landfills, auto junkyards, underground storage tanks, salt storage sheds, and sand and gravel operations that occur in the zone, need be documented.

A water resource protection strategy that identifies existing and/or proposed land use controls designed to protect the supplies must be included in the package on the suggested land and/or easement purchase. The state uses this information to determine whether there is a sound basis for the locality aquiring the land and whether the town will indeed be able to complete the land aquisition should an award be granted.

All applications are ranked and prioritized based on two major criteria: the value and use of the resource and the degree of resource protection that can be expected from the proposed water protection strategy.

Vermont

The state is in the process of developing a state wide wellhead protection program. As part of this program, the Agency for Environmental Conservation is developing regulations that will be used to map the cone of influence, the primary recharge areas and the secondary recharge areas of water wells in Vermont. These maps will be used by AEC and other regulatory agencies in their permitting activities.

One tool currently available to state regulatory agencies in making management decisions are the existing maps of recharge areas or Aquifer Protection Areas that were delineated in the Vermont Aquifer Protection Area (APA) Project in the 1970's. The APA project resulted in 209 individual APA's located in 104 of Vermont's towns. These APAs are defined as the land surface area that encompasses the recharge, collection, transmission, and storage zones for a town's well or spring.

Eight categories of APAs were delineated based on hydrogeological factors:

- Wells in unconfined and leaky unconsolidated aquifers with available engineering pump tests.
- Wells in unconfined and leaky unconsolidated aquifers without engineering pump tests.
- Wells in confined unconsolidated aquifers.
- Bedrock wells, using an infiltration model
- Bedrock wells, using a leakage model
- Springs in unconsolidated material and at the interface between unconsolidated material and bedrock, with high relief in the upgradient direction
- Springs in unconsolidated material and at the interface between unconsolidated material and bedrock, with low relief in the ungradient direction
- Springs emanating from bedrock

There are no regulations associated with mapped APAs but existing state regulatory programs use APAs to flag areas needing special consideration during the review process on development applications.

European/Experience

At least eleven European countries have developed some form of wellhead protection concept, with West Germany and the Netherland having the most extensive experience in this area.

In both countries, the first protective zone lies immediately around the wellhead, with a secondary zone representing the distance that ground-water will travel in 50 (West Germany) or 60 (Netherlands) days. This second zone is designed to protect the well from microorganisms.

Each country then has a "water protection" area, comparable to the WHPA boundaries seen in the United States. In West Germany this zone extends to 2 kilometers from the well (until aquifer boundaries are reached) while in the Netherlands, the "protection zone" extends to 10 and 25 year travel times. These correspond approximately to distances of 800 meters and 1200 meters from the wells. Finally, an outermost zone is drawn, in each country, to the recharge area boundary. Within these zones, restrictions are imposed on a number of activities including, but no limited to, waste disposal sites, the transport and storage of hazardous chemicals, wastewater disposal, and the application or leachable pesticides. The degree of restriction decreases as the distance from the wellhead increases.

CHAPTER III
DEFINITION OF AN "ADEQUATE" STATE WHP PROGRAM

The previous chapters provided background material for the wellhead protection (WHP) and sole source aquifer (SSA) programs. The remainder of this workbook is devoted to presenting nine major issues that address key aspects of the programs. As mentioned before, the emphasis of this workshop is on the WHP program. The first issues, presented in this chapter, deal with the focus and timing of the WHP program; the next two chapters concentrate on the components of the program; and the final chapter assesses institutional relationships between states and localities.

Each chapter has the same format: a statement of the issues, statutory references, a set of options, and advantages and disadvantages of each. The options are presented as a starting point for discussion. They illustrate the range of viewpoints heard in earlier discussions on each issue. Participants should evaluate each option and are encouraged to combine options or to create new ones in order to recommend what they believe is most appropriate and realistic for the program.

This chapter addresses the orientation of an "adequate" program to protect wellhead areas. This is the first step in the process of developing a state WHP program as shown by the shaded area in Figure III-I. The two broad issues presented here differ from those presented later that deal with the specific components of an adequate state program. Those components are enumerated in the statute (see Subsection 1428 the Appendix I and also Chapter II in the workbook). According to Webster, "adequate" is defined as sufficient for a specific requirement, or as barely sufficient. EPA is not, then, charged with approving and providing funds for the best possible program, but for a satisfactory one. The guidance will, by necessity, allow for a great deal of flexibility on the part of various states to develop programs that adequately meet the goals of the Act; those that do are eligible to receive funds.

In this session, participants will address two questions. The first is the key issue in determining whether or not the Administrator will approve a state-submitted program:

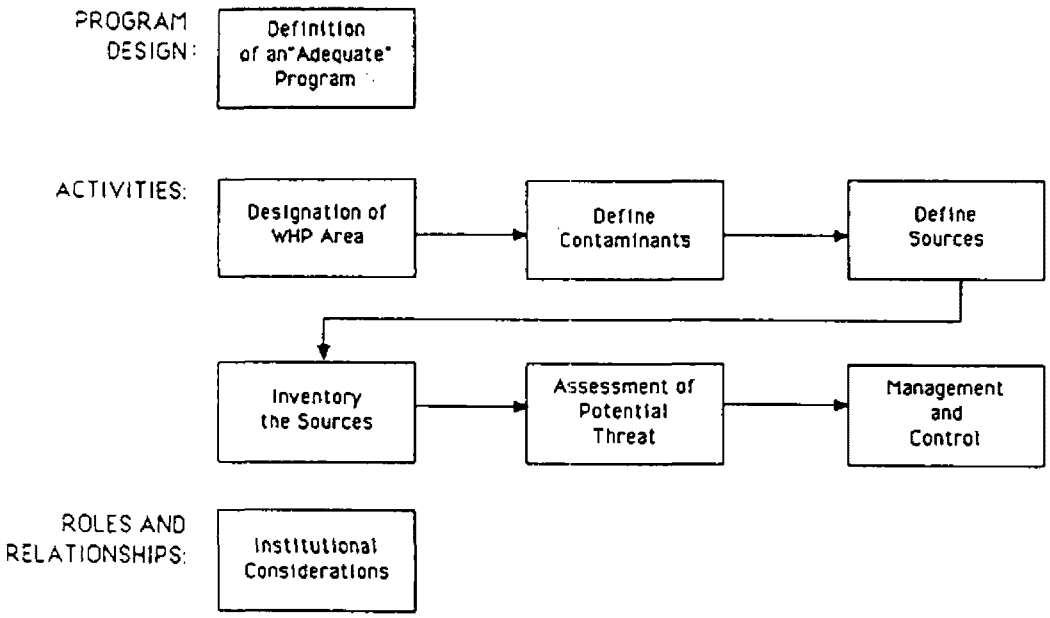
1. Which general programmatic approaches should EPA view as adequate?

The second considers the timing of actions taken in a state program:

2. On what basis may an adequate state program phase-in its delineation of wellheads and identification of sources?

FIGURE III - 1

Major Stages in Developing and Implementing a State WHP Program



ISSUE 1. WHICH PROGRAMMATIC APPROACHES SHOULD EPA VIEW AS ADEQUATE?

According to the statute, the EPA Administrator must disapprove a State program, or any portion of it, which is not adequate to protect public water systems from contaminants which may have any adverse effect on human health. In addition to this rather explicit statutory directive, the Congress has also directed EPA, in the conference report that accompanied passage of the law, to give states a great deal of flexibility in defining wellhead protection areas (WHPAs) and attendant protection programs. In the guidance, EPA must determine what overall standard it will use to determine whether a state program is "adequate" to meet the goals of the Act.

This general view of "adequacy" will have implications for the options discussed in later sessions on questions such as which potential contaminants and sources should be identified and what control measures should be applied.

Unlike later issues, where one or a few options may clearly be best for a particular issue, the question of what makes an adequate program has no single answer. There are many forms that an adequate program could take: it could be linked to a specific standard of ground-water quality, or it could be based on applying certain management practices to various potential pollutants.

In order to help OGWP develop its guidance on this matter, workshop participants will address the following question -- should EPA view the following programmatic approaches as adequate? If yes, are there certain conditions or circumstances under which a particular approach may not be adequate?

Given the breadth of this first issue, participants may conclude that all of the following options are acceptable; on the other hand, some may not fit in. Participants are encouraged to develop additional options as well. In reviewing any options, participants should consider the feasibility of implementing various options, and the statutory language.

Option 1 - One which provides for no degradation of ground-water quality

Advantages

- Would theoretically provide the highest level of protection to the ground-water resource and drinking water supply
- A number of states currently use this standard for the entire state or for highly sensitive areas

Disadvantages

- Implementation may well be infeasible in urban settings and beyond the financial and technical capacity of states and local entities
- States would have to develop elaborate models to show the program was working

Option 2 - One which provides wellhead protection by achieving drinking water standards for raw water entering the wellhead

Advantages

- Allows flexibility for source control measures as long as standards are met at the wellhead
- Extends requirements of the Act for finished water to raw water at the wellhead

Disadvantages

- Protects drinking water, but not necessarily the ground-water resource as a whole
- Does not address contaminants for which drinking water standards have not been issued
- States would have to develop models to apply this approach
- May be infeasible in urban and other areas

Option 3 - One which improves raw water quality to the extent that drinking water standards may be met using existing drinking water treatment technology

Advantages

- Easy to implement
- Would ensure that drinking water at the tap meets standards

Disadvantages

- May be inconsistent with the goals of the Act
- May discourage innovative source controls and encourage treatment of raw water
- Does not address contaminants for which there are no drinking water standards
- Inconsistent with most Federal and State ground-water programs which do not permit degradation of current drinking water supplies below drinking water standards

- Nearly all small systems drawing from ground water lack the ability to finance or maintain the sophisticated level of treatment needed to remove man-made chemicals

Option 4 - One which applies best management practices (BMP)/best engineering judgment (BEJ) to all sources of contamination within the WHPA

Advantages

- Focuses on attainment of technically and economically feasible quality standards in a given location
- Is similar to approach used in other EPA programs such as the Clean Air Act and Clean Water Act

Disadvantages

- BMP/BEJ may not lead to adequate levels of contaminants in ground water
- Requires definition of BMP/BEJ for a variety of sources

Option 5 - One that the State demonstrates is comparable with the approach of an adequate program as defined by the Technical Committee

Options 5 and 6 differ from the first four since adequacy is measured more subjectively. The first four options link adequacy to measurable indicators of water quality or to application of technology standards. Option 5 presumes development, by EPA's management protection plan committee, of a program scenario composed of elements selected from review of the options presented in both workshops. The State must then demonstrate how its program elements will produce effects similar to the EPA scenario.

Advantages

- The State is not limited to an overall goal that is infeasible or impractical in some cases

Disadvantages

- States must demonstrate how the effects of their approach compare with the effects of an acceptable program
- The program must describe the actions to be taken and their implementation; states could expand considerable effort in program development and rationalization

Option 6 - One that the State certifies has an objective that meets the statute's goal and its six specific elements

Like Option 5, Option 6 proposes a more subjective measure of adequacy. The State does not follow specific EPA guidelines, but instead certifies that its program will achieve the goal of the Act and includes the six elements listed in Section 1428(a).

Advantages

- Most flexible for the state

Disadvantages

- EPA would have difficulty ascertaining the effectiveness of the program
- States would lack a basis on which to judge EPA's action on their applications

ISSUE 2: ON WHAT BASIS MAY AN ADEQUATE STATE PROGRAM PHASE IN ITS DELINEATION OF WELLHEADS AND IDENTIFICATION OF SOURCES?

Section 1428(a) states that:

"The Governor or Governor's designee of each State shall, within 3 years of the date of enactment of the Safe Drinking Water Act Amendments of 1986, adopt and submit to the Administrator a State program to protect wellhead ares within their jurisdiction from contaminants which may have any adverse effect on the health of persons."

Subsection 1428(d) further states that:

"After the date 3 years after the enactment of this section, no State shall receive funds authorized to be appropriated under this section except for the purpose of implementing the program...."

The statute provides that after June 1989 States may receive funds only to implement their EPA-approved WHP programs that meet each of the program elements described in subsection 1428(a). States, therefore, will be ineligible for development funding after year three. In order to qualify for implementation funding, States will be required to submit their developed program plans to EPA for review and approval by the end of FY 89. Approved plans, then, will be eligible to receive implementation funding for subsequent program years.

EPA may have some latitude in interpreting the program requirements in subsection 1428(a) that States must meet in order to qualify for funding after FY 89. In considering this issue, EPA has determined that four of the six requirements present little problem in determining what must be required by year three. For example, 1428(a)(1) requires States to specify the duties of governmental entities that will have a part in the development and implementation of the State WHP program; States, therefore, would be required to provide EPA with a listing of each governmental unit involved. Such a requirement would place little burden on the State and is feasible within three years. A more complicated requirement is in Section 1428(a)(3):

"identify within each wellhead protection area all potential anthropogenic sources of contaminants...."

These options deal with the timing of this requirement.

Option 1 - Within three years states must identify each WHPA around all public water systems[1] within its borders and identify specifically all sources of anthropogenic pollution within each wellhead; all activities for these elements are ineligible for funding after FY 89

Advantages

- Is the simplest option for which to provide implementation guidance to States
- Requires States to expedite their programs and would speed actual work for addressing potential WHP problems
- May help direct WHP funds to implementation rather than program development

Disadvantages

- Is not an implementable option in most States
- Does not take into account the limited amount of funds that States will probably receive and have available within the State to accomplish these actions
- Stresses completion of the program at the expense of more thorough planning and priority setting
- May limit State participation in the WHP program because the requirements are too strict

Option 2 - Within three years states must determine, through a mechanism such as a general rule, all WHPAs within its borders and identify generically all sources of anthropogenic pollution within each wellhead

Advantages

- States may refine (e.g., more fully characterize specific characteristics of WHPAs) these elements after FY 89 as a part of program implementation
- May help direct WHP monies to implementation rather than development; also would help expedite the actual "field work" of delineating and inventorying
- Better takes into account a State's financial and other resource limitations

---

1 Public water systems include community water supply systems and non-community water supply systems, e.g., truck stops, restaurants, schools.

Disadvantages

- Presents problems in strictly definng "development" vs. "implementation" in guidance to recipients/applicants. Also may complicate EPA audits of recipients' financial records, since it may be very difficult to distinguish where development ends and implementation begins

- May limit State participation in the WHP program because the requirements are too strict

- May still be impractical to implement

Option 3 - Within three years states must determine WHPAs only for large (e.g., serving over 500 people) community water systems, and reserve smaller CWS and non-CWS for FY 90 and after; contamination sources are addressed generically

Advantages

- Provides clear priority for areas with higher population risk

- More realistic to implement

- Consistent with rules regarding public water system testing and State well registration programs

Disadvantages

- Phasing is inconsistent with statute

- Ignores factors other than population that may increase risk in a wellhead

Option 4 - Within three years states must submit only plans for determining WHPAs and identifying pollution sources; costs for developing these plans are ineligible for funding after FY 89, but States can receive funding for implementing these plans later

Advantages

- More time available to set priorities

- Takes into account States' differing capabilities, resource availability, and workloads

- Will allow for more State participation in the WHP program than either Option 1 or 2

Disadvantages

- Does not fulfill the statutory requirements of Section 1428(d)
- Directs a higher proportion of WHP authorized funds to planning rather than delineating wellhead areas and inventorying sources
- Like Option 2, may pose a problem to EPA in defining the exact point where development ends and implementation begins

CHAPTER IV
IDENTIFICATION OF CONTAMINANTS AND SOURCES

During this session of the workshop, participants will address three issues (see Figure IV-1). The first two define key terms in the statute that specify important parameters to be considered in EPA's grant guidance for the WHP and SSA programs:

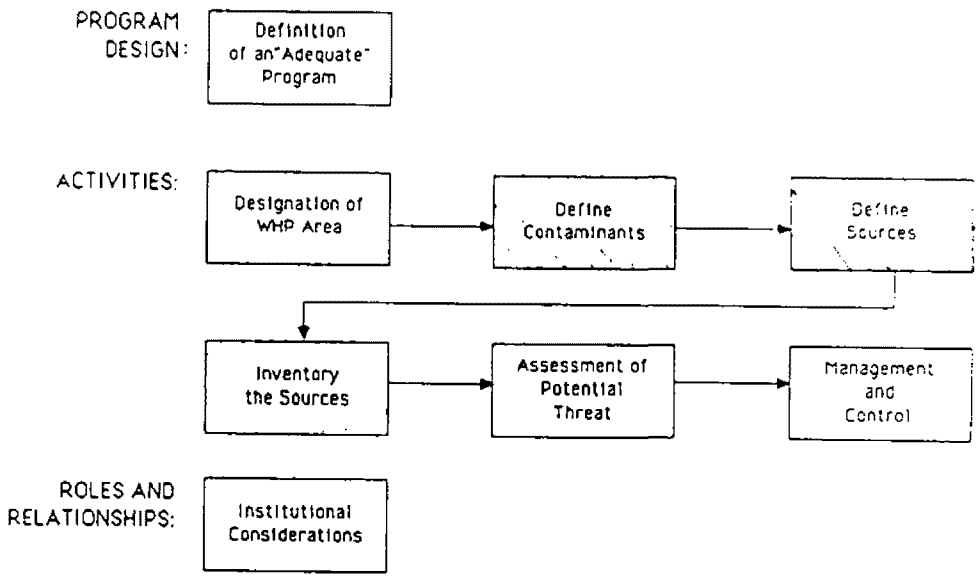
1. How should EPA define the term "contaminants" in the guidance for states or implementing agencies in the two programs and

2. How should EPA define a source of contamination in the guidance?

The third incorporates these definitions in setting the scope of the source identification program:

3. What is an "adequate" program to inventory sources of contamination under the two programs?

FIGURE IV - 1
Major Stages in Developing and Implementing a State WHP Program



The statutory reference for these three issues comes from Section 1428(a)(3) which requires states to:

"Identify within each wellhead protection area all potential anthoropogenic sources of contaminants which may have any adverse effect on the health of persons;"

The resolution of these issues depends largely on the program goals and objectives discussed in the earlier session. In subsequent sessions participants will discuss management and

control of these sources, so these issues also provide the context for later.

In evaluating the various options under each issue, the participants should consider:

- The goals and objectives set out in the earlier session
- The technical and practical capability of the implementing agency(ies)
- The interests of affected parties in the states and localities, and
- Encouraging state participation in the programs.

ISSUE 1: HOW SHOULD EPA DEFINE "CONTAMINANTS?"

The statute specifies that, as part of an adequate program, the state must identify all potential anthropogenic sources of contaminants within each wellhead protection area. The definition of contaminants will have a substantial effect on the scope and focus of the program. The different options combine elements of two basic questions: how extensive is the list of contaminants and who selects them.

A very broad contaminant definition implies that states must consider a wide variety of sources. As a result, one would expect a broad definition to lead to a more protective program, while adding to the burden of assessing all of the listed contaminants and implementing the program. As we consider narrower sets of contaminants, the implementation burden decreases, but so does the completeness of the inventory and assessment. On the other hand, adding more contaminants may not always increase benefits since in some cases we may not have an adequate scientific basis for acting on all possible contaminants. The key to resolving this question is how to strike the balance between technical scope and implementation feasibility.

The second basic question is who selects the contaminants. One option is that the guidance could identify lists of contaminants from Federal programs. As the definition becomes more open-ended, i.e., a broad Federal list with flexibility for states to add other contaminants, the coverage of contaminants will become less uniform across programs and more subject to local pressures.

The following five options lay out different aspects of these two basic questions; they range from most to least broad in terms of coverage of contaminants. Each option is accompanied by a list of advantages and disadvantages. As in each session, participants should evaluate these options, but should not be limited to only these five; these are intended as a starting point for discussion.

Option 1 - Contaminants regulated under key Federal environmental programs, those of the specific state, and any others that the state determines are appropriate

Advantages

- Programs include a comprehensive set of contaminants
- Enables states to factor in their own specific problems

Disadvantages

- Resource intensive for the states
- May be inconsistent with a more targeted approach

Option 2 - Contaminants drawn from all Federal statutes and regulations (e.g., SDWA, RCRA Appendix VIII) that specify ground-water or drinking water standards

Advantages

- Important contaminants, as defined by the Federal government, are addressed in each State
- Health effects data are available for many of these contaminants
- Lists already exist and are familiar
- States can always add to list

Disadvantages

- Not all contaminants that may cause health problems are regulated under Federal laws

Option 3 - Contaminants regulated under the State's programs

Advantages

- Gives states flexibility to target the most important contaminants in these areas
- State programs may include larger numbers of contaminants than Federal programs

Disadvantages

- Some states have embryonic ground-water programs and might not address a full range of contaminants
- National program will not have common constituents across states
- Some states may exempt certain classes of contaminants due to economic or political considerations

Option 4 - Contaminants regulated and included in health advisories under the SDWA

Advantages

- These contaminants have documented effects on human health
- A relatively simple, short list will provide national consistency and not tax technical capabilities of states to implement program

- Links the WHP program to the other parts of the SDWA
- The number of contaminants in this category is being expanded significantly over the next few years
- States can add to the list

Disadvantages

- Only a limited number of contaminants are addressed under the SDWA compared to the number that appear in ground water

Option 5 - No definition in guidance

The State would determine for itself which contaminants to address in a WHPA. EPA would not even provide a basic list to which States could add contaminants.

Advantages

- Provides maximum flexibility for states

Disadvantages

- States may not include all contaminants that have potential effects on human health
- Shifts burden to states to develop list or definition
- Does not provide EPA with a standard against which to measure the adequacy of a state's program

Option 3 - All sources that are currently regulated by the Federal government or the State

Advantages

- All currently regulated sources will be addressed in the program
- Sources are already identified; less resource intensive
- States can add to their list

Disadvantages

- Does not include sources of contamination that are unregulated

Option 4 - Sources of contamination are defined as the 33 sources listed in the OTA Report

Advantages

- List covers a majority of the source categories of concern
- List has served as the basis for Congressional hearings
- States can add to their list

Disadvantages

- List is not comprehensive
- Source categories are not always consistent with EPA or state programs

Option 5 - No specific definition of source would be provided in the guidance

As with the final option in the previous issue, states are on their own to determine which sources would be considered in an adequate program.

Advantages

- Maximum state flexibility

Disadvantages

- Uncertainty regarding what states would consider in their programs
- Implementing agency would have to expend considerable effort to develop a methodology and list
- State could choose not to include some sources

ISSUE 3: WHAT CONSTITUTES AN ADEQUATE PROGRAM FOR INVENTORYING SOURCES OF CONTAMINATION UNDER THE STATE PROGRAM?

The statute, referenced at the beginning of this chapter, requires states to "identify" sources within each WHPA. Inventory means to identify in some fashion. The acceptability of an inventory program clearly depends on the definitions discussed above. More detailed definitions imply that a more complete inventory is necessary and that substantial resources are required. At the same time, practical considerations suggest that even an extensive list of sources and contaminants need not imply a census of, for example, every single septic system.

The inventory must provide the basis for assessing sources' potential for affecting the wellhead. As such, it dictates the level of detail with which sources are addressed. The key difference between the options discussed below is the extent to which they address individual, as opposed to classes of, sources. If the inventory focuses on individual sources, subsequent assessment and control decisions will tend to be very specific. If some or all of the sources are included in categories, e.g., septic systems within the WHP area, assessments will be broader and the implementing agency might consider categorized approaches to controls, such as the use of best engineering practices.

In evaluating these options, participants should consider additional options or combinations of existing ones.

Option 1 - A full inventory of every specific source within the wellhead protection areas

Advantages

- Each source is identified, enabling the state to assess individual sources and design individualized management and control actions
- The statute could be read to require this detailed response

Disadvantages

- The inventory will require extensive effort and resources
- The effort may not be cost-effective for unregulated sources and non-point sources

Option 2 - Identification of all currently regulated sources with a general categorization of unregulated or diffuse sources (e.g. septic systems)

Advantages

- Currently regulated sources are addressed individually while resources are conserved by grouping smaller or diffuse sources
- Effects of unregulated or diffuse sources are assessed in combination, which is the level at which these sources (e.g., septic systems, pesticides application) may pose a ground-water problem

Disadvantages

- May still be resource intensive

Option 3 - General, uniform inventory of each source category (e.g., pesticide use)

Advantages

- This is the least resource intensive option

Disadvantages

- May be incompatible with statutory language
- Assumes that currently regulated sources are appropriately controlled by existing programs
- Cannot identify and assess individual, currently regulated sources

Option 4 - The type of inventory, individual or group, is justified by the state based on a broad performance standard (see Issue 1 of first session)

Under this option, the inventory approach is linked to the program scope established in the first session (Issue 1). If, for example, water quality standards are already met in a WHPA, the inventory may be very limited.

Advantages

- Inventory is tailored to match program goals

Disadvantages

- Must justify the inventory method chosen in each case based on the program goals
- In WHP areas of secondary concern, currently regulated sources will not be identified and assessed individually
- Statute requires all potential sources to be inventoried

Option 5 - Details of the inventory are left to the states

The State would determine for itself the level of detail in the inventory, without EPA's stipulation of a minimum approach.

Advantages

- Maximum flexibility for states

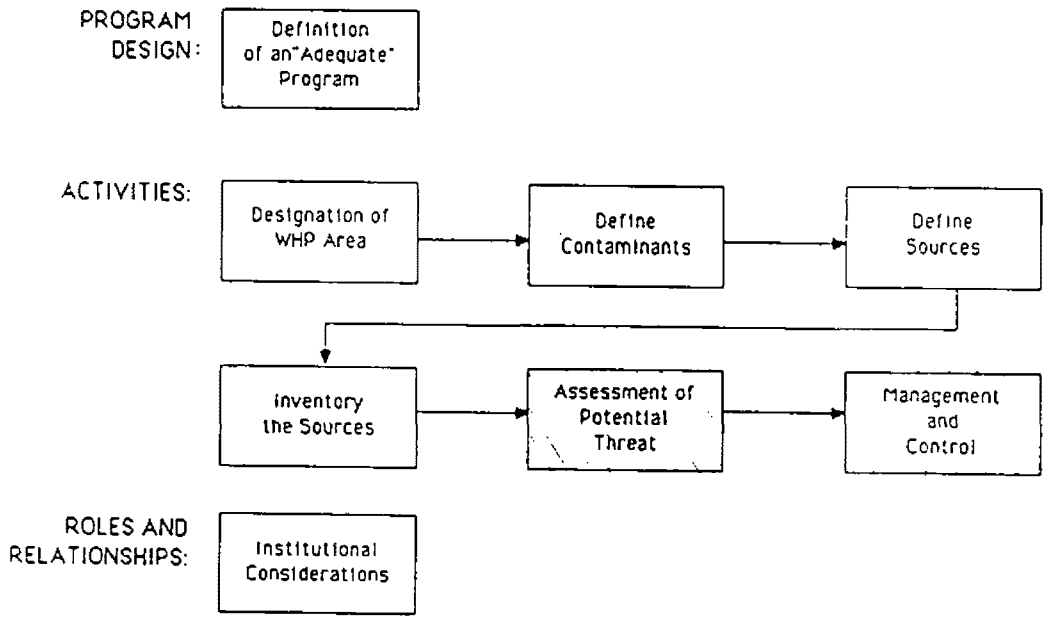
Disadvantages

- Additional resources required from state to develop process
- EPA cannot compare the inventory to a standard, so will spend more reviewing its adequacy
- Major sources may be overlooked due to local pressures

CHAPTER V
ASSESSMENT AND CONTROLS -- WHEN AND HOW TO RESPOND TO POTENTIAL THREATS

After addressing the scope of the WHP program by defining the WHP area, the sources, and contaminants, state programs must consider the assessment and response to sources within the WHP area. This is shown schematically in Figure V-1.

FIGURE V - 1
Major Stages in Developing and Implementing a State WHP Program



In this session, participants will address two related issues; the first deals with the assessment of sources:

1. What assessment is necessary to determine which inventoried sources must be addressed in an adequate program?

The second issue shifts the focus to the means by which sources are addressed.

2. Must an adequate program include a specific control or other management approach for each source of contamination identified in a WHP area?

Both issues are based on the same statutory language, found in Section 1428 (a). The state program shall:

> "(4) describe a program that contains, as appropriate, technical assistance, financial assistance, implementation of control measures, education, training, and demonstration projects to protect the water supply within wellhead protection areas from such contaminants...."

In reviewing the range of options presented under each issue, the participants should keep in mind the standards for adequacy discussed in the previous session, the technical and practical capability of the implementing agency(ies), and the relationship between states and localities. Participants will focus on state and local relationships in the final session on institutional arrangements, but these issues may also surface in the context of considering controls or management approaches.

Participants in the concurrent session are beginning with issues surrounding the identification of sources of contamination within a WHP area. Participants in this session should assume, therefore, that a list of sources will be available.

ISSUE 1: WHAT TYPE OF ASSESSMENT IS NECESSARY TO DETERMINE WHICH INVENTORIED SOURCES MUST BE ADDRESSED IN AN ADEQUATE PROGRAM?

This issue focuses on the assessment of the inventoried and what controls might be appropriate. The assessment is a key provision on which a state can base its determination of appropriateness. The language of the statute suggests that states do not have to impose control measures on every inventoried source; instead, measures are imposed as appropriate. Participants should bear in mind the range of controls or management approaches listed in the statute: technical and financial assistance, implementation of controls, education and training, and demonstration projects.

The options presented vary depending on the level of complexity of the assessment. We begin with a presumption that all inventoried sources pose a potential threat to ground water and must be addressed. To justify exclusion of some sources, states may consider different types of assessments. On the one hand, the guidance might require states to conduct risk assessments of sources in order to determine their impact on the WHP area. The level of information required to complete such an assessment would add to the resources required for the program and would require a rather specific inventory of sources.

Alternatively, the guidance may require a much simpler screen based on qualitative criteria. Individual states could then determine how much more extensive an assessment they will require in the assessment part of the program.

Option 1 - Any source within a WHP area is assumed to pose contamination risks and require some level of control or other management approach

Advantages

- No individual assessments are performed or required
- All sources are controlled

Disadvantages

- No sources are exempt from controls
- Resources may be wasted controlling sources that do not pose a risk to human health
- Statute describes use of controls or other management approaches "as appropriate"

Option 2 - Risk assessment must be used to show that no problem exists and therefore that no controls or other management approaches are needed

Unlike the first option, the subsequent options describe how states can justify exclusion of some sources from controls or other management approaches. This option has the most stringent hurdle, completing a risk assessment.

Advantages

- Sources posing risk are identified and ranked
- Potential impacts of sources can be quantified
- Would result in the most efficient allocation of control resources

Disadvantages

- Formal analyses require large amounts of data
- Risk assessments also require high levels of staff expertise
- The assessments are, therefore, very expensive
- Because of the expense required to delete a source, some sources posing no risk may be controlled

Option 3 - A general assessment is sufficient to show that some sources pose no contamination threat and therefore need no controls or other management approaches

This option provides for a slightly less stringent standard if a state wishes to exclude some sources from responsibility for controls or other management approaches.

Advantages

- The state saves resources in situations in which controls are obviously unnecessary
- Resources are redirected to more serious sources

Disadvantages

- General screens may eliminate too many or too few sources
- Sources may tie-up state with requests for these exemptions

Option 4 - The State may exempt sources from controls or other management approaches, based on its program's goals

This option includes no standard for a state to employ in deciding which sources are free from responsibility for controls or other management approaches. The state may make its own determination.

Advantages

- The assessment of sources needing control is linked to overall program goals
- Less stringent proof required to show that no control is needed

Disadvantages

- The relationship between sources and contamination could be more easily challenged
- It may be difficult and expensive to establish this relationship consistent with the goals
- May lead to inconsistent levels of protection across the country

ISSUE 2: MUST AN ADEQUATE PROGRAM INCLUDE A SPECIFIC CONTROL OR OTHER MANAGEMENT APPROACH FOR EACH SOURCE OF CONTAMINATION IDENTIFIED IN A WHP AREA?

The inventory and assessment are likely to address a range of source types, some of which are currently regulated by the federal or state government and some that are not. The range of options included for discussion consider leaving currently regulated sources alone, enhancing existing controls, or imposing new controls. States could choose similar approaches for non-regulated sources, adding new controls only to these sources or focusing exclusively on already regulated sources. The range of control or other management approaches described in the statute is quite broad: technical and financial assistance, implementation of control measures, education, training, and demonstration projects. Many of these may be directed at control measures already on the books in states, but which may require additional enforcement or publicity.

States may also choose to set priorities for controlling sources independently of existing regulations and controls. Given the number of sources that may exist in a WHPA this approach would require a detailed assessment of individual sources and source categories.

A final consideration is the range of management techniques applied. One might expect controls to differ between different source types, but even within a source category (e.g., storage tanks) a range of control or other management approaches may be appropriate, depending on the characteristics of the WHPA.

Option 1 - In an adequate program, each source is addressed by a new control or other protection measure, selected to achieve the State's program goal

Advantages

- States have discretion in determining appropriate responses for all identified sources

Disadvantages

- EPA must review program based on completeness of coverage and suitability of the measure chosen
- Duplication and disruption of existing programs is likely
- May undermine credibility of existing regulatory requirements

Option 2 - In an adequate program, creation of new or enhancement of existing control and other protection measures are considered for all identified sources

Advantages

- Takes into account current programs and controls
- Provides a review of all identified sources

Disadvantages

- Review of existing measures may be resource intensive
- Invites challenges to definitions of enhancements and existing measures
- Some states' laws prohibit imposition of standards that are more stringent than those federally required

Option 3 - In an adequate program, only sources not addressed by existing state or federal programs need to be covered by a control or other protection program

Advantages

- Most flexible for states and localities in terms of imposing controls or other management practices
- Duplication and disruption of existing programs are not problems

Disadvantages

- Information on these sources may be difficult to obtain
- Existing programs could be inadequate to protect wellhead areas as required by the Act

Option 4 - In an adequate program, the need for additional controls or management is reviewed only for federally-regulated sources

Advantages

- Most focused option in terms of targetting sources

Disadvantages

- Implies that other sources are of lesser importance in protecting the wellhead
- Implies that existing programs do not protect ground water adequately, causing conflicts within EPA and with states
- Some States' laws prohibit imposition of standards more stringent than those federally required

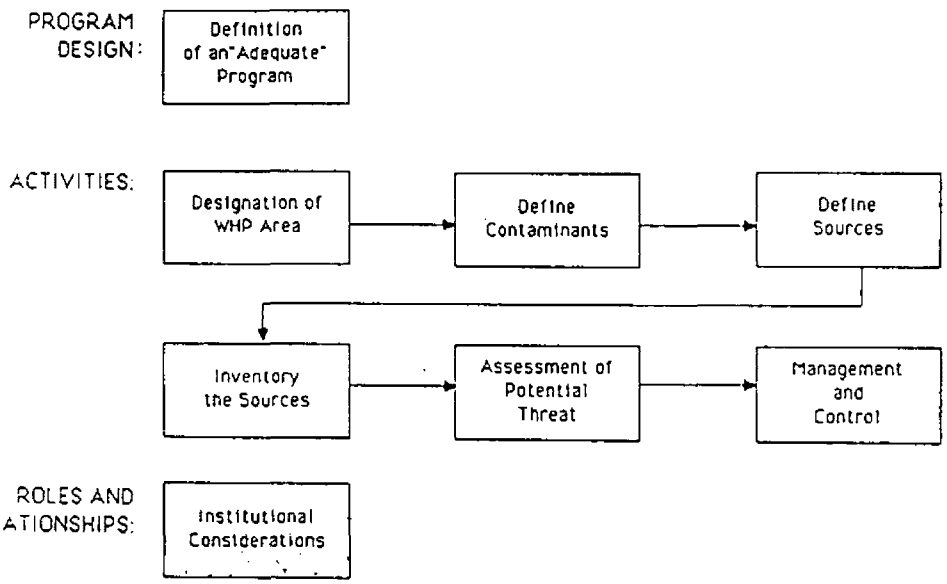
CHAPTER VI
INSTITUTIONAL CONSIDERATIONS

During this session of the workshop, participants will be asked to address the final topics of concern, namely the roles and relationships of state and local authorities in effectively implementing and enforcing a wellhead protection program (see Figure VI-1). The key questions are:

1. To what extent would an adequate program make use of or enhance existing state and local programs and regulatory requirements to carry out protection for WHP areas?

2. To what extent must the implementing agency demonstrate, in the program application, its ability to ensure coordination in implementation of the plan by appropriate state and local entities?

FIGURE VI - 1
Major Stages in Developing and Implementing a State WHP Program



The applicable statutory language, Subsection 1428(a), requires that an adequate program:

> "specify the duties of state agencies, local governmental entities, and public water supply systems with respect to the development and implementation of programs required by this section."

Underlying these issues is EPA's recognition of the sensitivity that it must bring to bear in dealing with the state

and local governments in areas such as land use and ground-water protection. To the extent possible, EPA wants to ensure that the WHP program is administered in a manner that is consistent with existing State ground-water protection strategies and plans.

The major question for participants to address is how does EPA, while respecting the primary role of the states, ensure that sufficient coordination will occur to allow for the implementation of an adequate program?

ISSUE 1 - TO WHAT EXTENT WOULD AN ADEQUATE PROGRAM MAKE USE OF OR ENHANCE EXISTING STATE AND LOCAL PROGRAMS AND REGULATORY REQUIREMENTS TO CARRY OUT PROTECTION FOR WHP AREAS

The subquestion to this issue is, in implementing an adequate program, should the state create a new agency or institution, or should it employ existing state and local programs.

Option 1 - An adequate program will utilize, to the maximum extent possible, existing state statutes, regulations, and agencies

Advantages

- No need for new state bureaucracy
- Avoids duplication of effort
- More expeditious implementation

Disadvantages

- May have program conflicts within existing agencies
- May lack authority in dealing with non-related state agencies or with federal agencies

Option 2 - Encourage, where possible, new institutions to implement the programs

Advantages

- Institutions could be specifically tailored to the needs of the program

Disadvantages

- Could lead to duplication of effort with existing State and local programs
- May be more costly to the states

Option 3 - An adequate program need not address this question

Advantages

- Maximum flexibility to state

Disadvantages

- Could limit integration with existing state programs
- Would not fulfill statutory requirement to indicate the roles of state and local agencies in developing and implementing the programs

ISSUE 2 - TO WHAT EXTENT MUST THE IMPLEMENTING AGENCY DEMONSTRATE, IN THE PROGRAM APPLICATION, ITS ABILITY TO ENSURE COORDINATION IN IMPLEMENTATION OF THE PLAN BY APPROPRIATE STATE AND LOCAL ENTITIES

Implementation of an adequate program may well require that a number of diverse agencies and services operate together in new ways. For example, local zoning agencies may have to coordinate efforts with public health agencies.

The means of achieving such coordination could include:

- New state legislation authorizing a designated implementing agency to manage and coordinate all State agencies and local entities for the purposes of carrying out the WHP program
- A Governor's executive order establishing a special task force, commission or oversight committee to manage and coordinate all State agencies and local entities participating in the WHP program
- A Governor's designation of a lead agency to manage and coordinate all State agencies and local entities participating in the WHP program

In all cases, the test of adequacy will be whether there is sufficient management and coordination authority to administer the program's operational requirements.

Option 1 - Require that the identified State Implementing Agency demonstrate some statutory authority by which it can manage and coordinate the program among all participating entities

Advantages

- Would provide a legal basis for adequate program management and coordination among several agencies and entities at both the State and local levels of activity

Disadvantages

- May not be legally feasible
- May take too long

Option 2 - Require a demonstration of some administrative mechanism (e.g., a Governor's Task Force or Oversight Committee) by which program management and coordination will occur

Advantages

- Could provide adequate program management and coordination without need for new legislation

Disadvantages

- May not be effective without statutory underpinning

Option 3 - Require identification of a lead agency to be responsible for managing and coordinating the efforts of program implementation

Advantages

- Is the simplest means of providing program management and coordination

Disadvantages

- Mere designation of a lead agency may not adequately ensure needed coordination
- May cause "turf" problems within a state

Option 4 - Require no showing of management and coordination ability: simply require a listing of duties by Agency or jurisdiction

Advantages

- Maximum flexibility to the states

Disadvantages

- This option is the least likely to provide adequate program management and coordination

APPENDIX I

Ground-Water Portions of Safe Drinking Water Act Amendments of 1986

SEC. 203. SOLE SOURCE AQUIFER DEMONSTRATION PROGRAM.

Part C of the Safe Drinking Water Act is amended by adding the following new section after section 1426:

"SEC. 1427. SOLE SOURCE AQUIFER DEMONSTRATION PROGRAM.

"(a) PURPOSE.—The purpose of this section is to establish procedures for development, implementation, and assessment of demonstration programs designed to protect critical aquifer protection areas located within areas designated as sole or principal source aquifers under section 1424(e) of this Act.

"(b) DEFINITION.—For purposes of this section, the term 'critical aquifer protection area' means either of the following:

"(1) All or part of an area located within an area for which an application or designation as a sole or principal source aquifer pursuant to section 1424(e), has been submitted and approved by the Administrator not later than 24 months after the enactment of the Safe Drinking Water Act Amendments of 1986 and which satisfies the criteria established by the Administrator under subsection (d).

"(2) All or part of an area which is within an aquifer designated as a sole source aquifer as of the enactment of the Safe Drinking Water Act Amendments of 1986 and for which an areawide ground water quality protection plan has been approved under section 208 of the Clean Water Act prior to such enactment.

"(c) APPLICATION.—Any State, municipal or local government or political subdivision thereof or any planning entity (including any interstate regional planning entity) that identifies a critical aquifer protection area over which it has authority or jurisdiction may apply to the Administrator for the selection of such area for a demonstration program under this section. Any applicant shall consult with other government or planning entities with authority or jurisdiction in such area prior to application. Applicants, other than the Governor, shall submit the application for a demonstration program jointly with the Governor.

"(d) CRITERIA.—Not later than 1 year after the enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall, by rule, establish criteria for identifying critical aquifer pro-

tection areas under this section. In establishing such criteria, the Administrator shall consider each of the following:

"(1) The vulnerability of the aquifer to contamination due to hydrogeologic characteristics.

"(2) The number of persons or the proportion of population using the ground water as a drinking water source.

"(3) The economic, social and environmental benefits that would result to the area from maintenance of ground water of high quality.

"(4) The economic, social and environmental costs that would result from degradation of the quality of the ground water.

"(e) CONTENTS OF APPLICATION.—An application submitted to the Administrator by any applicant for a demonstration program under this section shall meet each of the following requirements:

"(1) The application shall propose boundaries for the critical aquifer protection area within its jurisdiction.

"(2) The application shall designate or, if necessary, establish a planning entity (which shall be a public agency and which shall include representation of elected local and State governmental officials) to develop a comprehensive management plan (hereinafter in this section referred to as the 'plan') for the critical protection area. Where a local government planning agency exists with adequate authority to carry out this section with respect to any proposed critical protection area, such agency shall be designated as the planning entity.

"(3) The application shall establish procedures for public participation in the development of the plan, for review, approval, and adoption of the plan, and for assistance to municipalities and other public agencies with authority under State law to implement the plan.

"(4) The application shall include a hydrogeologic assessment of surface and ground water resources within the critical protection area.

"(5) The application shall include a comprehensive management plan for the proposed protection area.

"(6) The application shall include the measures and schedule proposed for implementation of such plan.

"(f) COMPREHENSIVE PLAN.—

"(1) The objective of a comprehensive management plan submitted by an applicant under this section shall be to maintain the quality of the ground water in the critical protection area in a manner reasonably expected to protect human health, the environment and ground water resources. In order to achieve such objective, the plan may be designed to maintain, to the maximum extent possible, the natural vegetative and hydrogeological conditions. Each of the following elements shall be included in such a protection plan:

"(A) A map showing the detailed boundary of the critical protection area.

"(B) An identification of existing and potential point and nonpoint sources of ground water degradation.

"(C) An assessment of the relationship between activities on the land surface and ground water quality.

"(D) Specific actions and management practices to be implemented in the critical protection area to prevent adverse impacts on ground water quality.

"(E) Identification of authority adequate to implement the plan, estimates of program costs, and sources of State matching funds.

"(2) Such plan may also include the following:

"(A) A determination of the quality of the existing ground water recharged through the special protection area and the natural recharge capabilities of the special protection area watershed.

"(B) Requirements designed to maintain existing underground drinking water quality or improve underground drinking water quality if prevailing conditions fail to meet drinking water standards, pursuant to this Act and State law.

"(C) Limits on Federal, State, and local government, financially assisted activities and projects which may contribute to degradation of such ground water or any loss of natural surface and subsurface infiltration of purification capability of the special protection watershed.

"(D) A comprehensive statement of land use management including emergency contingency planning as it pertains to the maintenance of the quality of underground sources of drinking water or to the improvement of such sources if necessary to meet drinking water standards pursuant to this Act and State law.

"(E) Actions in the special protection area which would avoid adverse impacts on water quality, recharge capabilities, or both.

"(F) Consideration of specific techniques, which may include clustering, transfer of development rights, and other innovative measures sufficient to achieve the objectives of this section.

"(G) Consideration of the establishment of a State institution to facilitate and assist funding a development transfer credit system.

"(H) A program for State and local implementation of the plan described in this subsection in a manner that will insure the continued, uniform, consistent protection of the critical protection area in accord with the purposes of this section.

"(I) Pollution abatement measures, if appropriate.

"(g) PLANS UNDER SECTION 208 OF THE CLEAN WATER ACT.—A plan approved before the enactment of the Safe Drinking Water Act Amendments of 1986 under section 208 of the Clean Water Act to protect a sole source aquifer designated under section 1424(e) of this Act shall be considered a comprehensive management plan for the purposes of this section.

"(h) CONSULTATION AND HEARINGS.—During the development of a comprehensive management plan under this section, the planning entity shall consult with, and consider the comments of, appropriate officials of any municipality and State or Federal agency which has jurisdiction over lands and waters within the special protection

area, other concerned organizations and technical and citizen advisory committees. The planning entity shall conduct public hearings at places within the special protection area for the purpose of providing the opportunity to comment on any aspect of the plan.

"(i) APPROVAL OR DISAPPROVAL.—Within 120 days after receipt of an application under this section, the Administrator shall approve or disapprove the application. The approval or disapproval shall be based on a determination that the critical protection area satisfies the criteria established under subsection (d) and that a demonstration program for the area would provide protection for ground water quality consistent with the objectives stated in subsection (f). The Administrator shall provide to the Governor a written explanation of the reasons for the disapproval of any such application. Any petitioner may modify and resubmit any application which is not approved. Upon approval of an application, the Administrator may enter into a cooperative agreement with the applicant to establish a demonstration program under this section.

"(j) GRANTS AND REIMBURSEMENT.—Upon entering a cooperative agreement under subsection (i), the Administrator may provide to the applicant, on a matching basis, a grant of 50 per centum of the costs of implementing the plan established under this section. The Administrator may also reimburse the applicant of an approved plan up to 50 per centum of the costs of developing such plan, except for plans approved under section 208 of the Clean Water Act. The total amount of grants under this section for any one aquifer, designated under section 1424(e), shall not exceed $4,000,000 in any one fiscal year.

"(k) ACTIVITIES FUNDED UNDER OTHER LAW.—No funds authorized under this subsection may be used to fund activities funded under other sections of this Act or the Clean Water Act, the Solid Waste Disposal Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 or other environmental laws.

"(l) REPORT.—Not later than December 31, 1989, each State shall submit to the Administrator a report assessing the impact of the program on ground water quality and identifying those measures found to be effective in protecting ground water resources. No later than September 30, 1990, the Administrator shall submit to Congress a report summarizing the State reports, and assessing the accomplishments of the sole source aquifer demonstration program including an identification of protection methods found to be most effective and recommendations for their application to protect ground water resources from contamination whenever necessary.

"(m) SAVINGS PROVISION.—Nothing under this section shall be construed to amend, supersede or abrogate rights to quantities of water which have been established by interstate water compacts, Supreme Court decrees, or State water laws; or any requirement imposed or right provided under any Federal or State environmental or public health statute.".

SEC. 204. EMERGENCY POWERS.

Section 1431 of the Safe Drinking Water Act is amended as follows:

(1) In the first sentence of subsection (a) add the words "or an underground source of drinking water" after the words "to enter a public water system".

(2) In the last sentence of subsection (a) add "including orders requiring the provision of alternative water supplies by persons who caused or contributed to the endangerment," after the words "including travelers),".

(3) In subsection (b):

(A) Strike "willfully".

(B) Strike "fined not more than" and insert in lieu thereof "subject to a civil penalty of not to exceed".

SEC. 205. STATE PROGRAMS TO ESTABLISH WELLHEAD PROTECTION AREAS.

The Safe Drinking Water Act is amended by adding the following new section after section 1427, as added by section 203 of this Act:

"SEC. 1428. STATE PROGRAMS TO ESTABLISH WELLHEAD PROTECTION AREAS.

"(a) STATE PROGRAMS.—The Governor or Governor's designee of each State shall, within 3 years of the date of enactment of the Safe Drinking Water Act Amendments of 1986, adopt and submit to the Administrator a State program to protect wellhead areas within their jurisdiction from contaminants which may have any adverse affect on the health of persons. Each State program under this section shall, at a minimum—

"(1) specify the duties of State agencies, local governmental entities, and public water supply systems with respect to the development and implementation of programs required by this section;

"(2) for each wellhead, determine the wellhead protection area as defined in subsection (e) based on all reasonably available hydrogeologic information on ground water flow, recharge and discharge and other information the State deems necessary to adequately determine the wellhead protection area;

"(3) identify within each wellhead protection area all potential anthropogenic sources of contaminants which may have any adverse effect on the health of persons;

"(4) describe a program that contains, as appropriate, technical assistance, financial assistance, implementation of control measures, education, training, and demonstration projects to protect the water supply within wellhead protection areas from such contaminants;

"(5) include contingency plans for the location and provision of alternate drinking water supplies for each public water system in the event of well or wellfield contamination by such contaminants; and

"(6) include a requirement that consideration be given to all potential sources of such contaminants within the expected wellhead area of a new water well which serves a public water supply system.

"(b) PUBLIC PARTICIPATION.—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 pro-

gram for wellhead areas. Such procedures shall include notice and opportunity for public hearing on the State program before it is submitted to the Administrator.

"(c) DISAPPROVAL.—

"(1) IN GENERAL.—If, in the judgment of the Administrator, a State program (or portion thereof, including the definition of a wellhead protection area), is not adequate to protect public water systems as required by this section, the Administrator shall disapprove such program (or portion thereof). A State program developed pursuant to subsection (a) shall be deemed to be adequate unless the Administrator determines, within 9 months of the receipt of a State program, that such program (or portion thereof) is inadequate for the purpose of protecting public water systems as required by this section from contaminants that may have any adverse effect on the health of persons. If the Administrator determines that a proposed State program (or any portion thereof) is inadequate, the Administrator shall submit a written statement of the reasons for such determination to the Governor of the State.

"(2) MODIFICATION AND RESUBMISSION.—Within 6 months after receipt of the Administrator's written notice under paragraph (1) that any proposed State program (or portion thereof) is inadequate, the Governor or Governor's designee, shall modify the program based upon the recommendations of the Administrator and resubmit the modified program to the Administrator.

"(d) FEDERAL ASSISTANCE.—After the date 3 years after the enactment of this section, no State shall receive funds authorized to be appropriated under this section except for the purpose of implementing the program and requirements of paragraphs (4) and (6) of subsection (a).

"(e) DEFINITION OF WELLHEAD PROTECTION AREA.—As used in this section, the term 'wellhead protection area' means the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield. The extent of a wellhead protection area, within a State, necessary to provide protection from contaminants which may have any adverse effect on the health of persons is to be determined by the State in the program submitted under subsection (a). Not later than one year after the enactment of the Safe Drinking Water Act Amendments of 1986, the Administrator shall issue technical guidance which States may use in making such determinations. Such guidance may reflect such factors as the radius of influence around a well or wellfield, the depth of drawdown of the water table by such well or wellfield at any given point, the time or rate of travel of various contaminants in various hydrologic conditions, distance from the well or wellfield, or other factors affecting the likelihood of contaminants reaching the well or wellfield, taking into account available engineering pump tests or comparable data, field reconnaissance, topographic information, and the geology of the formation in which the well or wellfield is located.

"(f) PROHIBITIONS.—

"(1) ACTIVITIES UNDER OTHER LAWS.—No funds authorized to be appropriated under this section may be used to support activities authorized by the Federal Water Pollution Control Act, the Solid Waste Disposal Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, or other sections of this Act.

"(2) INDIVIDUAL SOURCES.—No funds authorized to be appropriated under this section may be used to bring individual sources of contamination into compliance.

"(g) IMPLEMENTATION.—Each State shall make every reasonable effort to implement the State wellhead area protection program under this section within 2 years of submitting the program to the Administrator. Each State shall submit to the Administrator a biennial status report describing the State's progress in implementing the program. Such report shall include amendments to the State program for water wells sited during the biennial period.

"(h) FEDERAL AGENCIES.—Each department, agency, and instrumentality of the executive, legislative, and judicial branches of the Federal Government having jurisdiction over any potential source of contaminants identified by a State program pursuant to the provisions of subsection (a)(3) shall be subject to and comply with all requirements of the State program developed according to subsection (a)(4) applicable to such potential source of contaminants, both substantive and procedural, in the same manner, and to the same extent, as any other person is subject to such requirements, including payment of reasonable charges and fees. The President may exempt any potential source under the jurisdiction of any department, agency, or instrumentality in the executive branch if the President determines it to be in the paramount interest of the United States to do so. No such exemption shall be granted due to the lack of an appropriation unless the President shall have specifically requested such appropriation as part of the budgetary process and the Congress shall have failed to make available such requested appropriations.

"(i) ADDITIONAL REQUIREMENT.—

"(1) IN GENERAL.—In addition to the provisions of subsection (a) of this section, States in which there are more than 2,500 active wells at which annular injection is used as of January 1, 1986, shall include in their State program a certification that a State program exists and is being adequately enforced that provides protection from contaminants which may have any adverse effect on the health of persons and which are associated with the annular injection or surface disposal of brines associated with oil and gas production.

"(2) DEFINITION.—For purposes of this subsection, the term 'annular injection' means the reinjection of brines associated with the production of oil or gas between the production and surface casings of a conventional oil or gas producing well.

"(3) REVIEW.—The Administrator shall conduct a review of each program certified under this subsection.

"(4) DISAPPROVAL.—If a State fails to include the certification required by this subsection or if in the judgment of the Administrator the State program certified under this subsection is not being adequately enforced, the Administrator shall disap-

prove the State program submitted under subsection (a) of this section.

"(j) COORDINATION WITH OTHER LAWS.—Nothing in this section shall authorize or require any department, agency, or other instrumentality of the Federal Government or State or local government to apportion, allocate or otherwise regulate the withdrawal or beneficial use of ground or surface waters, so as to abrogate or modify any existing rights to water established pursuant to State or Federal law, including interstate compacts.".

APPENDIX II

Ground-Water Portions of House/Senate Conference Committee Report on the Safe Drinking Water Act Amendments of 1986 (House Report 99-575)

SECTION 203—SOLE SOURCE AQUIFER DEMONSTRATION PROGRAM

Senate bill.—The Senate bill establishes administrative procedures for the development, implementation, and assessment of demonstration programs designed to protect ground water resources within designated sole source aquifer areas.

The Administrator is required, within 16 months of enactment, to establish criteria for identifying "critical aquifer protection areas" within sole source aquifer areas designated under Section 1424(e) of the Act by the date of enactment.

Any government or any planning entity that identifies a "critical aquifer protection area" over which it has authority or jurisdiction may apply to the Administrator for the selection of such area for a demonstration program.

The provision establishes specific elements that are to be included in such application. The Administrator must approve or disapprove the application within 120 days of receipt. Upon approval of an application, the Administrator may enter into a cooperative agreement with the applicant to establish a demonstration program and may provide, on a matching basis, a grant of 50 per cent of the costs of developing and implementing the plan.

An annual authorization of $20,000,000 is provided for grants for fiscal years 1987-1990. The total amount of grants for any designated sole source aquifer in a fiscal year shall not exceed $4,000,000.

Each State participating in the program is required to submit a report to the Administrator no later than December 31, 1989, assessing the impact of the program. No later than September 30, 1990, the Administrator is required to submit a report to Congress summarizing State reports and assessing the accomplishments of the sole source aquifer demonstration program.

House amendment.—The House amendment establishes procedures for the development and implementation of a protection program for any aquifer designated as a sole or principal source aquifer under section 1424(e) of the Act. Upon designation of a sole or principal source aquifer, any municipality within the area may initiate proceedings for the designation of a "special protection area" within such area by petitioning the Governor to apply to the Administrator for such designation. A petition must contain hydrogeologic and other information specified in the provision.

If the Administrator approves the petition, the Administrator is authorized to provide to the State, on a matching basis, a grant of 50 percent of the costs incurred in preparing the petition and developing the plan. After such approval, the planning entity is directed to prepare a comprehensive management plan for the special protection area. Plans are required to include thirteen elements specified in the House bill. The Administrator is authorized to provide to the State a matching grant of 50 percent of the costs of implementing the plan (60 percent in the case of an aquifer serving a population of 10,000 or less).

The amendment also prohibits the disposal of solid waste over the unconsolidated Quarternary aquifer in the Rockaway River Basin, New Jersey, currently designated as a sole or principal source aquifer under section 1424(e) of the Act, or the recharge zone or streamflow source zone of that aquifer.

Conference agreement.—The Conference agreement adopts a provision combining the House and Senate language with modifications.

The provision establishes procedures for the development, implementation, and assessment of demonstration programs designed to protect critical aquifer protection areas located within areas designated as sole or principal source aquifers under section 1424(e) of the Act. A critical aquifer protection area is defined as: (1) all or part of an area located within an area for which an application or designation as a sole or principal source aquifer (pursuant to sec-

tion 1424(e)) has been submitted and approved by the Administrator not later than 24 months after the date of enactment and which satisfies the criteria established by the Adminstrator; and (2) all or part of an area which is within an aquifer designated as a sole source aquifer, as of the date of enactment of these amendments, and for which an areawide ground water quality protection plan has been approved under section 208 of the Clean Water Act prior to such enactment.

Any State, municipal or local government or political subdivision thereof or any planning entity that identifies a critical aquifer protection area over which it has authority or jurisdiction may apply to the Administrator for the selection of such area for a demonstration program. Applicants, other than the Governor, shall submit an application jointly with the Governor.

The Administrator is required to establish criteria, not later than one year from the date of enactment, for identifying "critical aquifer protection areas." In establishing such criteria, the Administrator shall consider a number of specified hydrogeologic, economic, social and environmental factors.

An application submitted to the Administrator by any applicant is required to: (1) propose boundaries for the critical aquifer protection area within its jurisdiction; (2) to designate a planning entity to develop a comprehensive management plan for the critical protection area; (3) establish procedures for public participation; (4) include a hydrogeologic assessment of surface and ground water resources within the critical protection area; (5) include a comprehensive management plan for the proposed protection area; and (6) include the measures and schedule proposed for implementation of such plan.

The provision specifies elements to be included in a protection plan, the objective of which should be to maintain the quality of the ground water in the critical protection area in a manner reasonably expected to protect human health, the environment and ground water resources. There are a number of additional elements specified that states may choose to include in a plan to meet this objective.

Within 120 days after receipt of an application under this section, the Administrator must approve or disapprove the application based on a determination that the critical protection area satisfies the established criteria and that a demonstration program for the area would provide protection for ground water quality consistent with the stated objectives.

Upon approval of an application, the Administrator may enter into a cooperative agreement with the applicant to establish a demonstration program and provide to the applicant, on a matching basis, a grant of 50 per cent of the costs of implementing the plan. The Administrator may also reimburse the applicant of an approved plan up to 50 per cent of the costs of developing a plan, except for plans approved under section 208 of the Clean Water Act. The total amount of grants under this section for any one aquifer, designated under section 1424(e), shall not exceed $4,000,000 in any one fiscal year.

No funds authorized under this subsection may be used to fund activities funded under other sections of this Act or the Clean

Water Act, the Solid Waste Disposal Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 or other Federal environmental statutes.

States are required, not later than December 31, 1989, to submit to the Administrator a report assessing the impact of the program on ground water quality and identifying those measures found to be effective in protecting ground water resources. No later than September 30, 1990, the Administrator is required to submit to Congress a report summarizing the State reports, and assessing the accomplishments of the sole source aquifer demonstration program.

The provision establishes that nothing under this section is to be construed to amend, supersede or abrogate rights to quantities of water which have been established by interstate water compacts, Supreme Court decrees, or State water laws; or any requirement imposed or right provided under any Federal or State environmental or public health statute.

SECTION 204—EMERGENCY POWERS

Senate bill.—The Senate bill has no provision.

House amendment.—The House amendment provides that if the Administrator or the delegated State enforcement authority determines that any person has caused or contributed to the presence of any contaminant that may adversely effect the health of persons in any sole or principal source aquifer (designated under section 1424(e)), which supplies or can be expected to supply a public water system, then either authority may issue an order requiring such persons to provide adequate supplies of potable drinking water to the persons served by the public water system. Provisions for judicial review of such orders and civil penalties are also established.

Conference agreement.—The conference agreement changes the House language to clarify the Administrator's existing authority to take such action as deemed necessary upon receipt of information that a contaminant, which is present in or is likely to enter a public water system or underground source of drinking water, may present an imminent substantial endangerment to the health of persons and that appropriate State and local action have not been taken. Such action may include orders requiring the provision of alternative water supplies by persons who caused or contributed to the endangerment.

SECTION 205—STATE PROGRAMS TO ESTABLISH WELLHEAD PROTECTION AREAS

Senate bill.— The Senate bill has no provision.

House amendment.—The House bill requires States to submit to the Administrator a comprehensive plan to protect current and potential sources of drinking water within three years of the date of enactment.

Each plan must: (1) specify the agency responsible for implementing the plan; (2) identify each underground source of drinking water in the State and describe the characteristics of each source; (3) describe the location and types of human development which affect each source; (4) set out the regulations and other measures (including best management practices) for activities that may con-

taminate sources; and (5) guarantee or provide for an alternative drinking water supply when an underground drinking water source is contaminated.

Each State is to make every reasonable effort to implement the State plan under this section within two years of its adoption. Within two years after the approval of each State plan under this section, each State is to submit to the Administrator a status report describing the State's progress in implementing the plan.

A State that has not complied with the requirements of this section may not receive assistance for its underground injection control program established under the Act.

Conference agreement.—In a new Section 205, the conference modifies the House provision and requires each State to submit a program within three years to protect wellhead areas within its jurisdiction from contaminants that may have any adverse effect on the health of persons. The purpose of such programs is to protect underground drinking water supplies from such contamination.

Each program must: (1) specify the duties of State and local agencies and public water systems with respect to the development and implementation of programs; (2) determine the wellhead projection area based on all reasonably available hydrogeologic information on flow, recharge and discharge and other information the State deems necessary to adequately determine the area; (3) identify within each protection area all potential anthropogenic sources of contaminants which may have any adverse effect on the health of persons; (4) describe a program that contains, as appropriate, technical or financial assistance, implementation of control measures, education, training and demonstration projects to protect the water supply within wellhead protection areas; (5) include contingency plans for locating and providing alternate drinking water supplies in the event of contamination of a water supply; and (6) require consideration of all potential anthropogenic sources of contaminants within the expected wellhead area of a new water well.

A wellhead protection area is defined as the surface or subsurface area, surrounding a water well or wellfield supplying a public water system, through which contaminants are likely to move toward and reach the well or wellfield. The State is to determine the extent of the wellhead protection area so as to provide protection from contaminants that may have any adverse effect on the health of persons.

Within one year of enactment, the Administrator is to provide technical guidance that the States may use to determine the protection area. The guidance is to reflect factors affecting the likelihood of contaminants reaching the well or wellfield.

Each State has the responsibility for defining the wellhead protection areas within that State as required by the definition in this section. This section does not, however, limit the existing authority of States to manage, regulate, protect, or identify groundwater resources. A State may, in its discretion, identify areas of significant recharge not contiguous to a well or wellfield in defining a wellhead protection area under this section.

With respect to identification of sources of contamination within the protection area, the term "anthropogenic sources" means those sources resulting directly or indirectly from human activities.

Therefore, State inventories of potential sources of contamination should include those sources that are man-made and contribute primarily man-made contaminants and those sources created by human activities that result in the concentration and movement of naturally-occurring contaminants in or toward a well. Specifically, however, the mere drawing down of water in a well should not be considered an "anthropogenic source".

Each State has the responsibility of determining how best to describe a program to protect the water supply within each protection area in the State. The provision is structured to afford States maximum flexibility in formulating a protection strategy. A State is not required to develop a regulatory program unless it chooses to do so; a program incorporating one or more of the following elements—technical and financial assistance, education and training, and demonstration projects—could be determined by a State to achieve the required protection.

States can be expected to take a wide variety of approaches to protection of wellhead areas within their jurisdiction, and it is conceivable that each State could develop its own unique approach. Protection strategies may also vary for different protection areas within one State. The amendment recognizes that States are best able to assess specific problems within their jurisdictions, and to develop and implement necessary protection measures. As a result, no groundwater classification assigned by the Administrator is to lessen the level of protection assigned to an aquifer by the State in a wellhead protection area.

The Administrator is granted authority to disapprove a State's program if it does not include one or more of the required enumerated elements and is, therefore, not adequate to protect public water systems as required by this section. If after nine months, the Administrator has not disapproved a program, it will be deemed to be approved.

Because of the important State role in protecting groundwater, the Administrator's disapproval authority should be used judiciously. In the event a program is disapproved, the Administrator must submit to the Governor a written statement of the reasons for disapproval, and the State must modify and resubmit the program within six months.

The penalty for failure of a State to have an approved program is that the State will not be eligible for Federal funds to implement the program, beginning three years after enactment. This is the only penalty for failure to develop an adequate plan.

Federal agencies having jurisdiction over any potential source of contaminants identified by a State program must comply with all applicable requirements of the State program, including payment of reasonable charges and fees, in the same manner and to the same extent as any other person. The President may exempt individual sources after determining it to be in the paramount interest of the United States to do so, but no exemption can be made because of a lack of funds unless the President requested adequate funds and Congress failed to appropriate them. This provision is not intended to modify or alter obligations and responsibilities under other Federal or State laws. Moreover, it cannot operate to

waive or limit more stringent requirements established under such other laws.

An additional requirement of this section applies to any State in which there are more than 2500 active wells at which annular injection of brines associated with oil or gas production, is used as of January 1, 1986. Any such State must include in its program a certification to the Administrator that a State program exists and is being adequately enforced that provides protection from contaminants which may have any adverse effect on the health of persons and which are associated with the annular injection or surface disposal of brines associated with oil and gas production. The Administrator's review under this provision is to assure that the required certification is submitted by the State and to assure, on the basis of existing information reasonably available to him, that the program is adequately enforced. Such review should be limited to the question of certification and enforcement and will not affect separate determinations under this Act, such as the granting of primacy to a State under the UIC program. Brine presents the most significant problem in the State of Ohio, which has older oil and gas-producing wells. As the product depletes, brine makes up a higher proportion of the fluid pumped and so creates a more pressing disposal problem. This provision, therefore, is particularly aimed at Ohio, which has proven to be remiss in its enforcement of brine-related problems.

The conference substitute clarifies that nothing in this Act authorizes or requires activity by any government entity which would alter existing water rights or priorities. While not authorizing or requiring any such government activity, neither does it limit the existing authority of States to manage, regulate, protect, or identify groundwater resources within their jurisdiction.

In order to assure that the monies authorized to be appropriated under this section are directed toward making state groundwater protection efforts as effective as possible, the conference substitute states that such funds cannot be used to support activities under other Federal Acts or other sections of this Act.

DATE DUE	
OCT 19 2001	ILL# 9371 461221 ELA